

Examining the Design of Learning Activities in Second Life through the lens of Activity Theory

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Abstract

Second Life (SL) has in recent years become accepted as a platform for educational activities, supporting a range of activities from informal meetings to complete courses offered in the 3D world as part of a university's curriculum (Molka-Danielsen, 2009). Learning activities within SL can be identified as a form of e-learning¹, but one which in many ways differs from more traditional set-ups in Learning Management Systems (LMS). The goals and objectives of e-learning can vary widely. But, e-learning should ideally offer innovative ways of coming in contact with students. Such innovation can give universities access to new markets such as the support of distance students or lifelong learners. At present, e-learning for many universities is practiced as blended learning, and implemented more commonly through university administered LMSs. Studies support that most teachers do not innovate or change their way of teaching when adopting LMS systems. They use the LMS in the delivery of course content, but do not have learning activities that take advantage of the LMS functions that activate students or create relationships within groups. Similarly we hypothesize that teachers that are new adopters of SL may attempt to replicate real world classroom activities, instead of designing learning activities that take advantage of the pedagogic aspects of the SL environment. Such learning systems fail to support social constructivist pedagogies and as such the value to the students may be diminished. In this paper, we use the theoretical lens of Activity Theory to examine the operational mechanisms behind this issue.

Keywords: Teaching design, instructional approaches, Activity Theory, Second Life, mediating artifacts

1 Introduction

While using ICT is an obvious prerequisite for e-learning the challenge is greater than achieving mere technical know-how. We propose that also including an integration and redesign of teaching and learning practices in these types of environment is essential in order to achieve a more meaningful impact on the learning opportunities for the students, and can determine the success of a university's e-learning strategy. In particular, an innovative design of teaching practices can initially give opportunity for the support of lifelong learners and further allow for learning to continue outside a school financed learning activity. This article examines the impact or influence of "instructional strategies" as a mediating artifact in addition to the mediating artifact of Second Life in an e-learning activity. We use Activity Theory as a theoretical lens and

¹ To give a more general definition, e-learning is the mediation of learning through mediating artifacts such as information communication technology (ICT).

In recent years, Activity Theory has been used to examine educational systems and the innovative use of ICT in teaching and learning activities. Kaptelinin and Nardi (2006, p.62) claim that Activity Theory offers a conceptual framework that allows us to “bridge the gap between motivation and action (and) provides a coherent account for processes at various levels of acting in the world.” Kuutti (1996) applies it as he looked at how ICT, such as the use of an LMS, supports learning and teaching actions (such as planning, writing up, producing learning materials, organizing content, assessment, and so forth). More recently, Blin and Munro (2008) examined how e-learning would transform or disrupt teaching practices using an Activity Theory analysis to examine the processes involved in the implementation of the use of an LMS system. They found that the expected transformation did not take place, even following their institution’s wide deployment of the system and training opportunities of the system’s advanced features that would support collaborative work. These features were simply not adopted by faculty. Lastly Activity Theory was used by, Karasavvidis (2009). He examined under what conditions a “Computer Supported Collaborative Learning” solution would be adopted by 51 teachers to support their daily practice. They found main obstacles to be time and curriculum constraints.

Through a survey, Molde University College has sought to find out how teachers make use of the school supported LMS called ClassFronter for use with their courses. The survey was administered by the IT Center on March 30th, 2009. The link to the survey on Questback was sent to 103 teaching faculty members. There were 63 responses, with a response rate of 61%. A brief summary of the responses show that: 95% of the faculty use Fronter in teaching, 57% use it daily, 40% use it weekly, and 3% less often. On use, 95% of the respondents use Fronter to give students access to files (course content). 90% leave messages on the course page but 48% also send these messages in addition in email. Only 45% use the LMS to receive work from students. Regarding what affordances of the LMS are not used: 81% have never used testing tools on Fronter, 70% have not used a discussion forum (22% have tried it, and only 8% have used it several times), 72% have not used Fronter documents. Finally 77% think there is enough education and support in the use of Fronter. These results align closely with the survey given by Blin (2008). It supports that the availability of mediating tools alone do not mean that teaching practices are changing. Nardi (1996, p38) makes this general point when discussing the concept of ‘context’ from an activity theoretical point of view: “Context is both internal to people—involving specific objects and goals—and, at the same time, external to people, involving artifacts, other people, specific settings” and cannot be conceived as just a “set of external resources lying about”. “People consciously and deliberately generate contexts (activities) in part through their own objectives; hence context is not just ‘out there.’” In other words, as the results from the survey above show, it is not enough to provide new mediating artifacts and expect things to change. A more complete analysis that involves the objectives for using the tools in a system that involves more variables than the mere technical affordances of the tool is needed in order to understand the success/failure of tool implementation in an educational institution. In this paper, we will look at teaching practices more holistically within the learning system in our examination using Activity Theory.

3 Research Method

This paper uses the theoretical lens of Activity Theory to examine two courses given in Second Life. We begin by identifying the nodes of the first course context, the debating course. The overall objective of the course, teachers as subjects and students as objects are presented in the next section. The mediating artifacts are: the 3D environment of Second Life, the course timetables, materials and teaching approaches. The rules are a set of several academic program rules. As will be described below the students are from several academic programs and as such receive credits for completing the course within their respective programs. The learning community includes not only the faculty and learners of each institution but the learners and

learning groups within Second Life. The division of labor is worked out by the responsible teachers initially, but also internally among the groups of students. For data analysis we collected attendance and group membership information on the participants through their avatar presences in SL. In addition, we gave surveys with open ended questions to the students to learn about their opinions about the effectiveness of mediating environment.

To place this analysis in context, we compare the attendance, group membership information and survey responses with a control group from another teaching activity, a Purchasing and Supply course that was also given on Kamimo Education Island in the same timeframe. The control case is described further under the section on data collection.

4 Case of Study

The first case of study is the activity of conducting a debating course in Second Life. The debating course, hereafter called “Debating in SL” was offered in the spring semester of 2009 and lead by the instructors under the AVALON project. The course had been designed as a cross-cultural collaborative experiment, and as such, care had been taken to address what Engström (2001, p.133) calls the four central questions of any theory of learning, namely: 1. Who are the learners?, 2. Why do they learn and make the effort, 3. What do they learn, what are the contents and outcomes of learning?, and 4. How do they learn? When designing the course these questions had to be addressed from the different prerequisites presented by the four distinct educational contexts of the different participants. When planning the course, the educators involved had all contributed to the content so that it would be relevant for the program of their own student group while at the same time taking the needs of the other student groups into consideration.

The student body consisted of 12 students in total: 5 were from the Manchester University in UK, 3 were from Mid Sweden University in Sweden, 1 was from the University of Pisa in Italy, and 3 were from the University of Central Missouri in USA. The Manchester students were teacher trainees and were attending the course as part of an elective on on-line learning. From these students’ point of view the main interest in the course lay in partaking in an on-line learning event of this nature in order to gain experience and ideas for the future. The students also had the choice to use the experiences from the course when writing their special papers. The Swedish participants were all students on an Internet English language program. They had been recruited on a voluntary basis and Debating in SL replaced a regular course unit that involved academic presentation and oral proficiency. As such, the Swedish students’ motivation for joining the course thus consisted of practicing oral academic discourse in an authentic setting with native speakers. The Italian student was attending a PhD program and her motivation for participating in Debating in SL was to improve her oral proficiency. An acceptable level of English is a prerequisite for any PhD student within the Italian system. The students from Central Missouri were attending a composition class on the theme of cyber culture and were offered extra credits in their ordinary course if attending Debating in SL. In addition, they were encouraged to use the debating topics as starting points for their future compulsory compositions. When designing the course, these different motivational starting points thus had to be worked into the design.

With questions 1, 2 and 3 of Engströms model in mind, and based on the different prerequisites of the different student groups the objectives of the Debating in SL course were worked out and listed on the course homepage:

- Technical/tools: Learning to use virtual worlds for learning, both as a tool for communication and a source of information.

- **Social:** To get to know friends from other countries and being able to collaborate with them in an online environment towards a common goal.
- **Academic:** The focus here is on presenting ideas in a convincing manner, looking at issues such as structure, cohesion, presentation techniques etc.

The first of these learning objectives was designed to appeal to the Manchester and Missouri students in particular. Both of these groups had an interest in the technical aspects involved and the Manchester students in particular, also had an interest in the actual learning processes involved. For the Swedish students this objective also made sense since they were attending an Internet course and Debating in SL represented a new way of approaching e-learning. The social objective was mainly included as a way of addressing the fourth question in Engström's list, namely "How they learn?" The course was designed according to a social, collaborative learning model and as such it was important to include this in the overall objectives.

The academic objective was included primarily with the Swedish and Central Missouri students in mind. Both of these students groups were actually studying courses that involved academic presentation. In order to accommodate the Manchester students' (and central Missouri students') subject interest, the topics chosen for the debate all dealt with matters related to various aspects of Internet culture, subjects which were also of general interest for all the students involved. In summary then, the learning activities in the course were designed bearing the different objectives of the student's groups in mind, and as such fits into an activity theoretical model of design.

All course meetings between teachers and students were offered solely within the 3D world of SL. The plan of the course was to divide students into 4 groups of mixed cultures (Swedish, Italian, English and American) and allow these groups to work together in order to prepare a formal oral presentation for or against a particular topic over the sessions, and finally present these as groups in a public debate. Theoretical background on how to deliver a public speech would also be provided. The course timetable can be seen in Table 1. The sessions in SL were scheduled for 2 hours each, with meetings in part or whole taking place on the sim called Kamimo Education Island. The primary instructor from the Swedish partner university was assisted in several lectures by colleagues from the other three universities in the United States, England and Italy. Students for the course were recruited from all the four universities. In addition, there were two teacher observers and one PhD student who attended some of the course sessions. Because course participants were physically located in 3 time zones, the timetable also listed the session times for each time zone.

Table 1. Course timetable for Debating in SL

Session Date	Activities
Tuesday 7 th April, 2009. Session 1: Introduction	<ul style="list-style-type: none"> • Checking tools • Introducing each other • Course outline • Splitting into groups • Deciding on topics
Tuesday 21 st April, 2009. Session 2: Overview -Debating techniques	<ul style="list-style-type: none"> • Short lecture on debating and presentation techniques • Demonstration videos • Group work
Tuesday 28 th April, 2009.	<ul style="list-style-type: none"> • Data gathering at different locations in

Session 3: Preparation of Presentation	Second Life <ul style="list-style-type: none"> Group work on organising presentation
Session (4) Preparation of Presentation 2 Time and location should be decided by the group	<ul style="list-style-type: none"> Data gathering at different locations in Second Life Group work on organising presentation
Tuesday 5 th May, 2009. Session 5 Final Debate	<ul style="list-style-type: none"> Presentations groups 1-4 Voting Reflection and Evaluation

The primary instructor used several media to communicate with students prior and between SL sessions. He exchanged email with the students, and provided a course homepage⁴ that contained links to help files about how to get started in SL. On the wiki it was also possible to see the course structure: timetable, objective, session outline and links to resources such as YouTube clips about debating. In addition there was a course blog⁵ where reflective feedback was shared with the students. In designing the course the team built on former experiences in SL (Deutschmann and Panichi, 2009) that were based on CSCL such as Salmon's (2004) Five Stage Model. For example, technical initiation, (the first stage – Access and Motivation - in Salmon's model) was worked into the course design and participants were required to try out SL (establish avatars, and basic communicative tools) prior to the course start. This process was initiated through other means of communication such as email, instructions on the course homepage and synchronous guidance using telephone or Skype. In addition, time for socialization was an integral part of the course design (cf. stage 2 – the Online Socialization stage in Salmon's model), as is noted in session 1 of the timetable. Socialization and collaboration was also connected to the cognitive deliverable of a debate.

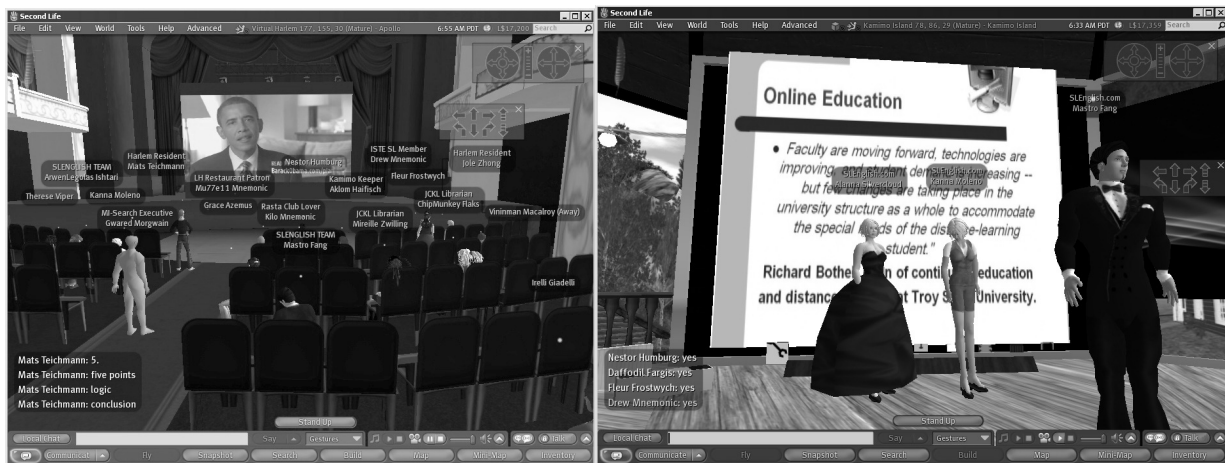


Figure 2. The left figure shows students receiving theoretical background of how to conduct a debate. The right image demonstrates a group giving a final debate presentation.

5 Data Collection and Interpretation

Attendance and group membership in the course “Debating in SL” was collected from SL interface data including profiles, group information, and visitor counters. In addition, we asked the group of 12 student’s

⁴ Course homepage: <http://dooku.miun.se/mats.deutschmann/Avalon/Debating%20in%20SL/index.htm>

⁵ Course blog: <http://avalondebating.blogspot.com/>

questions in end-of-course questionnaires. Eleven of 12 students answered the questionnaires. These were available on SurveyMonkey and links to the question form were sent to student in email.

A summary of information is noted about students' presence in SL. The students each created an "avatar" to participate in SL. Listed here, the birth date is the date of entry into SL, followed by the group membership's count, and followed by the last login date of the avatar. The course ended on May 5th.

- Lead instructor – b. Aug 17, 2007, 6 groups, 6-may-09 (as of 12 may 09)
- Assistant teacher– b. Nov 11, 2005, 21 groups, 11-may-09 (as of 11 may 09)
- PhD student (observing) – b. Feb. 3, 2008, no groups. (last known logon 7-april-09)
- Observing faculty – b. Jan 16, 2009, 1 group, 7-april-09 (as of 12 may 09)
- Observing faculty – b. Jan 25, 2008, 11 groups, 10-may-09 (as of 12 may 09)
- Students – all were born between January 15th and April 7th, one student belonged to 16 groups, two students belonged to 3 groups, three students belonged to 1 group, and six students belonged to no groups.

Analysis of attendance showed that four of six students belonging to at least one group had gone into SL on the day after the course ended. In response to, "How much time do you think you will spend in SL now that the class is over?": those belonging to 3 or more groups predicted visiting SL each week (1-to-4 hours); of students belonging to one group, predicted visiting SL each month (1-to-4 hours). It was reported that all 12 students had participated in all the course sessions.

Students were asked to describe their learning goals and whether these were achieved." They responded:

- I joined the debate team for extra credit but I had several choices for extra credit. I chose the debate team because I enjoy interacting with people from other cultures. (Central Missouri student)
- I was intending to learn about debating skills as well as second life technical skills. Yes in general they have been achieved. (Central Missouri student)
- To debate certain subjects. The goal was achieved, yes. (Swedish student)
- Gaining debating and SL skills. Yes. (Swedish student)
- To meet people from other countries and see if SL can be usable in a future teaching. Yes. (Manchester student)
- Learning to use virtual worlds for learning, both as a tool for communication and a source of information. (Manchester student)
- My personal goal? To become a better English speaker and learn more about speaking, debating and online education in general. Yeah! I think I did improve in all those areas. (Italian student)
- Debating course. Yes we learned a few things about debating and the way we should do that. (Swedish student)
- The learning goal was mainly to get a better idea of what learning in an online environment is like. It was definitely achieved. (Manchester student)

Note how different students have focused on different goals, depending on what educational context they come from.

In further feedback, one student responded to what they had learned, "I learnt quite a lot from the course especially about the ways to make your speech a blast, it was really exciting and also about the technical matters dealing with Second Life. When firstly joining, I did not know how to even change my avatar's

clothes, but now I could handle more affordances of second life. It's really exciting." And yet another response, "Speaking English, debating (it was nice to refresh my theoretical, and to some extent, practical knowledge about rhetoric) functions of different online educational tools, online socializing in general etc." We conclude from these remarks, that a cognitive goal was achieved and that it resonated as an expression of satisfaction among the students.

When asked what worked well about the learning experience in SL various responses were noted, but most commonly the advantage of collaborating and working in groups was mentioned.

- Allowed us to practice debate speeches real time Allowed us to collaborate and have good discussions provided an opportunity to meet students from other Universities.
- 1. The presentation of the debating skill with the video. 2. The presentation itself (though I had some trouble at the time with my second life kept on crashing and could not give comment sometimes) 3. The collaboration with my group mates.
- The debate. The groups. The subjects.
- Voice Chat Group work Meeting new people new students from other countries the debates
- 1. Staff 2.The possibility to work into groups divided into different places, without interferences. 3. Whiteboard
- Collaboration with my group mates, my own development as a SL user and online student and also the conversations with and the feedback from the teacher.
- 1) Get to know SL 2) Feel more comfortable with it 3) Presentation practice
- The lectures when our teachers spoke and we listened. Easy to access Easy to get started

When asked what could be improved, this group of 12 students asked for: more group lectures for interaction, a tutorial about how to improve the appearance of their avatar, a tool for dividing into groups, more information about where to meet in SL, more time to know each other, and a boost of audio.

In brief the design of the course and teaching practices seemed to work well within the virtual teaching spaces and seemed to create connections between the study group members during the course. When asked 9 of the 11 respondents said they would use SL in the future, indicating a possible connection to the larger SL learning community. In addition, half of the students had already joined groups within SL that had nothing to do with the course itself. We felt that this case was demonstrative of a good integration of nodes within the active learning system.

6 Comparison to a Control Group

Another course was being offered in the same time period as the debating course with Molde University College (MC). Since MC owns and manages Kamimo Education Island, it has been promoted as a testing ground for e-learning within the school. One course called "LOG702 Purchasing and Supply Theory" was attempting a trial in SL. A single lecture role play case exercise was planned for the course. The objective of the course meeting was for students to role play in a response to a request-for-proposal for an ERP system. The course exercise was lead by two MC teachers. The course only held one classroom session in SL. Alternatively the students had regular meetings with each other within the physical classroom. They did not need SL to form connections with their classmates. Secondly, even though presentations were done in groups, the groups had met and worked together before entering SL. The students were only asked to show up in the virtual classroom, and to speak while their PowerPoint presentation as it was displayed in-world.

To facilitate bringing the students into SL, the course had a teaching assistant (TA). One of the teachers and the TA were located in Molde, while the other teacher was on faculty visit in Australia. The TA has been active in SL and was a participant in earlier courses given on Kamimo. The TA initiated a session to sign up students in SL on March 30th and to show them the virtual classroom location. The IT center at MC also arranged a computer lab where 25 PCs were set up to support SL.

The students attending the course are Masters' students in Logistics and there are 30 students registered for the course. The students come from a variety of cultural backgrounds but 90% are residing in Molde for their studies.

Looking at a summary of the attendance of the teaching faculty and students as was done above, we see for this course the following:

- Teaching Assistant – b. 17-aug-2008, 18 groups, last login April 27th-09 as of May 7th-09.
- Local Teacher – b. 25-nov-2008, no groups, last known login April 1st-09 as of May 7th-09.
- Distance Teacher – b. 19-aug-2007, 2 groups, last login April 16th-09 as of May 7th-09.
- Students – 21 avatars were created on May 30th, 2009. These were detected to be present within SL on that day, and these 21 were present in the virtual classroom on April 1st, 2009 during the scheduled lecture. None of these have been noted in the classroom since April 1st as of May 6th, 2009 (over one month after the lecture). None of these avatars have joined groups. Although the accounts exist, they appear to be unused.



Figure 3. The left image show the logistics students on the first meeting in SL on March 30th, finding the classroom and learning to move. The right image shows the role play session on April 1st 2009.

The same questionnaire as noted in the primary case had been given to all 30 registered students. A link to the SurveyMonkey form was sent in SL to 21 avatars on the day following the lecture, and it was sent in email to 30 email accounts. The survey was sent a second time in email one week later. Only 6 partial responses were received for a 20% response rate.

In response to, “How much time do you think you will spend in SL now that the class is over?” there were four responses of “almost never” and no other replies.

When asked to describe their learning goals and whether these were achieved, three responses were obtained:

- Conference with 3 simulated vendors selling a product. Goal was achieved
- Presentation of ERP supplier offerings as a fundament for further case study. Goal almost achieved, but the presentations went way to blurry, and made it hard to follow slide show. Other than that perfect
- We had a meeting with three vendors of ERP systems, who presented their respective systems for us as the management group of a company interested in investing in an ERP system. I think the goal was achieved.

When asked what worked well about the learning experience in SL only a few vague responses were received such as “most worked well” or “fairly good.” Alternatively, when asked what did not work well, a few more specific responses were:

- The people speaking must be able to communicate well. - the house in Kamino island was hard to locate in the beginning. - should have known who was the responsible person in there so that we could always have someone to ask and guide if needed.
- Better slide show arrangements, where user can control the slide show, instead of an external person get the slide show clear, so it can be used in a better way.
- As we used PowerPoint presentations in second life the slides took about 20 seconds to get sharp and readable. This should be improved before using this as a more serious part of teaching.

It was clear that this course meeting was replicating the classroom experience and that there were some surprises when the virtual classroom did not function in the same way as the physical one. Information to the students prior to course session, such as how to control the camera or how to set preferences on computers so that lag is reduced could have improved the virtual classroom experience. Also, while this group was concerned about “seeing” externally prepared materials of slides, the debating course participants although they also used PowerPoint slides with their debates emphasized concern about “hearing” the live discussion that was happening during the course session.

7 Discussion

The strength of Activity Theory in these contexts is that it takes a number of factors into account in order to explain failures and successes, including technical, formal and social structures. To exemplify we can envisage what happens when a traditional campus course is moved into an online environment without taking the prerequisites dictated by the new situation and the affordances of the learning environment into account. An online context will require changes of the values of several nodes in the above model, and not taking these into account may well result in disruptions. Rules, for example, will have to be adapted to suit the new situation. It may not be feasible to hold scheduled lectures between 2-5 p.m. on Thursdays anymore since the “Object”, the range of students, may be quite different than that of a more traditional setting and may, for example be adults with part time jobs. Similarly, expecting students to engage in collaborative learning might be futile if rules such as the structure for examination has not been changed to support this collaborative model; if students are examined entirely on their individual efforts using a traditional written exam setting, where are the motivation to engage in collaborative work? From a teacher perspective there may be similar problems. Traditional systems of division of labor may be poorly adapted to new ways of working. On campus students will naturally turn to It-technicians if the computers do not work and to departmental secretaries when they need help with administrative aspects such as registering for exams. If these points of contact are not provided in the online environment the responsibility will fall on the teacher, often the only

point of contact to the department. Finally, we have to acknowledge that teaching practices are often firmly rooted in a teacher community and there is often strong resistance to change. No technical tool, no matter how good, will change this overnight.

Further in light of our observations, we find motivation differs between the groups of students. For example, the students in the purchasing course were much less motivated to follow up on surveys or to re-enter SL. But, why should they be? The activity in their case was in practice unmotivated since they had access to their teachers and fellow students even without SL. SL as a tool in this case did not really fit into the structure either. To what extent was it an examination task, ie was it part of the rules system? Did they have to attend? On the other hand to what extent were the debating students motivated by the formal requirements of their course structures? The Swedish students, for example did it as an alternative to a normal writing course and the Missouri students got 'extra credits'.

Looking at the relative success of using SL in the debating course as compared to the relative failure of using it the "LOG702 Purchasing and Supply Theory" course from an activity theoretical point of view, we can say that in the latter case the use of SL has not been grounded and motivated in the more general context, but has rather fallen into the trap of seeing the tool as an "external resources lying about" (cf Nardi 1996 above).

8 Concluding Remarks

In this paper we have used Activity Theory to analyze the operations of the social structure of teaching a course within SL. Although the control case was not a full course, but only one lecture session, it demonstrates the importance of integrating the interactions between subjects, objects, mediating artifacts and the learning community within the system, while we assumed in this case that the rules and divisions of labor were accommodating to the activity. If the objective of the educational institution is to effectively apply e-learning, then teaching practices must be innovative or at least change to make use of the affordances of the mediating environment. One failure resides in the present use of LMS systems by many institutions. Alternatively 3D virtual worlds offer opportunity to be used in education, but to be used effectively teaching practices must be designed to support collaboration and group work, to support student autonomy, and to support Social Constructivist pedagogy. If teaching practices do not change, institutions will not realize the potential of the technologies that they do adopt to reach their present markets of distance students and lifelong learners.

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