Learning Outcomes from Online Learning in Malaysia: A Case Study on Students' Perception of Satisfaction, Perception of Interaction and Perceptions of Individual Features of Online Learning

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Abstract

This paper reports the results of a study concerning of Malaysian undergraduate science physics students' and pre-service science teachers' perceptions of learning through online learning. Specifically, it required to ascertain whether students had positive perceptions of the new teaching and learning medium. 102 students were involved in this study which consists of 61 students from the School of Science and Technology (SST, science student) and 41 students from the School of Education and Social Development (SESD, pre-service science teachers). Both programmes were offered in University Malaysia Sabah. The students then followed all learning activities for sixteen weeks through online (i.e., N=50, PBL approach; N=52, traditional approach). The online learning environment (i.e., learning management system, LMS) was used as the main medium to carry the full learning process throughout the second semester of 2008/2009 academic year. Data gathered from an established open-ended questionnaire with 5 Likert Scale that administered after they completed with the learning activities at the end of the semester.Students' perceptions after experiencing the online learning were analysed into three main themes: students' perception of satisfaction; perception of interaction; and perceptions of individual features of online learning, and the main purpose was to seek the difference between PBL online and the traditional online learning approach. As the conclusion, student that exposed in PBL online shows positive perceptions in all three themes as compared to traditional approach. Thus, it suggests that some of the PBL'selement did contribute to the students' satisfaction where they made a meaningful interaction and developed some individual features.

Keywords: learning outcomes; online learning; perception of satisfaction; perception of interaction and perceptions of individual features of online learning.

Introduction

Online learning is comparatively new in University Malaysia Sabah (UMS). Though in early 2000, UMS has been introduced with an electronic teaching aid such as Blackboard and several computer aided instruction as one of the teaching and learning tool, both from School of Engineering and Information Technology (SEIT) and School of Education and Social Study (SESD), until now the usage of these teaching aid seems not been utilised at all or at least part of it. In School of Science and Technology (SST), a very small number of lecturers prefer to use online learning as the teaching and learning medium or at least part of it. They were really comfortable with the existing medium (i.e., face-to-face lecture based) as to deliver course syllabus and content objective throughout semester. Ironically Malaysian government through the 9 challenges in Vision 2020 that must be achieved in order to be a well-developed, advanced and higher income country in 2020 had stated through the 6th challenge that Malaysian citizens must try to adapt with these cutting edge technology and must also contribute to the science and technologies civilizations. Additionally our Prime Minister also stated the Information Communication Technology (ICT) and education service are two main key of the National Key Economic Area (NKEA), thus must be utilised very well in our daily life scenario to ensure the higher income economically and productivity country objectives can be achieved (Razak, 2010). Therefore as a rapid develop country, Malaysia really need to explore the potentials of these NKEA especially in higher leaning institution in order to reply the Prime Minister's call.

Media & Educational Technology Unit (METU) was then established in UMS to ensure the nation's vision and mission in higher education particularly in UMS can be achieved. The main objective for METU is to cater the service and facilities in Information Communication and Technology (ICT) such as computer and software component to the university including the teaching and learning aspects, besides it is also deliver digital information across all academic disciplines for research, administration and management of the university activities (Media & Educational Technology Unit, 2012).

Therefore this preliminary research was to address an issue concerning about online learning and what was really happen when the online learning being implemented in UMS. It's critical for researchers to considerate many factors before implementing online learning fully. As stated by Kiśićek, Lauc and Garić(2012) understanding students' preferences can guide to a better learning instruction through online. Additionally the use of ICT in modern teaching aid (e.g., internet technologies; web portals; and multimedia software) contribute positive output to parts of teaching and learning process such as, cooperation amongst students and the learning becomes more interactive (Mandic, Dzinovic, & Samardzic, 2012). It also might be one of the powerful tools to lesser lectures' teaching workload. Thus, though the students in this research had been intervened with a different approach (i.e., Problem-based learning, PBL) from the current conventional practice, it was the online learning aspect was the main issue. The main objective was to bring a different way of learning approach compare to the current practice (i.e., face-to-face pedagogy). Thus the researcher took stepsintegrated online learning in a particular physics course. Students' perceptions after experiencing the online learning were analysed into three main themes: students' perception of satisfaction; perception of interaction; and perceptions of individual features of online learning, and the main purpose was to seek the difference between PBL online and the traditional online learning approach will be evaluated.

Methodology

The study was conducted throughout Semester II during the 2008/2009 academic year at University Malaysia Sabah (UMS), Malaysia. One hundred and two students were involves, which consist of sixty-one science physics students from Physics With Electronic Programme at the School of Science and Technology (SST), and another forty-one pre-service science teacher from Science Education Programme at the School of Education and Social Development (SESD). The samples pursued all the learning activities in an online learning environment (i.e., learning management system, LMS) which acted as the main medium to support the full learning process throughout the semester. The flow of group sample shows in Figure 1.
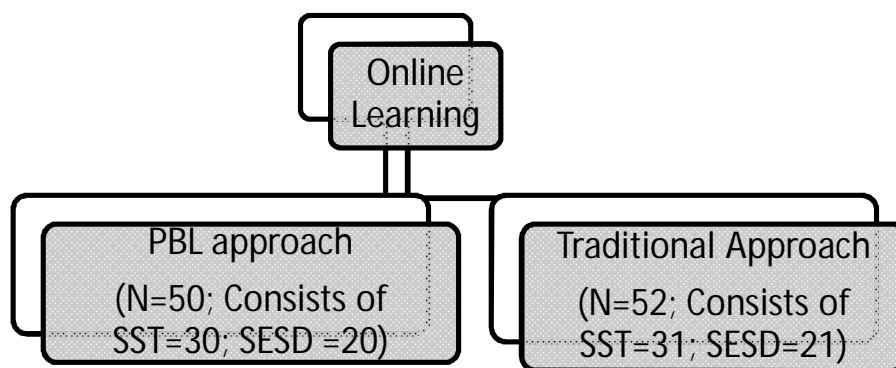
Figure 1: Group Sample for the Study

The teaching and learning via online was conducted within 16 weeks. During this intervention, all assessment being delivered using the LMS organised by Educational Technology and Multimedia Unit (ETMU) at the university. The researcher prepared the LMS followed the PBL and traditional criteria to fulfilled the learning and teaching activities via online.For PBL, the learning activities started with problems. After they encounter with the problem, they have to find their own information, knowledge and sources in order to find the appropriate solution. They can either find the solution via Internet, interview lectures or tutors, from text books, observation or any other methods in sequence to find adequate information to solve their problems. The students in PBL group also have to access to the LMS to do their chat room at least once in a week and monitored by a facilitator.

In this chat room they will argue, share thoughts and most probably constructed their own thinking regarding to the particular problems. They also have the right and access to enter the forum room to post any inquiries or any ideas asynchronously. Additionally some linkages, sources and lecture note also uploaded by the facilitator for them just to ensure the students did not lose their ways in sequence to find the suitable solution and just to give them the correct path in searching their resource. They had been given two weeks for each problem to solve before passing up, and there were five problems need to be solved throughout the semester. This LMS system was using Moodle2007 course management systems. Jayasundara et al. (2007) suggested that the PBL online service and implementation rate of system perhaps more improve and even better if it is incorporated with existing course management systems such as Moodle2007 and Blackborad2007. The LMS was using the same software.

In this study the intention was to investigate Malaysian Undergraduate Science Physics Students' (SST) and Pre-Service Science Teachers' (SESD) perceptions of online learning after being intervened with two different approaches, The PBL and the traditional approach. The three main themes being evaluated were: *students' perception of satisfaction; perception of interaction; and perceptions of individual features of online learning.* The main purpose was to seek the difference between PBL online and the traditional online learning approach for both SST and SESD group of students.The data were collected through a well-developed survey which has α = 0.81 Cronbach's Alpha. The survey was filled one week after their finish with the intervention.

Findings

The results shown in Table 1 suggest that, overall, the PBL students' perceptions of learning online were more positive than the traditional group in three broad categories*: students' perception of satisfaction*; *students' perception of interaction*; *student's perceptions of individual features of online learning as a communication tool* (except for Statement 38: *I would rather do an assignment than a discussion*), and *Student's Perceptions of Individual Features (Online Student Assessment)* (except for Statement 47: *I prefer taking my tests, quizzes and exams on paper rather than online*).

In the other two categories, *Student's Perceptions of Individual Features (Content Available on the Online Course),* and *Assignment,* for the majority of the statements there were no great differences between the groups, except for Statement 19: *I was satisfied with the content available on this online web-course*and Statement 25: *I found the calendar section of the LMS Website a valuable resource* under the*Content available on the online course* category, where the PBL group reported higher means.

Table 1Comparison in general of undergraduate science students and pre-service science teachers' perceptions of online learning: PBL and Traditional

No	Statement	[PBL/Traditional] Mean (SD)	Z [Asymp. Sig. (2-tailed)]	t [(df=100) [Sig. (2-tailed)]
Students' Perception of Satisfaction				
1	I was satisfied with the overall experience of online learning.	[3.94(0.64)/3.35(0.62)]	-4.25(0.00*)	-4.66(0.00*)
2	I enjoy the portion of the course on online learning.	[3.88(0.76)/3.33(0.53)]	-4.23(0.00*)	-4.25(0.00*)
3	The online learning portion stimulated my desire to learn.	[4.08(0.47)/3.35(0.52)]	-6.48(0.00*)	-7.38(0.00*)
4	I was satisfied with online learning in regards to the quantity (knowledge input) of my learning experience.	[3.96(0.63)/3.36(0.60)]	-4.41(0.00*)	-4.99(0.00*)
5	I was satisfied with online learning in regards to the quality (knowledge input) of my learning experience.	[3.97(0.59)/3.20(0.56)]	-5.59(0.00*)	-6.77(0.00*)
6	The online learning component of this course allowed for social interaction.	[3.97(0.66)/3.51(0.67)]	-3.59(0.00*)	-3.53(0.00*)
7	Online learning provided a reliable means of communication with other group members.	[4.08(0.65)/3.66(0.68)]	-4.80(0.00*)	-3.17(0.00*)
8	Online learning provided a reliable means of communication with facilitator/lecturer.	[3.45(0.82)/3.44(0.50)]	-0.16(0.88)	-0.11(0.92)
9	I found the online learning course to be a helpful resource.	[3.96(0.60)/3.69(0.59)]	-3.10(0.00*)	-2.30(0.02*)
10	I used the online learning to help me understand course information.	[4.02(0.56)/3.60(0.60)]	-4.08(0.00*)	-3.72(0.00*)
11	I regularly used online learning to answer my questions to other group members.	[3.81(0.72)/3.06(0.82)]	-3.82(0.00*)	-4.96(0.00*)
12	I believe that online learning enhanced my learning in Modern Physics course.	[3.97(0.72)/3.22(0.77)]	-4.37(0.00*)	-5.03(0.00*)
13	I would like to see all of my courses involve at least some online learning.	[3.99(0.68)/3.33(0.80)]	-3.63(0.00*)	-4.48(0.00*)

14	I believe that online learning will play an important role in education in the future.	[4.18(0.64)/4.02(0.85)]	-1.50(0.14)	-1.06(0.30)
	Students' Perception of Interaction			
15	The online learning component of this course helped to create a sense of community among the students in the course.	[4.05(0.70)/3.58(0.64)]	-3.57(0.00*)	-3.51(0.00*)
16	The online learning component of this course increased my interactions with the instructor.	[3.90(0.81)/3.35(0.60)]	-4.28(0.00*)	-3.94(0.00*)
17	The online learning component of this course increased my interactions with my fellow coursemates / classmates.	[4.13(0.71)/3.47(0.67)]	-5.10(0.00*)	-4.85(0.00*)
18	The online learning component of this course extended my personal interactions.	[4.02(0.69)/3.28(0.61)]	-4.80(0.00*)	-5.74(0.00*)
Students' Perceptions of Individual Features (Content Available on the Web Course)				
19	I was satisfied with the content available on this online learning web-course.	[3.76(0.72)/3.30(0.55)]	-3.43(0.00*)	-3.57(0.00*)
20	I was satisfied with the online lectures note included on the course Website.	[3.60(0.74)/3.55(0.80)]	-0.60(0.55)	-0.34(0.74)
21	The online lecture notes on the Learning Management System (LMS) Website were a valuable resource.	[3.71(0.73)/3.70(0.71)]	-0.58(0.56)	-0.06(0.95)
22	The lecture note/finding notes were easy to print.	[3.79(0.64)/3.60(0.79)]	-0.47(0.64)	-1.31(0.19)
23	I like the fact that PowerPoint slides of the lecture notes were available on the LMS Website.	[3.84(0.66)/3.94(0.71)]	-1.50(0.13)	0.73(0.47)
24	I regularly visited the calendar section of the LMS Website.	[3.46(0.85)/3.19(0.76)]	-0.64(0.52)	-1.65(0.10)
25	I found the calendar section of the LMS Website a valuable resource.	[3.81(0.70)/3.49(0.67)]	-1.86(0.06)	-2.38(0.02*)
26	I felt the links contained on the LMS Website were valuable.	[3.68(0.81)/3.47(0.65)]	-1.68(0.09)	-1.47(0.14)
27	I regularly visited the links	[3.51(0.81)/3.19(0.86)]	-1.76(0.08)	-1.93(0.06)

	contained on the LMS Website.			
28	The LMS Website is a great place for the instructor to place handouts.	[3.87(0.76)/3.72(0.79)]	-1.08(0.28)	-0.97(0.34)

Student's Perceptions of Individual Features (Online Learning as a Communication Tool)

29	I e-mailed the instructor through the LMS Website.	[3.49(0.95)/2.97(1.02)]	-3.33(0.00*)	-2.64(0.01*)
30	I regularly checked my mailbox through the LMS Website.	[3.17(0.93)/2.74(0.98)]	-2.10(0.04*)	-2.28(0.03*)
31	I regularly used the discussion section of the LMS Website.	[3.64(0.95)/2.30(0.77)]	-6.42(0.00*)	-7.89(0.00*)
32	I found the discussion section of the LMS Website easy to use.	[3.58(0.90)/2.73(0.89)]	-4.88(0.00*)	-4.78(0.00*)
33	The discussion section of the course content using LMS helps me better understand course content.	[3.75(0.83)/2.72(0.96)]	-5.83(0.00*)	-5.79(0.00*)
34	The discussion section of the course content using LMS is a great way to interact with my fellow classmates.	[3.83(0.75)/3.03(0.90)]	-4.71(0.00*)	-4.89(0.00*)
35	The discussion sections of the course content using LMS is a great way to interact with the facilitator/lecturer.	[3.78(0.58)/3.28(0.83)]	-2.91(0.00*)	-3.55(0.00*)
36	The discussion section of the course using LMS helps me to ask and answer questions more efficiently.	[3.65(0.87)/2.85(0.88)]	-4.55(0.00*)	-4.58(0.00*)
37	I am glad the discussion section of the LMS Website was factored into my final grade. (*for PBL group only*)	[3.80(1.05)/2.90(0.69)]	-5.41(0.00*)	-5.17(0.00*)
38	I would rather do an assignment than a discussion.	[3.27(1.02)/3.22(0.95)]	-0.01(1.00)	-0.26(0.80)

Student's Perceptions of Individual Features (Assignment)

39	I found it easy to submit my assignment online.	[4.13(0.87)/3.91(0.80)]	-1.70(0.09)	-1.32(0.19)
40	I prefer the online submission of assignments.	[4.00(0.94)/3.97(0.78)]	-0.31(0.76)	-0.16(0.88)
41	I found the online submission of assignments simple.	[4.05(0.89)/3.88(0.86)]	-1.35(0.18)	-0.97(0.34)
42	I found the online submission of assignments	[4.08(0.93)/3.97(0.78)]	-0.48(0.63)	-0.63 (0.53)

convenient.

	Student's Perceptions of Individual Features(Online Student Assessment)			
43	I took the online test (critical and creative thinking test).	[4.05(0.73)/3.58(0.72)]	-3.69(0.00*)	-3.24(0.00*)
44	I found taking online tests convenient.	[3.63(1.00)/3.22(0.75)]	-2.40(0.02*)	-2.35(0.02*)
45	I found the test section easy to use.	[3.73(0.83)/3.22(0.73)]	-3.28(0.00*)	-3.31(0.00*)
46	The tests worked during my visit.	[3.55(0.72)//3.22(0.66)]	-1.99(0.05)	-2.37(0.02*)
47	I prefer taking my tests, quizzes and exams on paper rather than online.	[3.66(0.78)/3.38(0.87)]	-1.20(0.23)	-1.68(0.10)

*Note. Traditional (N= 52); PBL (N=50); Total (N=102); (a) Grouping Variable and * Statistical difference (p < 0.05*

Discussion and Conclusion

Every modern university of technology used widely in education computing today. In this paper it seems that although a majority of the students in PBL group were satisfied with their online learning experiences, there were some issues of concern. The main issueseems to be the nature of the online assignment arrangements, and the content available on the Web. These two issues need careful thought in any future iteration. Form the findings, PBL group does not made any difference compare to traditional group online, thus it reflects that students might think that assignment and course content need to be given more to the students through online same as traditional approach. This is different from the PBL's normal activity that the syllabus must be ill-structured and it is the student's responsibility to construct their own learning but will be facilitate by trained facilitator (Sulaiman, 2011). This is in line with work by Mandic, Martinovic, Dejic (2011) suggest that new knowledge's, new inventions and new technologies influence, directly or indirectly, reform and advancement of education system, changes of teaching contents and other sources of knowledge, betterment of teaching technique and technology. Thus some of discoveries which have been influencing the changes of education systems positively should be shared and mentioned.

Moreover Kondratieva (2012) says that regular practice using on-line tutoring system might change students' personal meaning of the learning activity and consequently change students' attitude and work habit to be more serious and determine in their study. Nevertheless, she adds through online training is less influential in terms of other aspects such as raising students' interest in the subject. In other point and view Simonova, Poulova, and Kriz (2011) suggest that material and technical requirements having been satisfied, strong attention must be paid to didactic aspects of instruction. It is essential for a student to be aware of his/her learning style, know what his/her strengths and weaknesses are and be provided a variety of instructional methods to choose the most suitable ones; and the e-application can support the process. In the days of fast technical and technological development, globalization, demand for further, lifelong education, the importance of education is increasing.

As a conclusion, online learning has become a common expression in higher institution of university education these days, Malaysia also is not exempted. If applied appropriately, it contributes to increasing the efficiency of the educational process, decreasing the amount of face-to-face instruction and strengthening the dimension of self-study and project activities, and thus it contributes to the process of developing students' key competences. Therefore this paper gives some positive description on how students' acceptance toaconstructivist approach play its part in conveying learning process compare to traditional approach via online. It suggests that some of the PBL's element did contribute to the students' satisfaction where they made a meaningful interaction and developed some individual features. However further research need to be done particularly in a concrete PBL online structure thus can really contribute to students' satisfaction and may create a better environment of learning.

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