

An Online Breakdown

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ABSTRACT

Focus of the study is how digital tools can make a change in flexible education. This is based on a case study of an educational situation in teacher training where a major tool of online teaching broke down. The students' reactions in and after the breakdown situation are basis for the case study. The study shows some characteristics of flexible education, which can be of importance in the development of flexible learning. A sociocultural framework is used to explain processes of students' knowledge building in different communities.

Keywords: teacher training, flexible education, online learning, knowledge building, socio-cultural theory

Introduction

Information and communication technology are changing higher education both on and off campus. E-learning is established as a full part of the education system (Bélisle, 2007). The term distant education is usually defined as teaching where the teachers and students are separated in space and/or time (Norwegian government, 1997). The growth of distant education is an international trend where the new technologies for learning play a fundamental part of flexible learning (Tate and Mills, 1999). The use of Learning Management Systems (LMS) and podcasts make it possible for students to be separated from teachers both in place and time, but still have access to pictures and sound. Synchronous use of video transmission makes it possible for teachers and students to be separated in place, but together online in time. Improvement in technology and increasing bandwidth capabilities has strengthened both asynchronous and synchronous education. According to Hrastinski (2008): "asynchronous and synchronous e-learning complement each other." The term flexible education usually includes the concept of distant education, e-learning, synchronous and asynchronous education and other forms of distributed education (Sengupta et al., 2012). The concept of flexible learning can be formulated this way:

"Flexible education emphasizes diversity in teaching how digital tools make it possible to tailor programs for various student groups. Flexible learning is a set of educational philosophies and systems, concerned with providing learners with increased choice, convenience, and personalization to suit the learner. In particular, flexible learning provides learners with choices about where, when, and how learning occurs" (Shurville et al., 2008).

In Norway, flexible education has been growing both in quantity and quality. Two trends illustrate this change. ICT is an integral part of every day life and "Parallel to this development, Norwegian higher education has made the use of ICT a high priority, both on and off campus" (Rønning and Grepperud, 2006). Nesna University College is located in a rural area near the Arctic Circle in Norway. The main subject of education is teacher training. Historically, it has been organized both as on campus study, and as flexible education geared toward students working as teachers (Grepperud, 2005). Nesna University College's priorities are now directed to flexible forms of education (Hegerholm, 2011). A pilot project is currently being implemented, where the teacher training students are mainly off campus and linked to a local school for hands-on training. They are supported by Internet, which includes asynchronous and synchronous communication.

This case study focuses on a flexible learning situation in the pilot project where the synchronous online video education broke down and was replaced by asynchronous podcast lecture. Relevant questions in this case are: What do these students express as important characteristics of their flexible learning situation? – And: How do they learn? The study uses a socio-cultural framework to explain the process of learning.

Socio-cultural View on Learning

Socio-cultural theories of learning emphasize people as members of communities, where social interaction and the use of tools serve as a foundation for learning. People use tools to develop and change objects (L. Vygotsky, 1978). Leontév (1978) developed a viewpoint that saw such activity as a collective undertaking. This view on activity was expanded by Engeström (1987) into a model where acting with tools was based on community interaction. Rules and division of labour direct the use of tools, which develops knowledge of both the individual and the community (Engeström, 2001). The process of learning is a central part of sociocultural theories. According to Wenger (1998),

learning consists of processes of participation in communities of practice. Communities of practice exist where people interact. The important question is not if participants learn, but what they learn (Lave & Wenger, 1991). Wells (1999) formulates the knowledge building process as “appropriation through participation in activity”. In this context, learning can be seen as the participation in a community where the division of labour, rules and tools are a fundamental part of knowledge building processes.

Building Knowledge

To understand the process of flexible learning, it is important to see how processes of knowledge building and distribution of information contradict and complement each other. According to Wells (1999) information is second hand and can be distributed and shared. Information is an important part of the learning process. Wenger (1998, p. 220) points out the difference between information and knowledge: “Of course, availability of information is important in supporting learning. But information by itself, removed from forms of participation, is not knowledge”. Knowledge is personal, yet built in a social setting.

Wells (1999, p. 91) formulates the process of knowledge building thus: “Knowing starts with personal experience which amplified by information, is transformed through knowledge building into understanding, ...”. Wells continues by describing the relationship between information and knowledge (ibid.): “...the level of information has little or no impact on students’ understanding until they actively engage in collaborative knowledge building...” Nardi puts it like this: “Cognitive science has concentrated on *information*, its representation and propagation; activity theory is concerned with *practice*, that is, *doing* and *activity*, ...” (1996, p. 14). This view of knowledge building and distribution of information is central to the development of this study’s approach to flexible learning.

According to a socio-cultural view on learning, knowledge is built with tools. Language is the basic tool. Säljö (2000) formulated it this way: “The core of knowledge is speech and action in social context”. According to Bakhtin (1981) dialogue is basic in the use of language. The term “dialogical” is connected to Bakhtin’s (1981; 1984) explanation of how people use language. Bakhtin’s definition of dialogue has different levels. He has a general understanding, which is connected to human existence. Human life is based on communication and interacting. Bakhtin (1984) sees dialogue as a fundamental way to act in a society where learning is a dialogical process. At this level, Bakhtin does not recognise monologue. Despite this, the contradiction between dialogue and monologue is important to Bakhtin and formulated in terms of authoritative and passive understanding (1986). Olga Dysthe (2000, p. 62) puts these theories of Bakhtin’s into the classroom:

“On one hand, therefore, dialogue is a fundamental quality of all human interaction. On the other hand, it is a goal we must seek in the many different situations of interaction between people, such as in the classroom”.

Dysthe (2000) uses the term “polyphonic” for the dialogical aspect of education. She refers to the monologue as a situation where “the dialogic potential is not exploited” (ibid., p. 67). The interaction, however, between the teacher and student in this dialogical situation is not an equal and symmetrical process, but a process where the teacher supports the learner. The teacher and more experienced students play a leading part in the dialogical process. The terms of “dialogue” and “monologue” will be used according to Dysthe in this study.

A Case Study

This is a qualitative study in accordance with guidelines from case studies (Creswell, 2007; Yin, 2009; Stake, 2010), with emphasis on the guiding principles of Yin (2009, p. 2):

“In general, case studies are the preferred method when (a) “how” and “why” questions are being posed, (b) the investigations have little control over events, and (c) the focus is on a contemporary phenomenon within a real-life context”.

A research design of a case study will usually include five components (Ibid, p. 27) - a study question, its proposition, its unit(s) of analysis, the logic linking of the data to the propositions and the criteria for interpreting the findings. One of the basic differences in case studies is whether you have one or more cases, and whether you have one or more sources to investigate. The design for this case study is “embedded - single case design” (p. 39); i.e. one case - many sources. It emphasizes a theoretical foundation (Ibid): “... the better case studies are the ones in which the explanations have reflected some theoretical significant propositions”.

The question of this research is: How do teacher-training students, studying in a flexible education environment, build knowledge? The case is an online breakdown in a flexible learning situation, where the lecture was repeated asynchronously as a podcast. This raises another question: What do the students express as important in such a flexible learning situation?

The data sources in this study are the students’ chat messages in the breakdown situation, the students written reports and the notes from the final class discussion with the students. I assume that this study will show some

significant characteristics of flexible studies, which students express as important in the learning process.

The utterances of the students in their chat log, portfolio reports and notes from class discussion are summed up in categories. The analysis of these categorized utterances are the foundation for the understanding of what students express as characteristic of flexible studies. This study is also anchored in the theoretical framework suitable for these questions. The socio-cultural view on learning is a part of the construction of criteria for interpreting the findings.

The Online Breakdown Situation

This is a case study of a flexible learning situation in teacher training when a major digital tool broke down. A breakdown situation can be an excellent arena for learning something new and unexpected. Bødker (1996) finds breakdown situations to be excellent opportunities for studying learning processes and relates them to a “shift of focus” (Bødker and Grønbaek, 1996).

The flexible learning situation was organized in two classes of two half-day sessions at the students’ plenary sessions in 2011. The first session offered a lecture, instructions in the use of digital tools and discussions. Later, different educational resources were provided in the Learning Management System (LMS). This was followed by an online lecture with the possibility of organized student interaction. A working task was provided and the students were to develop a portfolio assignment. The teaching program concluded in a half-day session with evaluation, discussions and analyses. In this particular case, the topic was digital competence. The training program was rated as 3 credits. The training program was conducted in one class with 25 students and repeated in another class with 12 students. The online tool was an open source desktop videoconference system called Big Blue Button (BBB). This system has now been replaced with Adobe Connect.

At the first gathering in the classroom, the students were shown how to handle the BBB desktop videoconference system and the screen capture program Camtasia Relay. There is, however, a difference in a training situation that takes place in a classroom and one where the students are located far away, either alone or in small student groups. The sound broke down as soon as the online lecture started, making the audio content inaudible due to disturbing reverberations. Students’ efforts mostly failed when they tried to give comments to the teacher or speak to each other. However, the video picture of the teacher and students operated correctly along with the PowerPoint presentation and the chat function. The students used the chat system to comment on the online lecture and course material. After its failure as an online lecture, the lecture was produced as a podcast. It was recorded with the screen capture program Camtasia Relay. LMS Moodle was used to distribute the link to the podcast two hours later.

Collection of Data

According to Yin (2009), a case study should be founded on different sources of data, and recommends the use of three such sources. In this case, the sources were the students’ chat, portfolio reports and observation notes from the evaluation and discussion during the final session.

The chat system functioned well in the two classes in the breakdown situation. In the chat room, all of the students could discuss and comment on what was happening, and it gave the students better access to the teacher’s assistance. The chat developed as short responses and answers. Short forum-posts were in some situations toggled as threads to other posts like a debate. Thirty-five and twenty-two relevant entries were submitted in each of the two classes – all of them delivered in the breakdown situation.

The students were asked to deliver a portfolio assessment – twenty-one in one class, eleven in the other class. Relevant evaluations of the teaching and learning processes should be a part of the portfolio assessment. The students were asked to evaluate and reflect on both the use of synchronous and asynchronous tools and the cooperation among the students.

The third source was the notes of observations of the final discussion with the students from the second plenary session. These notes were written during the discussion process and completed afterwards. The notes reproduced the statements of the students and my own questions and understanding of what happened in the breakdown situation and the flexible learning process.

Analysing the Case

The analysis of data included a categorization of the students’ statements. These statements were located in chat logs, reports and classroom discussions. There was a need to sort and group these statements. The process of collecting data showed some central themes, which were of importance for students. The foundation for developing categories was the sorting process of the students’ statements connected to the sociocultural view of learning. The socio-cultural view of learning emphasizes the importance of tools where language and dialogue is a foundation in the development of knowledge. It also points out the differences of knowledge and information in the learning process.

Connecting the framework of socio-cultural theories of learning to the collection process of data, developed these favourable categories:

- *Quality of tools*
- *Availability of teaching*
- *Various processes of learning*
- *Various forms of communication*
- *Practical relevance*

These categories were used to sort the students' statements in order to emphasize that what students say matters in their flexible learning situation. The categories connected the statements of the students to characteristics of the development of flexible learning.

The students' statements in the portfolio, chat logs and observation notes, showed different patterns and focuses, which were grouped in several distinct categories. These categories were sources for finding essential characteristics of the flexible learning environment. The portfolio reports included reflections of the students' critical judgments of the online sessions. In the classroom discussions, different opinions and ratings confronted each other. In chat room dialogues, there are expressions that contradicted or corresponded with other chat expressions or statements in the other sources – like Lars (C1)¹: “This is rubbish. Is it possible to learn teaching by looking at video?”² as well as Marit in the Report (R2): “I think this communication on video is an interesting experience”. The breakdown in quality audio content was criticised by all the students. Frustration of the communication process and lack of practical relevance was expressed like this in the chat room. Per (C3): “This is hopeless. Even though we see each other and are chatting, we are losing content. Is this a good way to educate us? Is this relevant for our practical teaching?” Irene answered (C4): “I want to discuss this when we meet at campus”. However, there were also students who were excited to participate in such a new and challenging teaching situation. The students reflected on the quality of the tools. In the portfolio documents, the availability and use of tools is a main part of the students' evaluations. Students claimed there were both pros and cons using the Big Blue Button including the presentation and chat system and then Camtasia podcast as a replacement. Anne expressed this in the portfolio report (R5):

“Another great benefit of posting the lecture in Camtasia is that we can repeat it at any time and we are more flexible. We didn't have this opportunity in the BBB, but we cannot ask the lecturer questions in Camtasia, or get the opportunity to participate actively as a regular classroom lecture. Both types of lectures have clear advantages in different situations”.

Anne's statement corresponded with notes from the evaluating meeting (N6): “Although Camtasia gave us the opportunity to repeat the lecture when it suited us, the class lost the possibility to discuss the main issues with the teacher present. We should use different systems in different situations.” It is important for the students learning process to discuss the lecture material. They give a lot of attention to the possibility of repeating the podcast when and where they desire, as well as being able to discuss topics and participate in online dialogues.

Some students described their personal situation when studying. Distributed teaching makes study possible for many students who would be unable to continue their education if they were required to be continuously present on campus. The study situation was closely connected to practice in local schools. My notes confirm that students appreciate the local angle of the study. Monika (N7): “I could not have been a student without the possibility of living at home with my family and earning some income from teaching locally.” This statement epitomizes the importance of this kind of study for these students.

Some Characteristics of Flexible Learning

The analysis of the content in the categories shows some distinguishing characteristics of flexible learning. The student observations and statements were based on their experiences during the gatherings as well as the Internet support and local learning situations. The students' statements (R2; C4; N7) indicate the importance of different learning environments and how the Internet based online lecture was an insufficient learning environment (C3). It also raises the question (C1) of how do we learn to teach? The students' expressions in the breakdown situation (R5) showed some characteristics of the tools and how important alternative distributions of content are. In their portfolio reports, the students formulated (R5) the pros and cons of the Camtasia podcast lecture. Similar reflections can also be found in the summary of the (N6) classroom discussions. Different situations require different tools. Even though

¹ Quotations are numbered continuously and sources identified by: C for Chat, N for Notes and R for Report

² The researcher has translated this and other Norwegian citation to English.

the Camtasia lecture was well prepared and the quality of sound was good, the students still missed the possibility of interacting online with the teacher and other students (C1). How, where and when indicates central questions for the students.

It is fruitful to summarize these statements as characteristics of some flexible learning processes and then connect them to the socio-cultural view of learning. These students appreciate different learning arenas and diversity of tools. Internet alone is not sufficient for these teacher-training students. Internet was a tool for information in their study-situation. They participated in hands-on training in local schools to build knowledge of teaching and they had arenas of dialogue to support this process. They discussed the benefit of being online together with other students and teachers. But they also saw the pros of an asynchronous form of communication like flexible access to repetitions. Tools like the LMS and podcasts developed possibilities for flexible studies. The most important tool for learning is the language. The students discussed the importance of dialogue and saw the limitation of the teacher's monologue on podcasts. Mixed with the dialogue during gatherings and participation in the in-service teaching, shared information contributed to the knowledge building in this flexible learning situation. Some characteristics of flexible learning are anchored in both the analysis of data and the theoretic framework. The students expressed these characteristics of their flexible learning processes:

- *Internet based and internet supported*
- *Synchronous and asynchronous distribution*
- *Dialogical and monological communication*
- *Distribution of information and building of knowledge*

These characteristics are suitable to describe essential parts of the flexible learning process. In this pilot project there are different communities linked to the processes of knowledge building. The local student communities are *Internet supported, not Internet based*, meaning that there are more learning arenas available to them than just those located on the Internet. The Internet is a tool for interacting within and between local student communities. The tools for this communication can be both *synchronous* and *asynchronous*. There is an asynchronous distribution of information. There is also a synchronous interaction between the teacher and local student communities to support the processes of *dialogue*. The distributed information can be a part of the dialogical knowledge building within the student communities.

Conclusion

This study discusses how the term flexible education also includes the development of distant asynchronous and synchronous education on the Internet. The study is anchored in a socio-cultural view of learning. The focus of this theoretical framework is community, division of labour, rules and tools. The students' building of knowledge is described within this framework.

This is a case study of a flexible learning situation where a major tool of online teaching broke down. Certain characteristics of the flexible learning processes emerge from the students' statements during the situation and their observations afterwards. These characteristics can describe processes of flexible education. Flexible education can be Internet based or Internet supported. Flexible learning processes can be developed with synchronous and asynchronous tools. Learning processes involve various methods of communication where dialogue is appreciated. Dialogue is central part of the students' knowledge building. These characteristics are connected to distribution of information and students' knowledge building. These characteristics also describe how students build knowledge in flexible learning situations. The characterized processes support different purposes and complement each other.

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