VIDEO LEARNING ENVIRONMENT FOR GUIDING STUDENT TEACHERS’ CONSTRUCTION OF ACTION-ORIENTED KNOWLEDGE

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Abstract

New methods for applying videos for learning are needed in teacher education. The videos are especially useful in student teachers’ construction of action-oriented knowledge. Explication of practice and formation of students’ action-oriented knowledge are more successful when they are guided through reflection. Videos help to situate learning, explicate tacit understandings, develop habits of reflection, improve self-awareness, integrate theoretical and practical understandings, and analyze details of student teachers’ own lessons. Therefore, a new innovative video learning environment was developed to allow student teachers and teacher educators to reflect, widen, share, and implement pedagogical practices and knowledge resources related to teaching, teacher learning, and supervision. This video learning environment enables student teachers to upload short videos about their critical incidents that characterize meaningful fragments of their classroom practices and interaction with pupils that are especially critical and thus useful for learning as teachers. These videos can be viewed by all users of the environment or by groups specified by the owner of the video. This video learning environment was tested by student teachers, their supervising teachers, and university lecturers according to the needs of using it for guided reflection in constructing action-oriented knowledge. The results of this study showed that the learning environment can be applied for student teachers’ training. It was especially important that all users found this learning environment easy to use and safe for presenting and analyzing ethically sensitive material. In addition, several recommendations were made to be considered in different video learning environments.

Keywords: videos, teacher education, action-oriented knowledge, practical knowledge, student teachers.

1 INTRODUCTION

Video training has become more accessible through the spread of mobile computing devices such as tablet computers and smartphones, which make video recording easy and simple. This calls for new methods of applying videos in learning. The potential of videos and case-based learning has been widely recognized in the context of teacher education. For example, the EBSCO Discovery Service academic search portal gives 1,271 references with full texts available where “video” and “teacher” have been used in the title of the publication (January 15, 2014). Videos have been used in the assessment of preservice teachers’ knowledge related to effective teaching [1], for creating portfolios of classroom practice [2], or just for presenting illustrative examples or anchors in the learning of educational theories [3]. Masats and Dooly [4] suggest rethinking the use of videos in teacher education. They argue that videos are too often used to develop one specific area of competence and that a more holistic approach for using videos broadly in teachers’ professional development is needed. Professional development, however, should be a lifelong process while new innovative methods for teaching and learning are introduced. Therefore, we should apply video recordings as a tool or method that can be reused in several contexts in both preservice teacher education and continuous professional development of teachers.
One of the potential areas were videos are especially useful is student teachers’ construction of practical knowledge [5] or action-oriented knowledge [6]. This has been described as know-how that is accumulated through experience and can be used in everyday teaching situations [5] or as a collection of strategies, rules, and principles that can be used in particular teaching situations [6]. In this paper, we refer to these as synonyms. Explication of practice and formation of students’ action-oriented knowledge become more successful when guided through reflection. Reflection is a process of learning from experiences through individual inquiry and collaboration with others [7–10]. In teacher education, reflection is often reported as a process of evaluation that teachers or student teachers should engage in regularly to interpret and improve their professional practices [11]. Owing that reflection can be challenging for student teachers, the role of guidance by mentoring teachers is often highlighted [see 11–13]. Through reflecting, teachers are guided to systematically describe, justify, critique, and discuss different technical, practical, or sensitizing aspects of their teaching experience [14]. A more specific guided reflection procedure contains stages where students have to analyze their experiences by themselves and later with their peers or mentor teachers [15].

Reflection can be effectively supported by the use of videos that help to situate learning [16–17], explicate tacit understandings [18], develop habits of reflection [19], improve self-awareness [20], integrate theoretical and practical understandings [21], and analyze details of student teachers’ own lessons [22]. Video data give a more distanced viewpoint, construction of shared understandings, and possibilities for detailed representations of actions. In analyzing a video, teachers and student teachers can watch themselves from a side that makes it possible to see something that cannot be detected without this “mirror.” In addition, the person in the video can ask detailed feedback from many other persons to learn from their analysis. Finally, videos can be slowed down, stopped, and rewound to focus systematically on specific details [for further information, see 23 and 24].

Despite the described advantages of using video recordings in preservice teacher education and teachers’ lifelong learning, there are still some tensions in using this method widely. Our previous studies indicate that both experienced teachers and novice student teachers themselves do not feel comfortable when their lessons are videotaped. However, they agree that this method is very useful for their professional development [25]. Kleinknecht and Schneider [26] have concluded that the analysis of teachers’ own videos requires more prearrangement and scaffolding compared with the analysis of videos about other persons. Thus, to learn effectively from one’s own videos through reflection, a supportive community and/or technological tool is needed.

The goal of our study was to develop a video learning environment that is a technological tool for supporting student teachers’ guided reflection procedure where their peers and mentor teachers can contribute. Therefore, we conducted a needs analysis, developed the first version of the learning environment, and applied it in a session where student teachers, mentor teachers from a training school, and teacher educators from university all were involved in their roles and where all advantages and disadvantages of using the learning environment were discussed in a group.

2 METHODS

In order to develop the video learning environment, a needs analysis was conducted in the project team of an international project for action-oriented teacher education. This team consisted of university staff from Estonia, Finland, Spain, and the Netherlands and covered a wide variety of experiences in using videos and guided reflection procedure in teacher education. It was specified that this video learning environment should allow student teachers and teacher educators (including supervisors in schools and universities) to reflect, widen, share, and implement pedagogical practices and knowledge resources related to teaching, teacher learning, and supervision. The following activities were foreseen by the team:

- Uploading videos to the video library of the learning environment
- Associating metadata, including tags formulated by the users, with each video (country of origin; language; type of video: teaching activity / peer dialogue; subject; age level: preschool, primary, secondary, university; type of the episode [optional]: exemplary, challenging)
- Searching: based on the specific tags and structured metadata
- Viewing: play, stop, pause
- Associating different files with the video (in the library as one set): these files will be displayed in three categories in tabs next to the video player; these can be uploaded and associated by the one who uploaded a particular video or by researchers
- Defining tasks—text that will appear either directly on the page (short assignments) or can be added as downloadable files
- Writing comments—by the student teacher (e.g., about the conditions of the episode—if it was the first or last lesson of the day, why this episode was selected, etc.), supervisors, or researchers (in formats of text, video, and audio)
- Adding transcriptions of the video or texts of theory related to the video-text files
- Adding subtitles in different languages and translating these based on a specific language

In addition, there were several specified technical aspects and security expectations because videos of student teachers might contain information that is not public.

Based on these specifications, a first prototype of the video learning environment was developed, and through several tests by the project team, it was improved until it was ready for testing with end users.

The end users applied the video learning environment according to a specific scenario that consisted of three parts: (i) introduction of the guided reflection procedure supported by the video library, (ii) video learning environment testing, and (iii) discussion on additional opportunities for using the video library. The aim of the first part was to increase awareness of the procedure that should be supported by the video learning environment. This is not in the focus of the current study, and no data were collected about this. In the second part, each participant in the study was assigned his/her role in the process. Students started their work by creating a user account. Then a university lecturer created a group for the students to test the possibility to assign students into different groups that do not see the others’ videos. Next, the students uploaded a video and added all metadata to this. Now the university lecturer uploaded an instruction for students’ task of oral reflection, and after that, the students uploaded their oral reflections to the learning environment. Finally, the same was done with written reflections. In each of these stages, a feedback questionnaire was filled out by all participants. They had to evaluate three aspects: (i) how easy it was to technically use the learning environment, (ii) how user-friendly it was, and (iii) was it clear what kind of information was needed. In addition, they were asked to comment positive aspects and issues. Each of these aspects was evaluated on a five-point scale of agreement/disagreement.

The session was conducted in a group of two student teachers, two mentor teachers, and three university lecturers. Their answers were analyzed qualitatively.

3 VIDEO LEARNING ENVIRONMENT

The video learning environment developed in the current study (http://acttea.ut.ee/video/) enables student teachers to upload short videos of critical incidents that characterize their classroom practice and interaction with pupils. Being critical, these incidents are of a special value for teacher learning. However, these also have to be safely stored so that only the persons with specific rights have access to the videos. Thus, the video learning environment was developed so that the videos can be viewed by all users of the environment or by groups specified by the owner of the video or administrators of the environment. In addition, all videos can be accompanied by tasks, comments, and materials such as video transcriptions, theoretical texts, and expert commentaries (see Fig. 1). All users of the learning environment are free to form groups of users where they can add or remove members in order to keep privacy intact. Finally, the learning environment has been developed for international use. Subtitles in different languages can be added via an integrated translation tool and make the environment easy to use in multilingual collaborative study groups.
The application was developed on 5D Basement platform based on open-source software (PHP and MySQL). Developing a special application according to the particular needs of the project was a reasonable solution, considering the high cost of a commercial video library and server software. Using open-source software enables to avoid licensing fees and instead concentrate on the development of the application. jQuery and its plug-ins were used for creating an interactive user environment. For optimizing server load, it was decided not to store uploaded videos locally but to use a service provider. Regarding configurability and security, the Vimeo Plus service was chosen. It enables to display videos stored under a special account only at the project’s video learning environment portal, thus satisfying the security needs of private data. Communication between the portal and Vimeo is arranged through API that enables both uploading videos and accessing them via an embedded player supplied by Vimeo.

In addition to the common user environment that is accessible to all registered users of the portal, a special administrative back end was programmed. It also enables to manage videos, users, keywords, and translations of user interface texts. Because the video learning environment was meant for international use in a multilingual environment, special tools were designed and implemented. First, metadata, used for describing videos by users, can be translated via the administrative environment. It enables to use keyword-based native language filtering and searching in different languages, returning results independent of original language, used for initial entering of metadata. Second, subtitles in multiple languages can be used and switched during video playback; moreover, translating subtitles is available via a convenient portal interface.

4 USER FEEDBACK ON THE VIDEO LEARNING ENVIRONMENT

This video learning environment was tested by student teachers, their supervising teachers, and university lecturers for video-guided construction of action-oriented knowledge. Seven stages were distinguished in their testing scenario. All these were evaluated in three aspects by student teachers, supervising mentor teachers, and university lecturers. In general, the opinions of these three groups did not differ (average score on a five-point scale, 3.6 or 3.7). The highest average score was in the case of technical use (3.9) and the lowest in user-friendliness (3.5).

4.1 Technical use

Most of the users agreed that it is technically easy to use the video learning environment. It was very easy to create a user account—most of the users completely agreed with this. Most of the people also agreed that it is easy to create a group of students or to upload videos or other documents. A little bit more difficult seemed to be to upload an instruction of tasks for the students or oral reflection, where at least three out of seven persons neither agreed nor disagreed that it was easy.
It was the concern that uploading videos takes too much time. We understand that it might be an issue when working with video files in the Internet, but it seems that the users at least need information about the progress of this process, and that should be provided by the environment.

4.2 User-friendliness

Similar issues as with technical use were also detected in the case of user-friendliness—users neither agreed nor disagreed that uploading of documents is user-friendly. However, this opinion was, in this aspect, also valid in the case of uploading videos or other documents.

The users liked if there was no unnecessary information. However, they disliked that some information are “hidden” behind icons. It was not very intuitive to look for both groups and data about the user through an icon of a person. They expected that some textual information is also available. The same is with confirmation messages—the users expected that they are always informed if their activity was successful. In addition, they found that sometimes font size should be increased in order to improve readability. Some users found that drop-down menus present only limited information and that scrolling is not reasonable if there is more place for a longer menu. It was also found that it is not reasonable to delete several user groups that should not see a video or task. It would be much more user-friendly if the user can select one or several groups to whom a video or task should be made visible.

To increase user-friendliness by decreasing their workload, it was suggested to prefill some information (date, language, country) by default information depending on the user’s characteristics and data available in the computer or the Internet.

4.3 Clarity of information needed

Expected information was clear only in three of seven stages. In other cases, it was neither clear nor unclear. The issues were again detected in uploading videos and different materials except other additional documents.

The users indicated that some categories in the predefined system of metadata were not clear. It was not intuitively understood what is meant by video type or age-group. In the case of selecting user groups who will get a particular task, it was not always clear why these groups are needed at all.

4.4 Recommendations

In general, these findings indicate several important expectations of the end users in using a video learning environment for supporting guided reflection to develop action-oriented learning of student teachers. These ideas can be formulated as suggestions to other instructional designers who develop video-based teacher education. We would like to recommend considering the following aspects:

- Present only information that is by minimum needed by the users.
- Icons should be accompanied with textual information to increase user-friendliness.
- Users expect feedback on every activity to be sure that they were successful.
- Texts of the learning environment should not be too small.
- Progress bar is needed in cases of processes that take longer time.
- Prefill as much information as possible to decrease the workload of users.
- In case of unusual elements of metadata, a short description should be available.
- To have a better overview of information, drop-down menus should be as long as possible.
- Both selecting and unselecting options should be available for users to apply the procedure that takes them less effort.

5 CONCLUSION

In conclusion, the aim of our study was fulfilled—a video learning environment that is applicable for supporting student teachers’ action-oriented knowledge was developed. This video learning environment was applied by a group of students, teachers, and university lecturers who found generally that the learning environment can be applied for student teachers’ training. It was especially important that all users found this learning environment easy to use and safe for presenting and
analyzing ethically sensitive material. However, in addition, the study revealed several users’ expectations that can be used in fine-tuning our video learning environment, but these can also be considered by other instructional designers who develop similar tools or have to select them for use in their research projects or teacher education. The main limitation of this study is that the data were collected “in labor”—the users tested the learning environment in one group under the guidance of a person who supported the users if needed. Additional tests are needed in action. In addition, it would be interesting to study how this learning environment can be applied in different languages and countries.

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