Using Activity Theory to understand contradictions in an online university course facilitated by Moodle

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Abstract:

Activity Theory can offer insights into learning processes that are facilitated by Learning Management Systems. Contradictions, as a basic principle of Activity Theory, assist in identifying the tensions and conflicts that emerge in systems of online learning environments. Using Activity Theory as its research framework, this study focuses on the contradictions that emerged in the form of tensions, frustrations, misunderstandings and miscommunication in a fully online university course in New Zealand. The data collection methods of this case study included individual interviews, online activity observation and documents analysis. Outlining some of the findings of the study, this paper will discuss how students' participation in learning activities facilitated by Moodle was affected by these contradictions.

Keywords-component; *Moodle; contradictions; Activity Theory; Learning Management Systems*

I. INTRODUCTION

Technological advancements in education have provided students with flexible and collaborative learning opportunities. For example, Learning Management Systems (LMS) have the ability to facilitate synchronous and asynchronous activities in which students have flexibility in participating in learning activities in terms of time, place and place. These systems also enable collaboration and interaction among students.

LMSs are also known as "learning platforms", "course management systems", "instructional management systems" and "distributed learning systems" [1], and some of the common LMSs are Moodle, Blackboard, Oncourse, Angel and Sakai. These systems are used to enhance face-to-face university courses as well as fully online courses. LMSs generally provide various tools for course administration and delivery and some of these functions include synchronous and asynchronous communication (chat and discussion forums), development and delivery of content (links to the internet resources), assessment (submission of assignments, quizzes), and management of students and class (enrolment, class list) [1]. Although LMSs are considered a powerful technology that can handle a range of aspects of learning processes with its functions, there are limitations that hinder its potential [2]. Furthermore, Beer, Clark and Jones [3] state that it is not clear to what extent LMSs

affect students' participation in activities in universities. These limitations can come in the form of conflicts, contradictions, miscommunication and misunderstanding in learning systems that can affect students' participation in e-learning activities. With this focus, using Activity Theory as its research framework, this study focuses on the contradictions that emerged in the form of tensions, frustrations, misunderstandings and miscommunication in a fully online university course in New Zealand. The paper includes some of the findings of this case study and a discussion on how students' participation in learning activities facilitated by Moodle was affected by these contradictions.

II. RESEARCH CONTEXT AND RESEARCH QUESTIONS

The course which was the focus of this case study was one of the papers of the Graduate diploma of Teaching and was taught fully online for 12 weeks in a university in New Zealand. All class interactions took place in the university LMS, Moodle, and most of the activities carried out in this paper were asynchronous. The participants who took part in my research were three students (Irene, Hannah and Jake) and their lecturer (Laura) from one stream out of three. The lecturers of other two streams (Faye and Michelle) also participated in my research. The lecturers of these three streams (Laura, Faye and Michelle) worked as a team but had their own ways of communicating in their own streams. For example, the lecturer of the group under this case study, Laura, uploaded voice files at the end of each week as feedback to her students' weekly discussion forums.

The research questions that guided the data analysis of this research were:

- What were the contradictions that emerged within an activity system of a fully online university course facilitated by Moodle?
- How was students' active participation in the course affected by these contradictions?

III. ACTIVITY THEORY AND ITS PRINCIPLE OF CONTRADICTIONS

Activity Theory is derived from socio-cultural and socio-historical theories and through the lens of Activity Theory, learners' construction of knowledge can be observed and analysed explicitly. Activity Theory can offer insights into learning processes that are facilitated by Learning Management Systems, in particular, it allows scholars to examine and document successful and unsuccessful incorporation of technologies and activities that are facilitated by LMSs in online learning environments.

Engeström's [4] Activity theory framework offers analytic tools that are appropriate for modelling activity systems. The constituents of an activity system include *subject, object, tools, rules, community* and *division of labour*. Figure 1 shows the basic structure of Activity Theory.
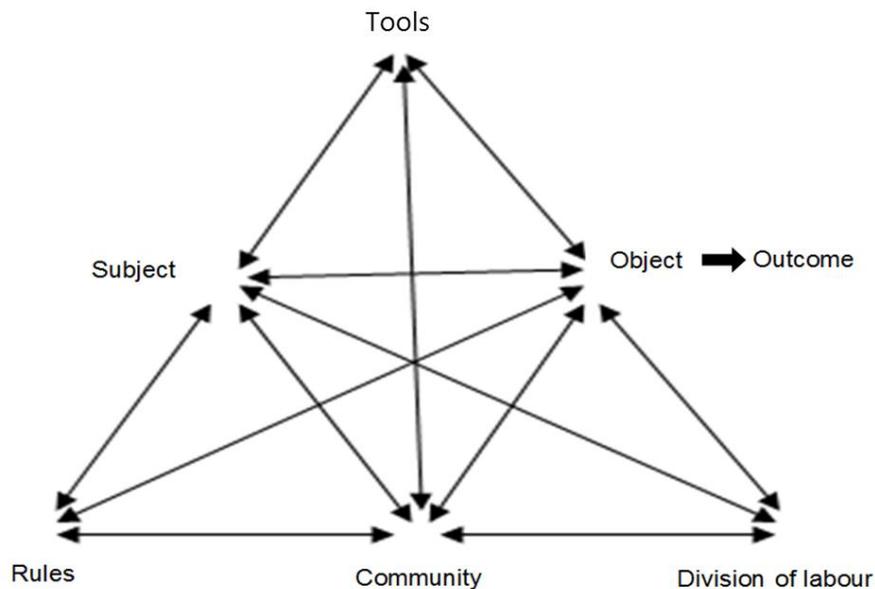
Figure 1: Activity Theory framework (adapted from Engeström [4])

Kaptelinin and Nardi [5]; Engeström [6]; Kaptelinin, Nardi and Macaulay [7] and Kaptelinin [8] have discussed the characteristics or principles of Activity Theory. Some of these basic principles of Activity Theory include object-orientedness, hierarchical structure of activity, internalization vs. externalization, mediation, development, multi-voicedness of activity systems, and contradictions as a source of change and development, which is to the focus of this paper.

Contradictions, as a basic principle of Activity Theory assist in identifying the tensions and conflicts that emerge in systems of online learning environments. Contradictions are also referred to as structural tensions that may have accumulated over time. These contradictions may create conflicts, interruptions and clashes: however, through the resolution of conflicts, they can also be considered as sources of change or development.

Contradictions are defined as "a misfit within elements, between them, between different activities, or between different developmental phases of a single activity" [9]. Engeström [4] proposes four levels of contradictions (1) primary, (2) secondary, (3) tertiary and (4) quaternary. The primary contradictions occur within the elements of activity systems (e.g. within the *community*). Secondary contradictions arise between the elements of an activity system (e.g. between the *community* and *subject*), tertiary contradictions arise when activity participants face situations where they have to use an advanced method to achieve an objective (e.g. when they are introduced a new technology), and quaternary contradictions occur between the central activity system and outside activity systems. In the context of my research, the contradictions that emerged within and between (primary and secondary) the elements of the activity system are illustrated in this paper. The following figure demonstrates a synchronous activity (forum discussion facilitated by Moodle) that is placed within the Activity Theory framework.
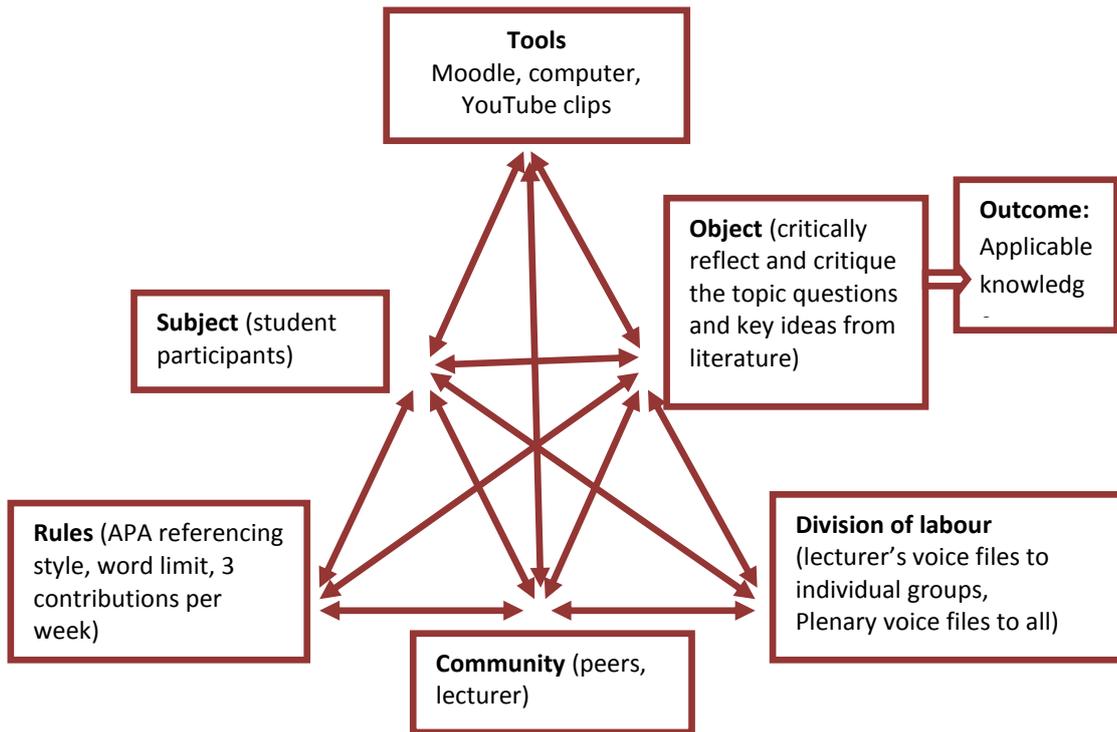
Figure 2: Asynchronous forum discussion activity system

IV. RESEARCH METHODS AND DATA ANALYSIS

The methods used for data collection of this research included interviews, observation of online activities and document analysis (course outline) and as a data management tool, NVivo was used. For the purpose of this paper, two asynchronous learning activities:

(1) PowerPoint presentation prepared for a conference and a reflection uploaded on Moodle, and

(2) Weekly forum discussions that were facilitated by Moodle, were selected for the data analysis.

Engestrom's [4] Activity theory model was used to organize the findings to identify the sources of these tensions and conflicts within and between elements of activity systems. In coding the data, relevant meaningful units from transcribed interviews, observational notes and relevant documents were identified and then were coded according to the elements of Activity Theory as a method of typology. Among the sub-themes that emerged under these main themes or the elements of Activity Theory, contradictions became visible in a variety of forms. These contradictions are illustrated in the following section.

V. FINDINGS AND DISCUSSION

The findings revealed that several contradictions occurred within and between the elements of activity systems in this context. These contradictions include issues related to course materials as *tools*, grading, communication; and opinions related to 'teacher's presence'.

A. *Presentation of materials*

The teaching materials in this course included journal articles, You Tube clips, PowerPoint slides and Podcasts. Students' voices indicated the way they felt about the presentation of these physical *tools* in this course and these views described the tensions and frustrations they experienced in this course.

Hannah pointed out that the students preferred to have the reading materials in the form of a book, as it was convenient for them to read. She mentioned that in a communication space many students raised the issue of having a book instead of several articles every week. She explained that:

> *Everybody wanted the book for reading. We all asked for it, and then a lecturer said that we can't have it, but afterwards she agreed because the request continued. Now she has agreed to it, but until I see it, I don't believe it you know for the next semester. They might say they haven't. They have to be organized enough to think of the materials 4 months in advance* (interview 2)

This issue was also highlighted by Irene. In her opinion, they could go back to the readings easily if they had the hard copy of a set of readings. She feels that not having a hard copy of the articles has "*actually been a bit of a pain*" (interview 2). However, when Michelle, who is the coordinator of the course, was asked regarding the issue of giving a printed copy of readings, she had a different view on that. She believed that by giving the articles every week to students, they could ensure the most recent publications were used.

> *The process of putting the readings online rather than in a hard copy has worked well because as the 12 weeks have unfolded and new papers have been published that are related to play that are quite new and exciting, so we can upload and talk about them* (Michelle, interview)

Students' voices suggested that they still preferred to have the book and if the lectures would like to give them new materials, they can upload extra materials on Moodle. Hannah also pointed out that "*Many people must have printed them all, seriously it's a lot of money. Students can't download some stuff (interview 2.)* Having to read on the screen or print articles on a weekly basis and not being able to download some of the materials was seen as frustrations that created tension in student participants.

In terms of presentation of materials, Irene seemed to have difficulty following some of Laura's Podcasts that were uploaded for their stream. This is because as Irene mentioned, Laura's Podcasts had background music in them and Irene, having a hearing difficulty, found it hard to follow them:

> *One other thing is Laura's Podcasts, they are often hard to hear because she sets the volume too low when she is recording. And I'm little bit deaf and it has to be dead quiet for me to concentrate. In one of them she had music playing in the background it was a great pain* (Irene, interview 2)

She also mentioned that she had some issues with downloading Podcasts in this course which affected her full participation in forum discussions. This was also acknowledged by Irene's lecturer, Laura. She stated that she had difficulties downloading the same Podcast and she was aware that students had the same problem:

> *The students had some difficulties I think getting into the Podcasts. Even I tried it at my home computer and it wasn't easy and it took me hours to download that drama thing. That can really preclude full participation* (Laura, interview 2)

Laura's view suggests that the students' active participation could have been affected when the students could not download the podcasts. Jake explained why some of the students could not open some of the Podcasts uploaded in this course. In his opinion, they were recorded using different formats and some students could not download them. As a suggestion he said planning and testing should be done before the course starts for a smooth run:

> *It seems that some of the Podcasts you could sync with iTune and you could automatically download, but then the other Podcasts were not through iTunes and it was in different formats, may be it was in an audio file or just the iTune thing and not everyone has iTune, so they should do just the audio Podcast and keep it nice and simple. I suppose it's trying out different things and seeing what's best. As we were told we have to be up-to-date with technology. Just realizing that it's an evolving process, but still being aware that things have to run smoothly like there's testing and everything, but should plan properly* (interview 2)

The contradictions that emerged within the element *Tools* in the activity system were in the form of frustrations and difficulties, and these seemed to hinder students' participation in some ways.

B. Issues on grading

In their assignment one, drawing on to the discussions and the literature, students were to create a PowerPoint presentation for a conference and also write a 1000 word reflection based on a set of reflective questions given and uploaded on Moodle. However, students were not sure whether they were to include notes in the PowerPoint presentation and some of the students posted questions on the Moodle communication space asking for clarifications from their lecturer, Laura. When students got a reply from Laura to the question, the students realized that they had been given contradictory information. Laura asked them to include notes while Faye, the lecturer of another stream had asked them not to include the notes in a previous conversation. In Irene's point of view, one person should have given instructions regarding assignments:

> *There was confusion there. Laura actually gave us wrong information. I think one person should be the person that deals with the actual sort of what is required for the assignments* (Irene, interview 2)

Students also seemed to be frustrated when this assignment was marked by someone else. Laura mentioned in an interview that she did not mark the first assignment—the PowerPoint slides they prepared for a conference and the reflection on that, as she was away at a conference in the United States. She mentioned, "*I didn't in the end mark the first assignment because I was away, but I did have a look at a few and I was very pleased with it*" (interview 2). However, related to the marking of assignment one, Hannah expressed her concern and stated that she is worried that someone else is marking their assignments.

> *At this moment my frustration is I know for sure that they are not correcting my assignments. Somebody else is correcting. It's like I got the name of somebody else who has corrected my assignment* (Hannah, interview 2)

When Laura was asked whether she would get help with marking students' assignments, she assured that she was going to mark them on her own. However, the students were not informed of any of the arrangements or plans regarding the marking.

These frustrations and tensions arose between the *subject* (students) and the *community* (lecturers) in this context as a result of not having thorough planning in terms of the lecturers' roles and responsibilities (*division of labour*). Hannah's worry of someone else marking her assignments could be avoided if the students were given clear information on why Laura did not mark the first assignment and an assurance that she would moderate them and would mark the rest of the assessments.

C. Issues on communication

Laura's absence, and someone else marking students' assignments, further complicated issues when students tried to communicate with Laura assuming that she was marking their assignment one. Irene described that after she submitted her assignment, she realized that she had forgotten to include references, so she sent a message to Laura in the one-to-one space on Moodle asking whether she could send the references. Since Laura was away, Michelle looked after Laura's stream and got access to Laura's one-to-one space. Irene was not aware of this arrangement and also the fact that someone else marked her assignment. Irene said:

> *I sent a note on Moodle in one to one space saying could I resend the assignment and Michelle sent a reply saying yes just send it, but I don't think Laura got it because the feedback says that it's with incomplete references* (Irene, interview 2)

Irene believed that although Michelle replied giving permission to send the references, her message or references did not seem to reach Laura. This was seen as a gap in their communication link that created frustration. Prior to this incident Laura also experienced an issue that she was locked out of the one-to-one communication space. She explained how she got to know that she was not able to see students' messages because of the way (assigned role) she was brought into the course.

> *The other problem I had was that in the one on one space I assumed that I hadn't heard from any of my students in the whole course. And then, quite recently, a student emailed me and said "you haven't answered my question on one on one space". When I tried to go in I discovered I had been locked out of it, so I had no way of knowing….I think it was because when I was initially brought into the course I was brought in on the wrong criteria* (Laura, interview 2).

In relation to communication issues, Hannah also had an experience where her message was not answered for some time. Hannah wrote to her lecturer and asked for an example of an art work so that she could get an idea of exactly what she needed to do. This may be due to Laura's issue of being locked out of the one-to-one space. Hannah mentioned that when she didn't get a reply from them, out of frustration she started making her own art work which was quite different:

> *I asked them to send me an example before the two week holiday because that was really a good break you know. Then I didn't get a reply for a very long time. That was a drawback because I somehow started doing something that was completely different, but anyway thank god that there was no right or wrong, so I submitted it. But you know when we ask something…it's not like we are desperate at least if we get that…I mean this is the least we get back from our teachers* (interview 2)

D. Different student-lecturer and lecturer-lecturer opinions on 'teacher's presence'

The lecturers in this course did not participate in weekly forum discussions, but they uploaded feedback in the form of voice files and plenary podcasts in most of the weeks. This created controversial opinions between students and lecturers as well as among lecturers. Faye attested that, *"our philosophy in the program is not going to the discussions during the week because it does interrupt the flow of what people are saying"* (interview 1). Michelle shared similar views regarding "teachers' presence" and she explained that if the lecturers are there, the students may not freely express their opinions. Michelle commented:

> *I'd much prefer that we go in at the end or beginning in the week to do the voice file …… I'm not going to intervene in the conversation because I know that would shut it down and students will respond thinking "she's the lecturer and we better say that". I think it allows them more opportunity to have honest discussions with each other* (interview)

On the other hand, students felt that they were left on their own and they were not sure whether they were on the right track without the "teacher's presence". The students seemed to need some kind of guidance and acknowledgement of their contributions. For example, Hannah mentioned:

> *I did another course and the lecturer used to be part of our online discussion and lead us through it. That method is better because you feel the presence. Your teacher is there…. But here they say happy discussion and they post it…I don't know, for example this is the end of 3rd week and I haven't got any feedback what I have been doing, so I really don't know whether I'm doing the right thing* (interview 1).

Regarding 'teacher's presence' in this context, Laura had a different opinion to Faye and Michelle, as she was more keen to have a dialogue with her students than giving them a talk at the end of the week. She accentuated:

> *Well as I said the discussion voice files ….my voice files to the students were my way of having a genuine dialogue with them when I couldn't go into their online space, so I think it would be best to establish a way of having that dialogue as a reciprocal exchange - not just mere responding as an end point, like a plenary* (Laura, interview 2)

Laura believed that two way communication is important for her, as that's her way of having a dialogue with her students. Laura said, *"Dialogue to me is not "you speak and then I respond", it's an on-going reciprocal thing. I think that I would like to have more of that in this course"* (interview 2). She also mentioned that there were times in the discussions she would have quite liked to go in and steer it in a different direction. However, when Laura was asked whether she meant that the lecturers should participate in forum discussions, she was not sure whether that was what she wanted. Alternatively she suggested that if she had a choice she preferred not to grade all the discussions, but just a few of them and let the students have more free thinking:

> *I think in a way, if it was my choice, I would prefer not to grade but instead create a kind of capacity to 'free fall' as I call it...free fall thinking. It's somewhat constrained, with the grading. May be I wouldn't grade all the discussions. I might grade perhaps the last three or various parts rather than all, but it's not up to me* (interview 2)

The differing opinions on "teachers' presence" in this context denoted clashes between students' and lecturers' views. Students' views demonstrated their need to have the lecturer as part of their *community* while engaging in forum discussions. With lecturers' absence in forum discussions, the findings also showed an absence of reciprocal communication between the students and the lecturers that interrupted students' participation.

VI. CONCLUSION

As Kuuti [9] suggests, contradictions can be "problems, ruptures, breakdowns, clashes" in activities. The contradictions that emerged within and between the elements of activity systems in this case study were seen in diverse forms such as frustrations, tensions, difficulties and contradictory opinions. Presentation of course materials that included journal articles and Podcasts as physical *tools* created tensions among students when they were unable to download some of them and when they had to read on the screen or print them each week. The lack of planning in terms of individual responsibilities (*division of labour*) also caused confusion in this context when the students were given contradictory information. As suggested by the students, lecturers' roles as well as information provided regarding assignments and marking should have been explicit. The contradictions related to the issue of miscommunication was also due to lack of planning and communication. As a result of bringing Laura under the wrong category (assigned role) in Moodle, both the students and their lecturer were frustrated. The opposing views on lecturers' participation in forum discussions indicated the clashes that were in this activity system that affected students' participation in this course. Lecturers' feedback and guidance as well as reciprocal communication in forum discussions were rather limited since the lecturers decided not to be part of the *community* in this context. Therefore, successful implementation of an online course that is facilitated by an LMS needs careful planning that suits the needs of students. This includes structural strategies in the design of the course. The findings from this research may help overcome tensions and contradictions when designing courses and activities in online learning environments.

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