

The use of learning technologies to facilitate engagement in an online course

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Abstract:

E-learning is becoming increasingly popular in many countries for its flexibility in terms of time, place and pace. Research affirms that learning technologies support interaction and collaboration among learners and improve learning outcomes. However, current practices of e-learning are not without constraints and there is a need for empirical research to assist practitioners in determining the best uses of learning technologies. This paper seeks to develop an understanding of students' experiences and their perspectives of learning with the educational technologies of 'Adobe virtual classroom' and 'Moodle' that facilitated activities in a university course. The study was conducted using a case study method over a period of one semester. With Activity Theory as its research framework, the research methods of this study include individual interviews, online observation and document analysis. This paper includes some of the initial findings of the research and a brief discussion on how the educational technologies facilitated students' engagement in this course. This may inform practitioners of the pragmatic constraints and affordances of existing technologies, learning activities and strategies used in online learning environments.

Keywords-component; *learning technologic; engagement; e-learning; affordances; constraints; Activity Theory*

I. INTRODUCTION

E-learning is becoming increasingly popular in many countries for its flexibility in terms of time, place and pace. Research affirms that learning technologies support interaction and collaboration among learners and improve learning outcomes. Studies that examine how technology can be used in educational contexts have focused on potential benefits of learning technologies in relation to teaching and learning. For instance, Holmes and Gardner [2] assert that e-learning offers unique opportunities for teachers and learners to enhance their teaching and learning experiences via virtual environments that help not only in delivery but also in the application of knowledge.

In addition to the pedagogical potential of e-learning, some researchers have focused on the changes that are taking place with the emergence of e-learning. The shift from teacher-centred learning to student-centred learning in various contexts [1][7] and also the way students learn and interact in learning environments [6] are some of these changes. For instance, access to information regardless of time and place enables learners to 'explore education' and communicate with peers and the outside world through various media ranging from print to video [6].

In the context of New Zealand, The Ministry of Education stresses the importance of e-learning in education. According to NZCER [7] “E-learning can improve understanding and encourage deeper learning, if there is careful course design and choice of technology in relation to learning objectives that aim to encourage deeper learning”. As suggested by the e-learning Advisory Group [3], technology does not offer a complete solution for a transformative education; rather the practitioners should focus on the potentials of learning technologies that can enhance students’ learning experience and performance as well as the constraints of these technologies that inhibit their performance. These affordances and constraints of technologies in education should be thoroughly considered for a successful implementation of e-learning.

This paper seeks to develop an understanding of students’ experiences and their perspectives of learning with the technologies –Adobe virtual classroom and Moodle that facilitated activities, and how these technologies facilitated students’ engagement in a fully online university course. This study defines learner engagement as students’ active participation in e-learning activities such as discussion forums and virtual classroom activity in achieving learning goals in an online environment.

II. RESEARCH CONTEXT AND RESEARCH QUESTIONS

This paper is based on a case study focused on a fully online course that was offered in the first semester of 2012 academic year. A total of seven participants that comprised six students and their lecturer participated in this study. The research questions that guided the data collection and analysis of this research were:

- What were students’ perspectives on their experiences of learning with Adobe virtual classroom and Moodle learning technologies that facilitated activities in a fully online university paper?
- How did the educational technologies affect students’ participation in e-learning activities?

III. RESEARCH FRAMEWORK, METHODS AND DATA ANALYSIS

This study was carried out as a case study over a period of one semester and the methods of data collection included individual interviews, observation of online activities and document analysis. The online learning activity was the focus of data gathering and Engeström’s [10] Activity Theory was used as the research framework.

Activity Theory is derived from socio-cultural and socio-historical theories and can be considered as a philosophical framework that is used to study practices and processes of human beings [4]. Particularly, Engeström’s activity systems analysis enables researchers to observe the interactions that take place among individuals and the environment and how each affects one another [5]. The elements of an activity system include *subject*, *object* and other mediators such as *tools*, *rules*, *community* and *division of labour*.

In capturing participants' views on how these educational technologies facilitated students' engagement, particular attention was given to the *tool mediation* principle of Activity Theory- that is human activity is mediated by several tools [9]. These *tools* can be physical—a computer or a book, conceptual– a mental model, a plan or a strategy, abstract— a language, or even a virtual tool— functions of a website. Mediation of tools plays an important role in shaping how human beings act and interact with the world [8]. Focusing on the *tool mediation* tenet of Activity Theory, the sub-themes that emerged under the element *Tools* were mainly considered for the analysis. In the case of this paper, *tool mediation* refers to the use of Adobe virtual classroom that facilitated a synchronous activity in which students presented their research to the members of the class, and the Moodle learning management system that facilitated an asynchronous online forum activity in this course.

In coding data, relevant units from transcribed interview texts, observational notes and documents (i.e. course outline) were identified and categorized according to the elements of Activity theory as a method of typology. In categorizing these codes according to the elements of Activity Theory, Nvivo was used as a data management tool.

IV. FINDINGS AND DISCUSSION

The activities observed and used in the analysis of data included Adobe virtual class that facilitated a synchronous activity and Moodle that facilitated asynchronous forum discussions as well as the design and the delivery of the contents of the course. Thus, the findings that are related to these educational technologies and other tools that mediated students' engagement in activities in this course are illustrated in the following sections.

A. *The Adobe virtual classroom*

The Adobe Connect Pro virtual classroom that was used as the tool in facilitating the collaborative synchronous activity in this class was a web-based technology. This activity was carried out as an individual assignment and represented 30% of the student assessments. In order for students to access it, a unique URL and a password was provided by the lecturer.

In placing the Adobe virtual classroom activity in Activity Theory framework, the *subject* represents the student(s) who are the focus of this study. The *object* is the purpose of an activity which can be a motive or a problem space. In this case, the students' purpose was to present their research to an audience (other members of the class). The *mediating tools* that were used in this activity in order to transform students' object include physical tools- computers, mental tools- learning strategies, models and virtual tools- functions that were available on Adobe virtual classroom. The *rules* for this activity included the duration of the presentation (10 minutes), relevant literature and references (following APA format) and a written script or notes (1500 words). The *community* of this activity includes the facilitator who is also the lecturer of this course and the members of the class. *Division of labour* defines the students' responsibilities. As part of their responsibilities, one peer had to review the allocated student's presentation and the notes before the actual activity and also the peer was to raise three questions to be discussed after the presentation.

The findings suggest that the students' experiences of learning with Adobe virtual classroom were associated mainly with the affordances and constraints of this learning technology. As pointed out by the participants, the affordances of the Adobe virtual class allowed them to interact in real time. Denoting the value of synchronous tools that enable them to see and hear each other in real time and the immediate responses they receive when they engage in collaborative activities, Alex suggested that:

I would like to see more synchronous. Only because I like seeing people when I'm talking to them and stuff like that. I like that backwards and forwards that can happen very easily in that environment (Alex, interview 2)

Students also pointed out that the visual images are important in communication and without them, they probably find it quite hard to feel like they belonged to a learning community.

Another feature of virtual classroom that supported students' engagement was the ability to have an oral discussion in real time right after each presentation. It was observed that having a discussion after each presentation allowed the students to clarify the issues related to the topic immediately, as well as provide some instant peer feedback. When Alex was asked what he thought about the reviewing of notes and facilitating a discussion after each presentation, he stated that *"I think it caused us slightly deeper interaction with what the others have done. I thought that was quite useful"* (Alex, interview 2). As a group, students could also support each other by giving words of encouragement after their presentations, for example *"very interesting"*, *"well-done"* and *"excellent presentation"*. These video and audio features facilitated two way communications among the students and thereby created a sense of belonging to a learning community.

Apart from the video and audio functions, Adobe virtual class also allowed the students to have a text-based chat during this activity. This was particularly useful when they had questions to ask from a particular person in private or in public as well as to have a chat before the facilitator (lecturer) joined the group. An example of a text-based chat is shown below.

Debbie: Why am I coming up as guest?

Debbie: you must have heard me

Alex: Hi Debbie - you've come in as Guest, if you close out and come back in you should get the chance to put in your name. I'm backing you, so I hope your nervousness isn't too bad

Alex: All the different styles make it interesting :) imagine if they were all the same :(

Alex: Hi Debbie - not sure why that didn't work... I'll investigate

Debbie: I've just tried coming in again but I don't see a guest tag now

Alex: It has remembered you and brought you back in as Guest again - maybe Richard can tell you how to fix that

Richard: Debbie - quit your browser and re-enter with your name and not guest

Alex: Hi Debbie - did you hear that

Debbie: Yes

(7 May observation)

On the other hand, students also felt that there were limitations with the Adobe virtual classroom. Students mentioned that they were attracted to this course for its flexibility, as it was fully online and enabled them to have flexibility in terms of time, place and pace. However, as Richard, the lecturer pointed out, the inclusion of synchronous activities like the research presentations using Adobe virtual classroom needs careful planning in terms of time, as some of the students come from different countries and when the time zones are different, it is hard to coordinate synchronous activities. On that particular day and at that particular time if the internet connection is not stable, the students may not be able to participate in the activity. This was evident in the case of Gail who participated from a Middle Eastern country. Due to slow speed internet connection that was caused by an unstable political situation in the country, Gail couldn't hear what the others were saying and also she couldn't do her presentation or facilitate and join discussions. Although Richard gave her a one-to-one session to present her research via Skype the next day, it was a disappointing and frustrating experience for her. Richard described that:

I had her notes and I had her PowerPoint slides and I also had a Skype conversation with it. The issue was there, the bombs are going outside the window and probably it had something to do with it, but from her point of view, it was frustrating because she had prepared and she did a good job (Richard, interview 2).

This suggests that although online courses provide more flexibility to learners and the ability to interact with each other in real time, synchronous activities like Adobe virtual classroom need careful planning in its implementation especially with back up plans, as unexpected situations like weather conditions and technical issues can hinder the execution of activities.

The findings indicated another significant limitation of this tool is that if the number of students is high, it gets harder to allocate time slots. As Richard said, *“the more students you have the harder it is. Also how many times you have to do it”* (interview 2). Considering the constraints of Adobe virtual classroom Richard appeared to be unsure of its best use and he mentioned that *“in using Virtual classroom as I'm using it moreas I go along.....I am still little bit unsure about its best use* (Richard, interview 1). Participants' views also suggested that having limited capacity for only one speaker to talk at a time, discussions take a longer time and also the participants may have to repeat their utterances many times if two people talk at the same time.

However, it was interesting to find out that students still preferred more synchronous activities despite its limitations because the students could have more *“human interactions”* where they could use *“a lot of cues”* (Alex, interview 2) like facial expressions as well, as it allowed the participants to interact with each other in real time that enabled them to have a two way communication. In Eddy's point of view *“if there was a little more any form of synchronous...it may have helped get to know one another earlier on* (Eddy, interview 2). Alex pointed out that although the virtual classroom *“wasn't flowing more like we can talk like we would be sitting in front of each other just in person....but when face to face is not possible, it's better than not having it.* (Alex, interview 2).

B. Moodle

This fully online course was delivered via the university learning management system—Moodle. Therefore, in designing this course, the lecturer used several strategies that were facilitated by Moodle. The findings suggest that these strategies as conceptual tools facilitated students' engagement in this course.

As explained by the lecturer it is vital for online courses to be well structured with a similar pattern in each week or module. The uniformity of the course allows the learners to have a positive experience of learning with learning technologies, as the students did not have to struggle to find materials and resources in separate folders. As one of the strategies, all the resources that included reading materials, YouTube clips, helpful tips and guidelines for writing and assignments were embedded in the texts or hyperlinks on the course Moodle page. As Richard said:

There are no boxes or folders full of papers for students to work their way through, but all are embedded within the texts or hyperlinks and everything follows a logical progression (interview 1)

This strategy seemed to make students' access to information as easy as possible, as they didn't "have to wrestle with the interface or finding resources to be able to learn" (Richard, interview 1). The importance of a structured course was also highlighted by the students and they appreciated that the lecturer "has been a very good coordinator and his work is structured" (Christine). Students also described that all the information is there and they can read in their own time.

Another strategy the lecturer used in the design of this course was creating several spaces for students to interact and communicate. These spaces comprised class news and notices, private and public communication spaces, sharing spaces, peer support spaces and Q and A spaces for each module. By creating several spaces for communication, the students were given a choice to suit their needs. In the lecturer's point of view, these strategies should be deliberately implemented and one strategy that suits one group may not work for another; therefore, it is important to consider the needs of that particular learning group in designing online courses. As pointed out by a student, these spaces were helpful when they needed help with their assignments. In situations where they needed assistance, more capable peers came in and guided them through the process.

I sent out a question on the public Question place. Alex came in and sent me an email how to do it. To me, it was little bit like a miracle because I had no knowledge of how to do either of those the Movie maker or the YouTube. And without instructions that Alex emailed, I couldn't have done it (Christine, interview 2)

In this case, Christine was struggling with one assignment where she had to create a 3-4 minute presentation to be uploaded to YouTube (or equivalent online multimedia tool). Alex, having the technical knowledge, offered help. Other general questions that were shared and answered on the public question space included questions on internet speed requirements, editing functions of Moodle discussions, assignment due dates, reference styles and computer brands.

Another well used space in this course was the sharing space. This space was continuously filled with information about software—PDF reader, screen capture, as well as information on embedding audio into

postings, using shortcuts, uploading URLs and docking blocks. Students acknowledged that sharing of ideas among peers about technology that can help them in their teaching and learning is particularly useful in their jobs although they are not tech savvy. Debbie stated:

These are wonderful little instruments that everybody else knows and I don't...so we share things that might be helpful and it's a great advantage. I'm never going to be brilliant at technology, but I might be able to make it useful to me in my job little bit more I think (Debbie, interview 2)

The participants' views suggested that the sharing of information and ideas helped them to get connected to each other as a learning community and increase their engagement with learning. Overall, the strategies that were used in the design of this course, as a conceptual tool, allowed the students to interact and communicate with each other in public or in private, choosing the method that suits them best. The question and answer space was in use to get help when students needed assistance with their assignments. The sharing space helped them to interact with each other while providing information on useful instruments that can be used in teaching and learning. As a conceptual tool, these structural strategies created by the lecturer acted as a mediator in making close connections among students allowing them to have a sense of belonging to a learning community.

In terms of the asynchronous forum discussion activity that was facilitated by Moodle, student participants reported both positive and negative opinions. One common idea shared by the students was that forum discussions as an asynchronous activity gives more time for them to reflect especially if students are shy or have problems with English as a second language. In Alex's opinion, *those second language speakers, when they are put on the spot it's a challenge, but on forums they have time to reflect and be prepared (Alex, interview 1)*. Debbie described that as a shy person she never talked in face-to-face tutorials during her first degree, as she thought whatever she says has already been said by other students and it's not going to add any value. She believed that in forum discussions everybody says something and online forums are an excellent method for discussions.

However, students felt that the forum discussions in this course were rather "official" and it is slow to get to know people, as they do not get to see people in forum discussions. As explained by Richard, humour plays an important role in online discussions. He explained:

Because I'll be nervous.....as they are...you've got to make them see you as a person who they can talk with ...and identify the person with it. Humour is part of that...and as you go along...they know when you pull their leg and you know...that's really important...so they feel comfortable and relaxed to be able to interact with me and others. And responding to those every day (Richard, interview 1)

He believes that humour helps students to lessen nervousness and increase interactions among students. However, Alex emphasized that in forum discussions, it is hard to have a sense of humour without physical cues.

I'm thinking of a couple of discussions we've had where I haven't quite been sure what perspective the person was coming from whereas you see them saying it, you can often judge a bit more from some of the

physical cues. I mean when I write, I write in some ways with the tone I have in my mind, but it can be sometimes sarcastic. You can make it come out, but that doesn't fully come out with the intonation and the timing and everything (Alex, interview 2)

As a learning experience, students did not fully enjoy the discussions, as they thought that physical cues were missing. Moodle as a virtual tool allowed the lecturer to embed resources within texts as well as design a well-structured Moodle page for this course.

C. Language

In this case study, Fiona who is a second language English speaker seemed to have issues, as at times she could not understand what the others were talking about.

I think sometimes I feel that I'm lost in discussions. Actually in this paper, I don't participate much because as I said I'm lost in this conversation. I need time (interview 1)

Since Fiona could not follow them she mentioned that she only read the discussions. When she was asked for the reasons why she couldn't follow them, she said that, *"When they used slang I didn't understand. I try to understand the general meaning. Sometimes they use short forms like letters. Sometimes even Richard uses this"* (interview 2). She also had difficulties in doing assignments, as she found it hard to understand what exactly needed to be done, but she managed to clarify things with the help of her fellow classmates. She mentioned that *"I found difficulties in doing assignments because I didn't understand, but I asked the others and the things became clearer"* (interview 2).

When Fiona was participating in Adobe virtual classroom activity, she had some difficulties with grammar and pronunciation (7 May observation). She seemed to be reading from her slides and she mentioned that she was wondering whether her peers could understand her presentation. As part of the Adobe virtual classroom activity, students reviewed one of their peer's presentation notes and facilitated a discussion by asking three questions from the presenter right after their presentation. Providing her views regarding this process and how language became an issue in this case, Debbie described that:

Well from my point of view the person who asked me questions, that was Fiona. Fiona has issues with English as a second language and the questions she asked me were not exactly around my presentation. They were more about who I was and what I was doing, so I didn't find her questions particularly useful (interview 2)

The findings suggested that Fiona appeared to be struggling with English as a second language in this course. In terms of tool mediation, it is apparent that language as an *abstract tool* mediated Fiona's engagement in both forum discussions and Adobe virtual Classroom activities. However, in her view since the course was fully online she had an advantage, as she had more time to think and reflect. Fiona compared her online learning experience with a face-to-face class and emphasized that *"because of language, it is better to learn online because I have more time to read"* (Fiona, interview 1).

V. CONCLUSION

This paper highlighted students' experiences and their perspectives of learning with technologies –Adobe virtual classroom and Moodle that facilitated activities, and their influence on students' engagement in a fully online university course. In this context, the affordances of the synchronous Adobe virtual classroom, as a virtual tool, facilitated collaboration and helped students in creating a sense of belonging to a learning community particularly with the video and audio features. However, the data also suggested that when interacting in real time some practical issues such as time zones should be considered in using synchronous learning technologies. In terms of the asynchronous forum discussion activity that was facilitated by Moodle, participants' views comprised both positive and negative opinions. Moodle discussions as an asynchronous activity, gave students more time to reflect. However, in forum discussions it seemed that it takes time to get to know people and also it is hard to have a sense of humour without physical cues. In terms of the design of the course, Moodle as a virtual tool allowed the lecturer to create a well-structured course where all the resources, video files and other documents were embedded in texts and hyperlinks and organized according to a logical progression that enabled the students to have a positive experience of learning with learning technologies. Students' voices indicated overall satisfaction in learning with learning technologies and achieving their learning goals in this course.

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