

Four pedagogical models using video as a tool for learning in a distance teacher training program context

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Abstract

L'Università di Sherbrooke offre alcuni programmi di formazione per insegnanti completamente online. Sebbene l'uso di video nei programmi di formazione degli insegnanti sia attualmente oggetto di ricerca, i modelli pedagogici attuati dai formatori in Québec sono ancora scarsamente esplorati. Il presente articolo introduce la prima fase di una ricerca che mira a comprendere – in un ambiente di apprendimento a distanza – l'evoluzione delle interazioni tra insegnanti nell'analisi di video. L'articolo discute in particolare le caratteristiche dei modelli pedagogici attuati da quattro formatori che hanno partecipato alla ricerca. In primo luogo presentiamo l'analisi di questi modelli. In secondo luogo presentiamo l'analisi delle specifiche attività che utilizzano il video. Infine, una tipologia di interazioni online (Dumont, 2007) ci consente di caratterizzare il ruolo dei formatori. L'articolo si conclude con una riflessione sull'efficacia dei modelli pedagogici descritti e ulteriori miglioramenti da considerare.

Parole chiave: video; formazione insegnanti; educazione online; forum; instructional design.

Abstract

The University of Sherbrooke offers online teacher training programs. Although the use of video in teacher training programs is a subject of current research, pedagogical models implemented by teacher trainers in Québec are still sparsely explored, especially in the context of distance learning. This article introduces the first step of a research that aims to understand – in a distance learning environment – the evolution of the interactions between teachers analyzing videos. The article specifically discusses the characteristics of pedagogical models implemented by four trainers. The analysis of these models is first presented. We secondly present the analysis of the specific activities using videos. Then, a typology of online interactions (Dumont, 2007) allows us to characterize the roles of the trainers. The article concludes with a reflection on the effectiveness of the described pedagogical models and further improvements to consider.

Keywords: video; teacher training; online education; forum; instructional design.

1. Introduction

More and more French speaking universities offer fully distance teacher training programs (Garry, Karsenti, N’Goy Fiana & Baudot, 2010). The Master in secondary education of the University of Sherbrooke (Québec) is part of this trend and offers a 100% online program. Among the registered students, 80% of them follow a qualifying path, which allows them to obtain the teaching license recognized by the Québec Ministry of Education (MELS) and gives them the right to teach in secondary schools. These students, about 500, are already hired in secondary schools (they have a temporary teaching license) and have a bachelor’s degree in a relevant subject area but have not followed any recognized teacher training in the Québec Province. The development of twelve professional competencies targeted by the Ministry of Education (Martinet, Raymond & Gauthier, 2001) is a central goal of this Master as well as the understanding of the competency approach based curriculum that is implemented since 2001.

According to recent researches, videos of authentic classroom situations used for teacher education in a perspective of modeling practices seem to have a positive effect on the development of professional skills allowing learning at different levels: emotional, social, cognitive and psychomotor (Yung, Yip, Lai & Lo, 2010). The type of training technique called modeling (Schunk, 2001) and using videos of examples of practice goes beyond a simple exemplification of teaching practices and engages students in a complex and reflective analysis approach (Santagata & Guarino, 2011). We have also observed that teachers demonstrated, after observing such videos during an autonomous online training, a better ability to define and exemplify the targeted professional competence, a willingness to make significant changes in their own practice and a greater self-efficacy belief (Meyer, 2010).

Although more and more researches and training setups incorporating videos of practice are implemented (Blomberg, Renkl, Sherin, Borko & Seidel, 2013), teacher learning in such contexts remains largely unexplored, particularly in Québec and even more in contexts such as distance teacher education. This explains why the trainers (who can be in Québec either professors or lecturers) seem to rely more on their intuitions to guide online instructional tasks using video than on scientific knowledge. A recent research in our university tends to confirm that tendency (Meyer & Bourque, submitted). These observations and studies have led us to carefully observe four completely online courses of that Master. The objectives of this research are to understand and describe the evolution of online interactions between student teachers watching online videos of teaching practices as well as the role of the trainers in such a context.

We focus in this paper only on one dimension of the objectives, which is the description of the pedagogical environment set up by the trainers. This article addresses therefore, at first, the problem circumscribed to this topic. In a second step we present the conceptual framework on which we have relied during this research. Thirdly, we present the detailed pedagogical models of these four courses focusing mainly on the characteristics of activities integrating videos of practice. The article concludes with a reflection on the effectiveness of the described pedagogical models and further improvements to consider.

2. Problem

Recent American research (van Es & Sherin, 2008; Santagata, 2009; van Es, 2012) tell us that interactions between teachers participating in “video clubs” evolve, perceptions change progressively with each the meetings and that attention changes from a target centered on the teacher and his actions towards a target centered on students and their learning process. Recurring meetings of a group of teachers during which rich discussions accompanied by a trainer mediating interventions contribute to this development. Furthermore, our own research suggests that the vicarious effect (Bandura, 1997) produced by the observation of practices of experienced peers during an online autonomous training, contributes to a positive effect on in-service teachers’ self-efficacy beliefs, their intentions to change practice and their knowledge (Meyer, 2010). Our work does not, however, inform us on the processes occurring during these courses and contributing to learning and to the effects observed.

The work of Yung and colleagues (Yung, Yip, Lai & Lo 2010) tells us that the observation and analysis of videos of practice are skills that develop gradually and require intervention of a trainer whose presence, even virtual, is very important. Given the complexity of the role of the online trainer to support exchanges and interactions between student teachers (Dumont, 2007) and the fact that learning occurs through different cognitive processes that are influenced by the environment and the social context in which a person is, the practice of reference, the observations he can do, the models that are proposed, the mediation offered by a trainer or a more experienced peer, the learner’s ideas or the expectations that he formulates (Wang & Kang, 2006), we believe it is important to understand the evolution of the teachers’ capacities to analyze observed practices, according to peers’ or trainer’s interventions, to the contextual elements or to the characteristics of the training. To understand this evolution, one of the questions to which it is necessary to answer at first is this: “What are the characteristics of the online courses developed by the trainers at the University of Sherbrooke who exploit the videos in the context of online training for future secondary school teachers?”.

3. Theoretical framework

The situations of teacher education that we study in this research are characterized by the fact that they are completely online. This means that students and teachers never gather in one place at one time. All learning activities, interactions and meetings are online, synchronously or asynchronously using all the features offered by the web (Ko & Rossen, 2010). Of course it offers new educational opportunities but also greater diversity and greater possible complexity. Trainers have to plan their courses online: “If you teach exclusively online, it involves recasting your entire class in an online shape. [...] if you want the resulting class to be a coherent and effective learning experience, you need to think about purposeful design and development of your course” (Ko & Rossen, 2010, p. 46). This complexity forces us, as researchers, to understand the relationship between the various components of an online course in order to better study the educational situations lived and their effects on learning.

As part of the literature on instructional design of online courses, Paquette (2004) suggests to think the design of a course thanks to four distinct interconnected axes: the axis of knowledge and competencies (i.e. the axis to define learning targets), the pedagogical axis (i.e. the axis to define the strategies and approaches that can be used to

help reach the learning targets), the media axis (i.e. the axis to define the media and technological resources that are used in the course) and finally the axis of diffusion (i.e. the axis to define how, when and under what economic model students will have access to all resources and online activities). Traditionally, this method is used in the planning of educational activities (Nizet & Meyer, 2014), however, through this paper, we focus more specifically on three of the four axes to understand afterwards what were the choices made by the trainers.

First, from the standpoint of the axis of knowledge and competencies, we believe that knowledge built by the teachers are of different types. Malo (2000) distinguishes five types of knowledge: disciplinary knowledge, curricular knowledge, knowledge of professional training, pedagogical knowledge, experiential knowledge and pedagogical knowledge of the subject. However, the Technological Pedagogical and Content Knowledge (TPaCK), developed by Mishra & Koehler (2006), which was based on Shulman's (1986) Pedagogical Content Knowledge (PCK) seems to better fit in this work since the trainers we observe all use technology in a specific manner. The TPaCK model for teacher knowledge is described in detail, as a complex interaction among three bodies of knowledge for teachers: content, pedagogy, and technology. The interaction of these bodies of knowledge, both theoretically and in practice, produces the types of flexible knowledge needed to successfully integrate technology use into teaching.

Secondly, from the standpoint of the educational axis, we consider that the intervention of the trainer is essential to support students' engagement in their learning. In this regard, Dumont (2007) distinguishes four types of support that the trainer can offer to students during their learning process (which role can sometimes be played by peer student): psychological and psychosocial support, methodological and organizational support, pedagogical support, and technical support. Moreover, as pointed out Wang and Kang (2007), there are three main factors that may influence the engagement of learners, and by extension their learning, in the context of online learning: social factors (personnel attributes, context, community), emotional factors (feeling of self, feeling of learning atmosphere, feeling of learning process) and cognitive factors (achievement goals, prior knowledge/experience, cognitive/learning style).

Besides these elements to which we believe that a trainer should pay attention when responsible of an online course because they contribute to the achievement of the learning goals mentioned previously, he must also include pedagogical activities centered on students' learning. Yung et al. (2010) identified three main pedagogical activities that accompany the use of videos and foster various learning: critical thinking, meaningful comparison and productive discussion. Critical thinking leads the future teacher to question the practice observed, to problematize this practice, to theorize it, to contextualize it and to propose a contextual adaptation to his own practice justifying the expected results. By meaningful comparison, Yung and colleagues (*ibidem*) suggest that teachers make comparisons between different practices and theirs or between different external practices. By productive discussion, they mean a discussion, using the features of collaborative technologies, leading to the completion of specific tasks requiring negotiation of meaning.

Regarding the intentions surrounding the use of videos, Janík et al. (2009) conducted various studies allowing them to distinguish three main types of intentions when videos are used during teacher training sessions. The first type of intention, type A, involves the illustration of classroom practices, which means, for example, operation of videos to illustrate theoretical principles outlined by the trainer. The second type of intention, type

B, is the use of video to develop teachers' reflection. So when student teachers observe videos, they learn how to question themselves about their practice, they reach a better understanding, they learn how to explain what they observe using theoretical knowledge built previously. The third type of intention, type C, involves the use of video to guide and mentor teachers in their own practices. For example, when a teacher observes a video of himself when he teaches in order to discern the actions he carries out and to make him think about possible improvements in his practice.

Thirdly, from the standpoint of the media axis, we believe that the selected videos, the technologies and the resources available to students help to characterize the courses that we want to describe here. Of course, among the multimedia resources, those subject to specific attention in this research are the videos of practice. These videos are sequences of images taken in classes for one or more sessions (Meyer, Bourque & Lampron, 2013). They are distinct from videos of simulated situations where actors bring into play a predefined scenario and video animation (*ibidem*). The videos can be raw and represent the class situation in its initial state, or edited, that is to say, a cutting was made from the initial situation to shorten the sequence and to highlight some rich moments (Meyer, 2010). The videos can show teachers participating in the training or unknown teachers as it is mostly the case in the courses which have been the subject of this research.

Finally, it is important to note that among the tools of the online learning environment used by the trainers, the discussion forum is the tool that is usually the most used. Interactions between students take place, in fact, mostly in discussion forums. However, interactions can take place in different asynchronous tools offered by the different platforms used or in synchronous tools like web conferencing Henri and Basque (2003) explain that communication during online exchanges, is a "process that leads the learner to express ideas and share them with the group, to make connections between ideas (his and those of others) in order to generate new ideas and to organize ideas (his own and those of others) to make sense and construct knowledge" (*ibidem*, p. 36). The choice of technological tools is therefore of a very important feature for a course.

4. Methodology

In terms of methodology, we have implemented a qualitative research within an interpretive paradigm (Lessard-Hébert, Goyette & Boutin, 1990), where subjectivity is an integral part of the process. It is very important for us to take into account the evolution of each individual participant in accordance with his point of view and representations, allowing a generalization starting from each case studied and a delimitation of the learning situations integrating multiple interconnected elements.

The participants were four trainers who give fully online courses through the Moodle platform. These courses are part of the master in secondary education (MES) at the University of Sherbrooke and they are required for graduation.

We collected various data using conventional methods: semi-structured interviews with trainer, a full access to the online courses embedding all the instructions and resources for the learning activities, productions and student evaluations, and finally all the exchanges and interactions that occurred in different editions of the same course. Questions asked to the trainers were about the pedagogical engineering of the course and of the learning activities using videos (structure, type of tasks, intention...), the characteristics of the videos used, the online interactions during the course and specifically during the activities

using videos, the students engagement and participation, and finally the type of teaching and mediation offered. The data that were relevant to this specific topic of this article were the transcript interviews. The other data were used mostly to confirm our understanding of the pedagogical engineering. Data analysis was qualitative and inductive to make room for the emergence of categories. However, different theoretical models discussed in the previous section guided the coding and the interpretation of data. We used the instructional design model (Paquette, 2004) to identify learning objectives, pedagogical structure, and technological specifications. Then, based on the work of Mishra and Koehler (2006), we categorized the different knowledge mobilized by the trainers. Finally, we used the model developed by Wang and Kang (2006) about online engagement and the one developed by Dumont (2007) with regard to the type of support an online trainer can provide to categorize elements of the vision that the participants have about their role in such a particular distance education context.

Thanks to two research assistants, data analysis was first done using a phenomenological examination of the data and then using conceptualising categories (Paille & Mucchielli, 2010). To reduce the bias of subjectivity in the analysis, the data were analyzed by each assistant individually and then pooled and finally confronted with the principal researcher. The interrater agreement was rather high ensuring process reliability.

5. Results

This section of the article presents the main results. First we present the designs of content and of pedagogical specification of the four participants. Then we present the teaching methods and videos chosen by the participants for their course.

5.1. Designs of content and of pedagogical specification

Fabien's course (Figure 1) has two main learning objectives are: 1- to enable students to get to know all the professional competencies (12) presented in the repository issued by the Ministry of Education (MELS) and 2- to introduce them to the specificities of the process of qualifying master degree or regular curriculum.

Fabien has divided the course in 5 modules, which are gradually revealed with the advancement of the session. He aims a pedagogical alignment between resources, preparatory activities and evaluation situations. He explains that every learning situations result in feedback from peers. In the forums, Fabien says he formulates specific guidelines that are used to frame discussions. He wants to give students the necessary tools to help them develop an effective working method to learn online.

The objectives of Carole and Maurice are to get students to know the main educational trends (social constructivism, cognitivism, humanism and behaviorism) and to assess their current influence in the teaching practice.

Maurice (Figure 2) has also divided his course in different modules. In the forums, this trainer offers a framework of specific questions that are used to initiate dialogue.

Carole's course (Figure 3) is composed of 5 modules revealed gradually as the course progresses. For her, forums allow collaborative learning and effective communication of information as everyone has access to the same content. Carole explains that her actions take place mainly in the forums. She also prefers that interactions between students are

public so that everyone can participate in the learning process of everyone. She provides frequent comments to encourage participation and to motivate students to interact. She provides some clarifications once she sees general trends emerging. She considers her role is to supervise learning, to question students and to follow up. She says she guides thinking, but avoids giving the answer immediately.

In addition, Carole attaches great importance to the emotional dimension, because she believes that it has an impact on student engagement. Her philosophy is that each person should feel concerned.

TITLE	« Introduction to in-service teacher training programs »
Design of Content	Competence 11 and 8 (C11-8)
Design of Pedagogical Specifications	Socioconstructivism – Cognitivism Observation to develop teacher thinking (Janik et al., 2009)
Design of Materials	Forums: non mandatory Emails – Videos – Readings – Cmaps
Design of Delivery	Moodle – 100% online – credited and mandatory
Types of video	9 good examples of practice from http://zoom.animare.org (he made some of these videos). Various topics
Video use	3 steps observation. Progression in observing videos (take notes → analyze → reflect) + connexion to personal practice and understanding
Types of support	Quite present: psychological support; organizational support; educational support; (technical support)

Figure 1. Synthesis of Fabien's model.

TITLE	« Socioconstructivism & contemporary pedagogical approaches »
Design of Content	« the goal of my course was to get them to understand that socioconstructivism is a challenge, it gives results»; C3-4-11
Design of Pedagogical Specifications	Socioconstructivism and sociocognitivism 1 of 5 modules uses videos
Design of Materials	Forums: mandatory and evaluated Emails – Videos – Readings – Cmaps
Design of Delivery	Moodle – 100% online – credited and mandatory
Types of video	20 (among 50) good examples of practice from http://zoom.animare.org (he made these videos) – One topic: <i>integration</i> project
Video use	Application of theoretical concepts (5 approaches) to video segments + identification of specific elements and illustration of own understanding
Types of support	Rarely present, only when it is strategic: (psychological support); educational support

Figure 2. Synthesis of Maurice's model.

« Socioconstructivism & contemporary pedagogical approaches »	
Design of Content	« to know and compare the main contemporary pedagogical approaches. ... to analyze and test principles and approaches of planning and intervention » C3-4-11
Design of Pedagogical Specifications	Socioconstructivism and cognitivism 1 of 5 modules uses videos
Design of Materials	Forums: mandatory and evaluated Emails – Videos – Readings – Cmaps
Design of Delivery	Moodle – 100% online – credited and mandatory
Types of video	20 (among 50) good examples of practice from http://zoom.animare.org (total of 180 min of videos) – One topic: <i>integration</i> project
Video use	Application of theoretical concepts (5 approaches) to video segments + identification of specific elements and illustration of own understanding
Types of support	Very present and supportive: psychological support; organizational support; technical support, educational support

Figure 3. Synthesis of Carole's model.

« Didactic knowledge in science and technology »	
Design of Content	« the purpose is to not confuse school knowledge, curriculum content and the scientific content »; C1-3-8
Design of Pedagogical Specifications	Conceptual change
Design of Materials	Forums: mandatory and evaluated Emails – Videos – Readings – Cmaps
Design of Delivery	Moodle – 100% online – credited and mandatory
Types of video	1 good example of practice + 1 non exemplary practice from private bank of videos
Video use	Observation and analysis of teaching situations (teacher) learning (student) + description and anticipation
Types of support	Extremely present, questions a lot and interacts a lot: psychological support; (organizational support); educational support (error is fundamental and seen as an opportunity)

Figure 4. Synthesis of Lise's model.

Finally, Lise (Figure 4) targets the following learning objectives: “to differentiate academic knowledge, knowledge required by the MELS and scientific knowledge”. She also wants students to question their conceptions and their teaching based on the concept of didactic transposition. Lise explains that the different parts of her course divided in modules follow a spiral progression. The first part presents a general view of the whole

material. The following modules provide successive deepening of the subject. For her, the asynchronous aspect complicates discussions with students. Lise says that when she intervenes, students are probably already somewhere else in their understanding.

5.2. Teaching methods and videos

Based on the MISA model developed by Paquette (2004) and on the model of Yung et al. (2010), we will now describe the teaching methods related to the use of video within the courses of the participants.

When choosing videos, Fabien ensures that student can recognize elements of his own practice even if these videos intend to present good practices, in order to prevent that student's zone of proximal development is too far. He also wishes that the students become aware that it is possible to observe a practice from different angles.

In the first activity, students watch videos of three different class situations. For Fabien, it is an introduction and a vocabulary appropriation exercise. Students are invited to share their thoughts in the forum. In the second activity, based on their readings, students are invited to identify specific components of the curriculum. Fabien asks students to share their answers in the forum and does not require them to respond to their colleagues. He was careful to select videos from three different domains to reach more students and connect to their field. The third activity focuses on learning theories. Fabien asks students to define in which learning paradigm the teacher observed is and to qualify student learning. Once again, students are invited to share their answers in the forum.

With Maurice and Carole, students have access to twenty videos, which illustrate interesting implementations of different socio-constructivists approaches. The videos, which last about five minutes, focus on the program of Integrative Project. They illustrate between thirty and forty pupils' projects, sometimes commented by the pupils themselves, teachers and various school actors. In the forum, Maurice and Carole ask students to visit the bank of videos and to choose excerpts illustrating the characteristics of the instructional approaches studied. Then, they justify their choices based on their readings. Carole considers that in order to supervise well her students, knowing well all the videos is helpful. Maurice has chosen videos and has even contributed to their design. Carole has only approved this choice.

Lise uses two videos. One is used to illustrate an example of practice that confronts students' conceptions. For ethical reasons, Lise has decided to reconstruct the content of the video. Students have access to the plan of lesson of the teacher, a transcript of an interview conducted with him before and after the lesson, photos of students trying to achieve the experience and the teaching materials used. The video lasts only a few seconds and illustrates the concept of pressure. The second video shows some limitations of teaching practice in terms of didactic transposition. Lise chose this video, because the analysis of the practice shows that the teacher does not control the didactic principles underlying the concept he teaches. Lise asks students to analyze the practice and to identify tasks performed by the teacher and students. She also asks them to identify how the teacher considers the existing knowledge of his students. For Lise, the video is an essential teaching and learning tool. She explained that without it, she would not have been able to achieve her training objectives. Finally, she recognizes that the perspective of the designer of the video can limit the use of it in the classroom. She says she found it difficult to select the appropriate sample.

6. Conclusion

In this article, we presented four training courses. All the differences identified have the potential to influence the quality of learning carried out in the activities exploiting videos of practice. All these courses' characteristics are factors to be considered in the next steps of our research that will be to study the interactions occurring in these courses while using videos of teaching practice.

It also raises some questions that will be interesting to consider later in our work. Thus, the trainers share a very elaborate discourse about their course and present rich pedagogical intentions, but are they consistent with what is really going on during the interactions in the forums? Blomberg et al. (2013) remind us that a certain misunderstanding can sometimes appear since videos lift up some obstacles: difficulty of interpretation, proper selection, match videos with training goals...

Another element to watch carefully is the mandatory aspect of the discussion forums. What effect does it really have on learning and interactions when using videos?

What about participation in video editing and selection of videos? The trainers we observed had a different role in each situation: Fabien and Maurice participated in the design of the videos and have chosen them, Carole was not involved in the design of the videos and has not chosen them neither (she approved the selection), Lisa "reconstituted" verbally the content of a video; and she chose by herself the extract of a video to present. Yung et al. (2010) and others remind us of the importance of this step. It will be interesting to see how it actually influences the interactions and learning. It also questions, indirectly, the availability of various videos according to learning goals that can be formulated.

Either way, we can highlight the apparent quality of the pedagogical alignment (whose effectiveness remains to be verified) offered by all these trainers. They show a rich reflection and pedagogical intuitions that are well articulated, rich and varied.

These trainers appear to be reflexive, open to improvement and ready to face challenges. This is a very good augurs for the upcoming steps in the research that will be: 1- to analyze the evolution of online interactions across these courses and specifically across activities that use videos; 2- to suggest avenues of improvement for each course depending on the identified weaknesses; and 3- to repeat the entire approach to assess the desired evolution.

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