

Teachers' beliefs about professional development and the use of collaborative online tools in higher educational settings

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Abstract

Teaching in higher education beyond the boundaries of face-to-face education is an evolving practice including the integration of various technologies to support collaboration between learners and teachers. From a historical perspective the integration of such technologies in this practice has afforded different time- and location-related conditions for collaboration. This development has brought new conditions for the practice of teaching in higher education. From being a practice mainly located at the university, teaching is possible to occur elsewhere; e.g., on the move, or from the home setting. It has paved the way to introduce so called blended learning practices of teaching in higher education. Such practice has been an emerging trend in the 21st century with an overall impact on the design of university courses. Applications, devices and networks that initially were used in experimental distance education have later become natural parts of mainstream education, with blended learning as a standard concept in higher education. The rich plethora of information and communication technologies applied as tools to mediate learning and support teaching have created a need for teachers' professional development. The aim of this study is to present and discuss university teachers' perceptions and beliefs about how the supplementary training should be organised. Data were gathered by semi-structured interviews at a department for Computer and System Science where all seven interviewees teach in blended synchronous educational settings. The empirical material were analysed inductively by applying a thematic analysis method. Findings show that all courses have a basic common toolbox as well as an extended specific toolbox that both are continuously changing. This can be stressful and the formal teacher professional development is far from satisfying. Teachers cope with problems by consulting the collegium, a peer group where colleagues share experiences and assist each other in problem solving. Despite the constant pressure many teachers have creative ideas for a further development of the blended synchronous learning concept. Many of the teachers in this study see the continual attempts to implement these tools and experimenting with these tools in their teaching as possibilities in their teaching as well as a source of professional development.

Keywords

blended synchronous learning, collegial learning, online collaboration, teachers' beliefs, teacher professional development

Introduction

Teaching in higher education beyond the boundaries of face-to-face education is an evolving practice including the integration of various technologies to support collaboration between learners and teachers. From a historical perspective the integration of such technologies in this practice has afforded different time- and location-related conditions for collaboration. Early synchronous trials, including mail and postcards, and asynchronous trials, including Radio and TV, were quite slow to connect people and therefore rather ineffective as tools to support teaching and mediate networked learning. Later, networked technologies such as telephone conferences, video conferences and computer conferences were introduced as tools to support teaching and mediate students learning. This development has brought new conditions for the practice of teaching in higher education. From being a practice mainly located at the university, teaching is possible to occur elsewhere; e.g., on the move, or

from the home setting (Jaldemark, 2008). It has paved the way to introduce so called blended learning practices of teaching in higher education.

Blended learning has been a rapidly growing phenomenon and as highlighted by Garrison and Kanuka (2004) the adoption of blended learning in higher education is an inevitable fact. Blended learning can broadly be defined as “the convergence of online and face-to-face education” (Watson, 2008, p. 1) but at the same time it is important to include the dimension of technology and media use (Picciano, 2009). Blended learning can further be divided into blended asynchronous learning based on the idea of 'anytime, anywhere', and blended synchronous learning. This study had a focus on blended synchronous learning defined as “a learning method that enables online students to participate in classroom learning activities simultaneously via computer-mediated communication technologies” (Wang, Quek, & Hu, 2017, p. 2).

The department where the study was conducted has a history that started with blended asynchronous learning in the mid-1990s that transformed to pure face-to-face education at the end of the millennium. Later in 2003-2005 when fewer local students applied for computer science programmes the department switched back to blended asynchronous learning. However, with the identified problems in blended asynchronous learning such as low motivation (Keller & Suzuki, 2004), impersonality (Kear, Chetwynd, Williams, & Donelan, 2012) and the lack of social presence (Han, 2013) such changes in the educational setting are challenging for teachers.

This shift of practice has increased the need of teacher professional development since the various teaching and learning modes are depending on different tools. There has also been an ongoing technological development where applications constantly are updated or replaced. How does the current situation look from the teacher perspective? The aim of the study is to present and discuss the interviewed teachers' perceptions and beliefs about how the professional development should be organised.

Method

The study was conducted as a qualitative cross-sectional study where data were collected from a representative subset of teachers at a specific point in time. Most cross-sectional studies have a quantitative approach using questionnaire or structured interviews, while the fewer qualitative studies tend to use semi-structured interview (Bryman, 2006). The advantage of a qualitative approach, using a purposive sampling, is the possibility to gather quality information and important insights by a selection of people having the right expertise and experience in the field (Creswell, 2014).

Data were collected in 2017 from semi-structured interviews with seven university teachers (four male and three female), that all are subject matter experts and teachers in courses given in blended synchronous mode. They all work at a department of Computer and Systems Science and all interviews were audio recorded and documented by rich and detailed written notes. Interviews were in general around one hour long and based on a question scheme, but with improvised follow-up questions when interesting topics were brought up. Informants have been kept as anonymous as possible and with informant consent according to the guidelines that are recommended by the Swedish Research Council (2017).

The study is part of a larger project involving interviews teachers from two other departments at the selected university, the Department of Education and the Department of Science Education and Mathematics. However, the results from these interviews need further analysis and are therefore not included in this short paper. Collected data have been analysed in an inductive data driven way according to the thematic analysis described by Braun and Clarke (2006). A six step method with a focus on getting familiar with data, generating preliminary codes, identifying patterns and themes, review the themes, define and name categories, and presenting analysis. Finally, parts of the findings have been discussed with colleagues at pedagogical seminars.

Findings and discussions

The obvious main finding was that all seven interviewees mentioned the importance of *The collegium* and its central role for idea sharing, problem solving and continuous professional development. Other found main themes were *The software toolbox* and *Teachers' beliefs*. The relations between main themes and sub-themes are depicted below in Figure 1.

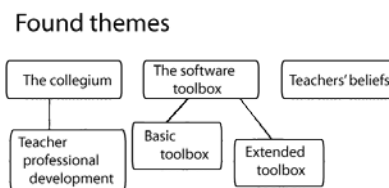


Figure 1. Found themes and sub-themes

The Collegium

This theme is the most obvious and the one that was spontaneously brought up by all respondents. To have a collegium where issues can be discussed and ideas can be shared gives security and is seen as an important complement to the official support channels. One respondent mentioned that “our IT Helpdesk seldom has any solutions” and that “I learn about new tools by myself and together with the collegium”. The way ideas are shared and problems are solved collaboratively differs from the findings in a similar study at another Department of Computer and Systems Science (Mozelius & Rydell, 2017). The collegium was also described in some answers as a phenomenon with sub-groups or sub-collegia.

Teacher professional development

This theme has a clear relation to the previous theme and one way of disseminating knowledge and skills in the collegium is by pedagogical seminars and a respondent highlighted that “you need to listen to other colleagues reasoning”. In the rapid technological development there has always been a need for pedagogical development as well. Several respondents pointed out that there are no clear distinctions between new technology and new pedagogy and that these phenomena are intertwined. There have also been a number of shorter courses given by the university, but one of the respondents claims that “the discussions are on a rather abstract level, for our daily use we need more hands-on training”. Another teacher thinks that “it’s the continuous tinkering and experimenting that leads further”.

The software toolbox

Both in the past and in the ongoing technological development learning platforms and software tools are constantly updated or replaced. The two respondents who have worked for more than 20 years at the department needed some time to remember all the learning management systems (LMS) and communication tools that have been used through the years. The shift from blended asynchronous learning to blended synchronous learning has emphasised the need for reliable and user-friendly rich media communication tools. Most respondents classified the basic toolbox as a 'Top-down thing' provided by the university, while the extended toolbox was described as a bottom-up product with roots in the collegium or in a sub-collegium.

Basic Toolbox

The basic toolbox is general for all courses with the Moodle LMS and the Adobe Connect web conferencing system, complemented with Skype and e-mail for synchronous and asynchronous communication. Moodle is seen as reliable, but limited considering communication channels and features for synchronous activities. Adobe Connect, on the other hand, is generally appreciated for the user-friendly way sessions can be recorded and the 'break-out room feature'. With the use of break-out rooms larger online student groups can be divided into smaller units like campus students for many years have been divided in to so called 'bee hives' for grouped peer discussions.

However, all respondents reported negative experiences from the Adobe Connect system and as one of the respondents expressed it: “it’s a system that really can support your teaching, but also make the whole session fail”. Another respondent recalled that “during periods there have been huge technical problems with the Adobe Connect software”. Some respondents also wanted to include tools like Doodle (to book appointments) and Camtasia studio (for video recordings) in the basic toolbox.

Extended toolbox

Every specific subject has its own specific needs and as programming courses have a need for integrated development spaces and prototyping tools, courses on project management have special needs for planning and communication tools. Too many tools and techniques were brought up to be listed here. The tools that have a more general interest should be part of the further analysis and be compared to the tools that are used at other departments.

Teachers’ beliefs

This category also needs further analysis, but the general opinion seems to be that “it’s improving. It’s getting better” as formulated by one of the respondents, and based on the answers it could be claimed that tools supporting blended synchronous learning were more problematic and definitely more limited just a decade ago. As examples of more visionary beliefs there were also ideas such as “a common and never ending real time whiteboard”, and the concept of online virtual lab spaces.

Conclusion

Findings indicate that there are challenges for teachers to handle the continuously changing situation in blended synchronous educational settings. Today's teacher professional development needs more than formal university-provided training. Comparing with earlier studies different departments seem to have created different models for supplementary training, where the absence of a strategy can leave teachers by themselves in a problematic state of confusion (Mozelius & Rydell, 2017). With the rich plethora of tools and techniques today the recommendation is to create a networked solution where teachers can get support when they get stuck. The main finding in this study is The Collegium, a networked and sub-grouped model for collegial learning. Several ideas in The Collegium and its function as a bedrock for networked professional development show similarities with the concept of a Community of Inquiry as described by Garrison et al. (2010). The Collegium can be seen as the communication medium for educational experiences that sets the climate, selects the content and supports discourses (Garrison et al., 2010). Finally, teachers are generally optimistic and believe that the technological development will lead to improved blended synchronous educational settings, and brought up idea of online virtual lab spaces might soon be reality (Richter & Boehringer, 2016).

Future work

The results presented here should be compared to the results from interviews conducted at the Department of Education and the Department of Science Education and Mathematics. All interviews at these three departments are based on a common interview question schedule. Future work therefore needs to include further analysis of both the included interviews and the excluded interviews. This work should include a reanalysis to validate or change the categories found in the preliminary analysis as well as reaching a deeper level of understanding of teachers' perceptions and beliefs about how professional development should be organised.

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