

Case-Based Learning in Initial Teacher Education: Assessing the Benefits and Challenges of Working with Student Videos and Other Teachers' Videos¹

Kathrin Krammer, Isabelle Hugener,
Manuela Frommelt,
Gabriela Furrer Auf der Maur,
Sandro Biaggi

University of Teacher Education Lucerne, Switzerland

Abstract: The ability to analyze classroom situations proficiently is regarded as one of the key prerequisites for successful teaching. Although a steadily increasing body of empirical evidence proves that case-based learning with videos can foster professional vision in teachers, it is still necessary to gain a better understanding as to what type of video (one's own or those of other teachers) is especially impactful in initial teacher education. Against this background, we conducted the intervention study VideA ("Video Analysis in Teacher Education") in the first year of a Swiss teacher preparation program, whose chief aim consisted in promoting pre-service teachers' professional vision. Concretely speaking, we compared the students' ($N = 159$) and their facilitators' ($N = 26$) assessments of case-based learning with their own and other teachers' videos in terms of self-reported acceptance and effectiveness. Three seminar groups of about 18 second-semester students analyzed videos of their own teaching (Intervention A; $n = 56$), while three other seminar groups of about the same size analyzed videos of other teachers unknown to them (Intervention B; $n = 51$). The analyses were moderated by facilitators and supported with supplementary materials originating from the videotaped lessons. Acting as a control group, students in a further three seminar groups solely analyzed written teaching and learning materials, and did not make use of videos altogether ($n = 52$). The results show that the students' as well as the facilitators' ratings are quite high, irrespective of the examples of actual teaching practice used. Yet a comparison of the two video settings revealed that learning with one's own videos received a higher degree of acceptance from both the students and the facilitators than working with other teachers' videos. The same applies to effectiveness, which got slightly higher ratings in Intervention A than in Intervention B.

Keywords: teacher education, professional vision, case-based learning, lesson analysis, different types of classroom videos

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A steadily increasing body of research demonstrates that classroom videos can be a powerful tool in teacher education (e.g. Blomberg et al., 2013; Goeze et al., 2014; Janik & Seidel, 2009; Santagata, 2014; Seidel, Blomberg, & Renkl, 2013; Sherin & van Es, 2009). However, despite their considerable media-specific potentials, many questions are still open, so that there is a persistent need for further substantiated knowledge about the effects and conditions of learning with videos. As a case in point, the question as to how professional competences of teachers develop as a function of video-based reflection on their own versus others' teaching is still largely unanswered (Seidel et al., 2011; Zhang et al., 2011), and even completely uninvestigated in the field of *initial* teacher education. Here the intervention project VideA (*Video Analysis in Teacher Education*) comes in, whose aim consists in promoting pre-service teachers' professional vision with respect to three selected basic features of effective teaching, and in gaining new insights into the effects and processes of learning with videos. After the completion of the intervention, the participating pre-service teachers and their facilitators assessed their experiences with videos in terms of acceptance and effectiveness (Krammer & Hugener, 2014). In what follows, we expound the theoretical background of case-based learning with different types of video, present our intervention study in detail and report selected results. After the interpretation of our findings we conclude by highlighting specific benefits and challenges of learning with student videos and other teachers' videos in initial teacher education.

1 Learning with videos in teacher education

The ability to analyze classroom situations in a proficient way is generally regarded as a key prerequisite for successful teaching (Sherin, Jacobs, & Philipp, 2011). It comprises competence in noticing and interpreting classroom situations, and is referred to as "professional vision" (Seidel & Stürmer, 2014; Sherin & van Es, 2005). Professional vision requires conceptual knowledge about the conditions of effective teaching as well as the ability to apply this knowledge in actual practice (Stürmer, Könings, & Seidel, 2013). Recent research findings, which provide evidence for a correlation between professional vision and successful teaching, clearly underpin the importance of this specific ability (Kersting et al., 2012; Sherin & van Es, 2009). Thus, as approaches that make use of case-based learning with videos have already proved to foster professional vision (Santagata & Guarino, 2011; Stürmer et al., 2013), they can also be assumed to offer a promising way of establishing the essential link between theory and practice (Blomberg et al., 2013; Brophy, 2004). Although most projects conducted on learning with videos were embedded in professional development programs (e.g. Borko et al., 2008; Krammer et al., 2006; Sherin & van Es, 2009), there are also encouraging findings for initial teacher education, which point to the potential of promoting the professional vision even in pre-service teachers (e.g. Goeze et al., 2014; Gold, Förster, & Holodynski, 2013; Santagata & Guarino, 2011; Seidel et al., 2013; Star & Strickland, 2008; Stürmer et al., 2013).

Up to now, though, only a few research projects have pursued the question of how professional competences of teachers develop alongside video-based reflection on their own versus other teachers' teaching, and there are even no findings at all on this specific issue as far as initial teacher education is concerned. However, currently available results from studies with practicing teachers indicate that they deem their own classroom videos more authentic and motivating than videos of other teachers, which, by contrast, tend to be commented on in a more elaborated and detailed, but also more critical way (Kleinknecht & Schneider, 2013; Seidel et al., 2011; Zhang et al., 2011). Whereas videos of one's own teaching support reflection and discussion on personal experiences, other teachers' videos provide the opportunity to focus attention systematically on observing and interpreting the realization of particular basic features of effective teaching (Baecher et al., 2013).

1.1 Focal points of working with one's own videos

In many professional development projects which work with classroom videos, the activities are based on sequences that document the participants' own teaching. Such recordings usually prepare the ground for guided reflection and discussion on one's own experiences, in which reference to personal questions on instructional issues constitutes a valuable basis for the feedback of colleagues on one's individual teaching behavior (Baecher et al., 2013; Krammer, 2014; Krammer, Hugener, & Biaggi, 2012). In comparison with videos of unknown classrooms it seems that analyzing one's own teaching increases the extent of emotional involvement, and allows the participants to relate themselves to the situation more vividly (Borko et al., 2008; Kleinknecht & Schneider, 2013). At the same time, however, working with one's own videos can evoke negative emotions that affect self-esteem, especially in relatively young and inexperienced teachers (Kleinknecht & Poschinski, 2014).

Against this general background the question arises whether this specific form of learning can already be productively implemented in initial teacher education. For though its potential for initiating active involvement proves to be quite high, there is also the danger that repeated observation and discussion of sequences that are taught by novices provides too little stimulus for the development of professional competences, and thus might further the adoption of suboptimal teaching behaviors. The paramount aim of working with students' own classroom videos should therefore consist in a theoretically substantiated reflection on the effects of their individual teaching behavior on pupil learning, and in developing alternative pedagogical strategies on the basis of conceptual knowledge about effective teaching.

1.2 Focal points of working with other teachers' videos

Working with other teachers' videos makes it possible to illustrate and analyze realizations of particular teaching behaviors, which novices are usually not able to perform themselves yet (Biaggi, Krammer, & Hugener, 2013). Among others, videos

122 of unknown teachers offer the opportunity to make the students' observations more sensitive to selected relevant features of classroom teaching (Borko et al., 2011). As recent findings indicate, it seems likely that the analysis of other teachers' videos provides more stimulus for developing new perspectives on classroom teaching and for coming up with alternative interpretations than dealing with one's own videos (Kleinknecht & Schneider, 2013; Seidel et al., 2011). Nevertheless, also this way of working with videos inevitably arouses positive as well as negative emotions (Kleinknecht & Poschinski, 2014), which needs to be taken into account.

When following this approach, facilitators are in the position to direct the course of the discussions more tightly, and to promote the further development of the students' teaching behavior in a systematical way. At the same time, the facilitators should make sure that the students do not prejudge the teaching sequences under consideration, and that they do not adopt certain ways of acting without reflection. Therefore, the main purpose of working with videos of other teachers is once again to reflect on potential effects of teaching actions, and to suggest viable alternative strategies to enhance pupil learning, both based on profound conceptual knowledge about effective teaching.

2 Method

2.1 Aim of the study

The overall aim of the intervention study to be presented below was to increase the understanding of how case-based learning with different examples of actual teaching practice supports pre-service teachers' professional vision. As a prime research interest we investigated the use of videos recording the students' own teaching in comparison with other teachers' videos. The intervention was specifically designed to foster pre-service teachers' professional vision with respect to three basic features of effective classroom teaching which are deemed relevant to pupil learning irrespective of subject and grade (Helmke, 2009; Stürmer et al., 2013): the first feature *goal clarity* includes transparency about goals and requirements as well as a clear lesson structure, while the second feature *teacher support* refers to process-oriented support of learning processes that is based on open questions, scaffolds and adaptive feedback, thus encouraging reflection. The third feature consists in the creation of a *positive learning climate*, to which aspects like humor and appreciation are essential.

The analyses pertaining to the effects of the intervention on the development of the students' professional vision are at the center of currently ongoing research. So in this paper, we pursue the questions as to whether the facilitators assess the elements of the intervention as useful, and as to whether both the facilitators and the students accept case-based learning with examples of actual teaching practice and regard it as an effective means of learning. Making reference to expectan-

cy-value models it is reasonable to suppose that facilitators as well as students are willing to engage actively in video-aided seminars when they expect the method to be goal-directed, and consider the learning opportunity to be supportive (Lipowsky, 2011). Thus, the facilitators' positive perception of the usefulness of the elements of the intervention, and positive acceptance and effectiveness ratings of both facilitators and students are a crucial precondition for creating and using video-based learning environments to foster professional vision, and ultimately for a permanent implementation of videos in teacher preparation programs.

Taking these general considerations into account, we focus the remainder of our paper primarily on the following elementary research questions:

1. Do the facilitators assess the elements of the intervention as being useful?
2. Does case-based learning with examples of actual teaching practice meet with the acceptance of the participating students and facilitators?
3. Do students and facilitators assess case-based learning with examples of actual teaching practice as being effective?

2.2 Sample

The study VideA was conducted in the first year of a teacher preparation program for pre-primary, primary or secondary level teaching at the University of Teacher Education Lucerne, Switzerland. Nine seminar groups participated in the project and were each attended to by a team of facilitators.

Students

The sample of the intervention consisted of a total of 163 students. On average, they were 21.74 ($SD = 2.01$) years old; 127 (77.9%) of them were female and 36 (22.1%) male. The students' participation in the intervention was mandatory, but they were randomly assigned to one of the three settings of case-based learning (Intervention A: student videos; Intervention B: other teachers' videos; Control Group: written teaching materials, see *Structure of the intervention workshops*). Nonetheless, the two intervention groups and the control group are comparable with respect to age, sex and the school level they were being prepared for. As four students did not complete the questionnaire (see 2.4), our findings are based on 159 valid cases.

The evaluation of a scale from Drechsel (2001), which assesses interest in the topic of teaching and learning on a range between 1 (very low) and 6 (very high), showed that the students in our sample entered the first semester of their teacher preparation program with a high level of interest in teaching and learning ($M = 4.32$, $SD = 0.64$), and that the three intervention settings did not differ in this respect ($F = 1.21$, $df = 2$, $p > 0.05$). Moreover, there is no significant correlation between the students' interest in the topic of teaching and learning and their acceptance and effectiveness ratings to be reported in the results section below.

124 Facilitators

The weekly intervention workshops were run by a total of 17 (65.4%) female and nine (34.6%) male facilitators. All of them were certified teachers who held a diploma in teaching, with their average practical teaching experience amounting to 12.96 years ($SD = 6.47$). 18 facilitators were current teachers and supervising teachers with an additional qualification in adult education. The other nine facilitators were in possession of a university degree in educational science or psychology, and at the same time lecturers at the University of Teacher Education Lucerne.

All of the nine participating seminar groups with approximately 18 students were attended to by a team of three facilitators: two supervising teachers and one graduate lecturer. Each team participated voluntarily and was randomly assigned to one of the three intervention settings. In consequence, nine facilitators based their workshops on student videos, and eight dealt with other teachers' videos, while the nine control group facilitators made use of written teaching and learning materials. Whereas the facilitators in charge of the video intervention groups did not differ with respect to their overall experience in teaching at the University of Teacher Education (student videos: $M = 3.39$, $SD = 3.18$, $n = 9$; other teachers' videos: $M = 2.81$, $SD = 1.81$, $n = 8$), there was a difference ($U = 15.5$, $p < 0.05$) between the facilitators working with other teachers' videos and the ones working with written teaching and learning materials, since the latter had more experience on average (written materials: $M = 6.00$, $SD = 3.16$, $n = 9$).

In a three-day session, a total of 27 facilitators were trained on the content and the structure of the intervention, and on the Lesson Analysis Framework (see *Procedure of the video analysis*). Thereafter, they were ready for their workshops with the students. One facilitator did not complete the questionnaire (see 2.4) for health reasons, so that all in all there are 26 valid cases available for the purpose of evaluation.

2.3 Description of the intervention

In first year of the full time preparation program, all students follow the same curriculum, which mainly covers educational psychology, general pedagogy and subject-specific pedagogy (dealing with subjects like mathematics, languages, biology, and history). The intervention was implemented as part of a mandatory course in the second semester that dealt with general teaching skills and techniques. In the following subsections, we describe the structure of the intervention workshops, the selection of videos and supplementary materials, the procedure of the video analysis, and finally the training of the facilitators

Structure of the intervention workshops

The theoretical background of the three basic features of effective classroom teaching (goal clarity, teacher support, and positive learning climate) mentioned in section 2.1 was introduced right in the first week of the second semester. All

participating students received study notes with a description of the features to be focused on and examples of how to put them into practice. These conceptual inputs prepared the ground for the subsequent analyses of concrete realizations in examples of actual teaching practice, which took 90 minutes every week (Table 1). These weekly analyses were conducted in a total of nine groups which had been assigned to one of three specific intervention settings by lot. Three groups of about 18 students worked with *videos of their own teaching* ($n = 57$ students) which had been recorded during their teaching practice, while three other groups worked with *videos of other teachers* (unknown to them), which had been preselected by the facilitators ($n = 53$ students). By contrast, three groups did not work with videos at all, but made use of *written teaching and learning materials*, yet dealing with the same issues ($n = 53$ students). The workshops were usually organized in a half-group setting (about nine students) and each run under the responsibility of one facilitator.

Table 1 Workshop structure in the three intervention settings (one workshop per week; LAF = Lesson Analysis Framework)

Step	Duration	Intervention A	Intervention B	Control Group
1	90'	Analysis of the students' own videos with LAF $n = 57$	Analysis of other teachers' videos with LAF $n = 53$	Analysis of written teaching and learning materials with LAF $n = 53$
2	20'	Consolidation: learning journal entries		
3	30'	Transfer: lesson planning		

After each 90-minute analysis the students documented their main insights in a learning journal² for about 20 minutes, derived inputs for their own teaching practice, and substantiated them by referring to their theoretical knowledge about effective teaching. This way, the learning journal entries served the purpose of consolidating the newly gained insights. In the last 30 minutes of the workshop, the students finally had to plan their next teaching practice, which enabled them to apply their fresh knowledge immediately to a realistic and personally relevant scenario. In accordance with Step 1 of the Lesson Analysis Framework (LAF, see *Procedure of the video analysis*), they first analyzed contents, learning goals and potential barriers to comprehension, and then moved on to concrete planning activities in preparation for their forthcoming lessons.

Selection of student videos and supplementary materials

In groups who worked with *videos of their own teaching*, the facilitators supported the students in the process of video selection. To prepare the facilitators for this

² These learning journal entries are presently being analyzed in Sandro Biaggi's PhD-project (Biaggi, Kramer, & Hugener, 2014), whose findings will be published later on.

126 specific kind of assistance, the research team provided a careful introduction and supplied them with the assignments which had been created to guide the students in editing a couple of sequences from their own classroom. The students were filmed by the facilitators or fellow students in the course of their teaching practice. Thereafter they were to select one or more sequences from these lesson recordings. Altogether, the sequences had to last between 6 and 12 minutes and were supposed to pertain to one of the three basic features of effective teaching (goal clarity, teacher support or positive learning climate). The video sequences could optionally be taken from the subjects mathematics, natural sciences, geography, history or languages (German, English, French). When deciding on the sequences, the students made sure that the classroom dialogues were clearly audible and visible. Moreover, they were asked to gather supplementary materials (e.g. lesson plans in which the selected sequences were marked, assignments, contents covered in the lesson, work outcomes of the pupils), which were intended to support the reconstruction and the understanding of the recorded teaching and learning processes during the analysis.

Selection of other teachers' videos and supplementary materials

For the groups who were supposed to analyze *other teachers' videos*, the research team had compiled suitable sequences from already existing classroom videos with supplementary materials in advance. Again, the selected classroom videos originated from the subjects mathematics, natural sciences, geography, history or languages (German, English, French). The main criterion for the selection was that the videos were well-suited for the purpose of analyzing classroom teaching with respect to the three basic features of effective teaching (goal clarity, teacher support or positive learning climate). It is important to note that the videos were not intended to act as particularly excellent examples. Rather, they had to contain the realization of at least one of the three focused features in a clearly observable fashion. Hence, all of the selected sequences allowed the students not only to notice certain indicators, e.g. of goal clarity, but also to develop and put forward suggestions for, say, enhancing the transparency of the goals to be achieved in class. For each workshop the facilitators chose one of the preselected videos of which they showed sequences of approximately 6 to 12 minutes in length to their group. Together with the videos, the facilitators provided supplementary materials which made it easier to embed the selected sequences in the course of the lesson as a whole, to identify its objectives, to reconstruct classroom interactions, and eventually to make sense of the pupils' work outcomes. In their entirety, these additional media prepared the ground for a profound discussion about the teaching situations with respect to their effects on the pupils' learning processes.

Procedure of the video analysis: LAF

As attentively guided joint discussions are crucial for successful case-based learning with videos (Borko et al., 2008; van Es et al., 2014), the facilitators moderated the group analysis along the lines of the *Lesson Analysis Framework* (LAF; Santagata & Guarino, 2011). The LAF directs the focus of attention on the pupils' learning and understanding processes, and encourages the students to substantiate their feedbacks by explicitly linking them to theory (Biaggi et al., 2013). In more detail, the framework consists of four analytical steps:

Step 1: So as to prepare the ground for the discussion, the *contents* covered in the lesson, the *learning goals* and the *expectations* set for the pupils are identified and, if need be, clarified. By studying lesson plans and assignments, the students familiarize themselves with the overall situation and the tasks to be completed. This allows them to define the demands on the pupils and to anticipate potential barriers to understanding.

Step 2: The students observe and describe the *pupils' behavior* and formulate hypotheses about their current level of understanding. In addition to the videos, copies of the pupils' work (e.g. completed worksheets) or transcribed teacher-student interactions support the reconstruction of the learning and understanding processes, and thus form an integral part of the basis for this analytical step.

Step 3: The students focus on the *teacher's actions* and come up with hypotheses about their *effects on the pupils' learning processes*. While doing so, they are repeatedly asked to relate their comments and assessments concerning the realization of important aspects like goal orientation, learning assistance, and classroom atmosphere to concrete video observations. Moreover, they are expected to produce reasons for assumed connections between the teacher's actions and the pupils' learning by drawing on their conceptual knowledge about the basic features of effective teaching.

Step 4: The students *develop improvements in teaching* and alternative strategies with respect to the basic features of effective teaching for which they provide theoretically substantiated reasons.

Training of the facilitators

In preparation for their task, all of the participating facilitators received a three-day introduction to the theoretical background assumptions and the method of case-based learning with examples of actual teaching practice previous to the beginning of the intervention. The preparatory training sessions dealt with the following subgoals:

1. acquiring conceptual knowledge about the three basic features of effective teaching in focus (goal clarity, teacher support, and positive learning climate);
2. developing viable ways of realizing basic features of effective teaching, and analyzing them in concrete examples derived from practice (video recordings, teaching and learning materials);
3. being able to moderate the analysis of examples of actual teaching practice along the lines of the four steps of the LAF (Santagata & Guarino, 2011);

- 128 4. being capable of supporting the students in their lesson planning and learning journal activities with the aim of consolidating and transferring newly acquired knowledge.

This preparatory training was scheduled one month before the beginning of the intervention, with the last session taking place about one week in advance. Apart from that, the facilitators were twice visited by a member of the research team during the implementation of the intervention. The purpose of these visits was to give them follow-up training, and to advise them on the moderation of the joint analyses along the lines of the LAF. In order to check the implementation of the intervention, the facilitators were filmed in class.

2.4 Data collection

At the end of the intervention, both the students and the facilitators were asked to complete a questionnaire. The items and scales had been taken from Lipowsky et al. (2010), and adapted to evaluate acceptance and effectiveness of case-based learning with examples of actual teaching practice. Each participant was supposed to rate the questions on a four-point Likert scale, so that all of the responses could be scored at a range between 1 and 4 of the following format: 1 = Disagree; 2 = Somewhat disagree; 3 = Somewhat agree; 4 = Agree. In addition, the facilitators were given the opportunity to comment on their ratings in an open answer format.

As owing to the small sample ($N = 26$) it was not possible to identify scales in the facilitators' questionnaire, the respective results are presented as group values (M , SD) at the level of single items.

3 Results

3.1 Facilitator assessments of the elements of the intervention

Only the *facilitators* were asked to evaluate the items covering the single elements of the intervention and the study notes used to introduce the basic features of effective teaching. Their assessments turned out to be high in all three intervention settings (student videos, other teachers' videos, written teaching materials; see Table 2). All of them (video groups and control group) considered the basic features of effective classroom teaching in focus as relevant and, in particular, qualified the examples included in the study notes as helpful. In their opinion, case-based learning (with videos or written teaching materials) forms a suitable basis for analyzing and discussing the concrete realization of the three selected features, in which notably case-based learning *with videos* seems to attract the facilitators' interest. As far as this latter way of learning is concerned, other teachers' videos were deemed especially suited for discussing questions of how to arrange lessons, whereas the facilitators working with the students' own videos were particularly well able to be

responsive to and deal with their group's questions and interests. By contrast, the facilitators saw only little leeway for the overall conception of their workshops, because the contents and the procedure of the intervention had been predefined by the research team.

Table 2 Items evaluating different elements of the intervention: facilitator assessments

Items	Student videos	Other teachers' videos	Teaching materials
	(<i>n</i> = 9) <i>M</i> (<i>SD</i>)	(<i>n</i> = 8) <i>M</i> (<i>SD</i>)	(<i>n</i> = 9) <i>M</i> (<i>SD</i>)
The study notes on features of effective teaching cover relevant theoretical basics for first-year students.	4.00 (.00)	3.75 (.46)	4.00 (.00)
The study notes on features of effective teaching contain helpful examples for the practical realization of basic features of effective teaching.	3.75 (.46)	3.71 (.49)	3.67 (.50)
The examples of actual teaching practice (videos, written materials) provided a suitable basis for discussions on the basic features of effective teaching.	3.33 (.50)	3.50 (.53)	3.33 (.50)
I consider teaching with examples of actual teaching practice as interesting.	3.67 (.50)	3.75 (.46)	3.00 (.50)
The examples of actual teaching practice provided a suitable basis for reflections on questions addressing lesson arrangement.	3.00 (.50)	3.63 (.52)	3.13 (.35)
I was able to be responsive to and to deal with the students' questions and interests in a sufficient way.	3.38 (.74)	2.75 (.70)	2.44 (.73)
Case-based learning gave me enough leeway for designing the course stimulatingly and with a lot of variation.	2.33 (.50)	2.50 (1.06)	2.33 (.50)

3.2 Acceptance of case-based learning

Both the facilitators and the students were questioned about their acceptance of case-based learning with examples of actual teaching practice, which was done by means of seven items such as "The examples of actual teaching practice provided a suitable basis for discussions about teaching." In the student questionnaire, the internal consistency of this scale amounted to $\alpha = .79$.

The participating *students* reported a rather high degree of acceptance of learning with videos (Table 3), the comparison of the group means being significant ($F = 3.12$, $df = 2$, $p = .047$). Scheffé's post-hoc test reveals that acceptance as reported by students who had worked with their own videos was slightly higher than acceptance as reported by students who had worked with other teachers' videos. The effect is small to medium ($\eta^2 = .038$).

130 Table 3 Acceptance of case-based learning: student assessment scale

Scale	Student videos (<i>n</i> = 56) <i>M</i> (<i>SD</i>)	Other teachers' videos (<i>n</i> = 51) <i>M</i> (<i>SD</i>)	Teaching materials (<i>n</i> = 52) <i>M</i> (<i>SD</i>)
Acceptance of case-based learning with examples of actual teaching practice	3.08 (.50)	2.87 (.36)	2.97 (.43)

Student videos > other teachers' videos* ($p < .05$).

The *facilitators'* ratings of their acceptance of case-based learning are also quite high, but show no significant group differences (Table 4). In sum, the analysis of examples of actual teaching practice is regarded as providing a very suitable basis for fruitful discussions about teaching. Furthermore, our analyses indicate that the LAF is perceived as a useful means in this process.

Table 4 Items evaluating the acceptance of case-based learning: facilitator assessments

Item	Student videos (<i>n</i> = 9) <i>M</i> (<i>SD</i>)	Other teachers' videos (<i>n</i> = 8) <i>M</i> (<i>SD</i>)	Teaching materials (<i>n</i> = 9) <i>M</i> (<i>SD</i>)
The analysis of examples of actual teaching practice encouraged the students to reflect on their own teaching.	3.67 (.50)	3.13 (.35)	3.22 (.67)
The examples of actual teaching practice provided a suitable basis for discussions about teaching.	3.78 (.44)	3.75 (.46)	3.22 (.53)
The analysis of examples of actual teaching practice sharpened the students' view on teaching.	3.89 (.44)	3.00 (.00)	3.57 (.53)
The questions of the Lesson Analysis Framework (LAF) were helpful for scaffolding the analysis.	3.78 (.44)	3.50 (.53)	3.67 (.50)
Case-based learning was helpful for dealing with the course contents in depth.	3.13 (.83)	2.86 (.64)	2.86 (.64)

3.4 Effectiveness of case-based learning

Both the facilitators and the students were asked to assess the effectiveness of case-based learning with examples of actual teaching practice. In the case of the *students*, effectiveness was rated by means of a five-item scale with an internal consistency of $\alpha = .70$ and questions like "Our collaborative analysis of examples of actual teaching practice gave me new inputs for my own teaching." As our analyses show, the students reported a rather high degree of effectiveness (Table 5). The comparison of the group means was not significant.

Table 5 Effectiveness of case-based learning: student assessment scale

Scale	Student videos (<i>n</i> = 56) <i>M</i> (<i>SD</i>)	Other teachers' videos (<i>n</i> = 51) <i>M</i> (<i>SD</i>)	Teaching materials (<i>n</i> = 52) <i>M</i> (<i>SD</i>)
Effectiveness of case-based learning with examples of actual teaching practice	2.94 (.49)	2.84 (.48)	2.83 (.40)

On the whole, the *facilitators* rated the effectiveness of case-based learning with examples of teaching higher (*Table 6*) than the students did. Concretely speaking they got the impression that at the end of the intervention the students were better able to link conceptual aspects and teaching situations, to focus on the pupils' learning processes, and to provide knowledge-based reasons for the observed basic features of effective teaching than they had been before. In general, case-based learning with the students' own videos is considered to be particularly conducive to their individual competency development.

Table 6 Items evaluating the effectiveness of case-based learning: facilitator assessments

Items	Student videos (<i>n</i> = 9) <i>M</i> (<i>SD</i>)	Other teachers' videos (<i>n</i> = 8) <i>M</i> (<i>SD</i>)	Teaching materials (<i>n</i> = 9) <i>M</i> (<i>SD</i>)
Through the joint analysis of examples of actual teaching practice ...			
... the students' professional competency development was promoted.	3.78 (.44)	3.38 (.52)	3.33 (.50)
... the students were given new inputs for their own teaching.	3.00 (.70)	3.25 (.46)	2.67 (.71)
... the students became acquainted with other perspectives on teaching.	3.56 (.53)	3.25 (.46)	3.33 (.71)
... the students' teaching behavior changed.	3.33 (.67)	2.75 (.46)	3.11 (.78)
... the students learnt to be more strongly aware of the pupils' learning processes and learning paths.	3.56 (.73)	3.13 (.83)	3.56 (.53)
... the students learnt to better relate conceptual aspects and teaching situations (link between theory and practice).	3.11 (.33)	3.00 (.76)	3.33 (.70)
... the students learnt to provide theoretically substantiated reasons for their feedback on teaching (e.g. how an open question may support pupil learning).	3.33 (.71)	3.25 (.46)	3.11 (.60)

4 Interpretation

Based on the answers obtained from the student and facilitator questionnaires, we are able to present some first insights with respect to the potentials and challenges as well as the conditions under which learning with classroom videos in initial teacher education can be successful. In what follows, the quantitative findings are for illustrative purposes complemented by a selection of written comments which the facilitators made in addition to their ratings in the questionnaire.

To begin with, we can state that the facilitators of all three intervention settings thought the elements of the intervention (basic features of effective teaching, study notes, examples) to be useful. On the one hand, this assessment can retrospectively be regarded as having provided an advantageous basis for the successful implementation of the three intervention settings. On the other hand, knowing this is of value to the interpretation of the results, because it ensures that differences in the acceptance and effectiveness ratings are not due to and can thus not be explained by varying perceptions of the usefulness of the elements in the three intervention groups.

In general, the facilitators seem to consider teaching with videos more interesting than teaching with written teaching and learning materials, and their assessments of video-supported case-based learning in terms of acceptance and effectiveness tend to be higher than those of the students. Although learning with the students' own videos meets with the highest degree of acceptance, a comparison with learning with other teachers' videos reveals that the differences are not significant, and that the facilitators' written comments equally mention specific potentials as well as challenges of both types of video.

The assessments of the facilitators and the students who had worked with *their own videos* proved to be quite high and indicate that this way of learning is regarded as being particularly conducive to competency development. Furthermore, working with student videos is deemed especially helpful when it comes to deal with the questions and interests of the group, and, besides, seems to be highly motivating and stimulating. Accordingly, the facilitators perceived their students to be "keen to discuss with their fellow students, as well as open, frank and appreciative in their feedback." Another facilitator commented on the students' involvement as follows:

The students showed great interest in discussing examples of teaching, looked forward to watching their colleagues' videos, and were happy to receive feedback on their own videos. They appreciated that they got the opportunity to gain some insights into their colleagues' classrooms, and these mutual insights increased participation in discussions.

In accordance with these statements, findings from other studies corroborate that the participants' own videos are usually perceived as being very authentic and therefore stimulating (Kleinknecht & Schneider, 2013; Seidel et al., 2011; Zhang et al., 2011).

Despite their very positive overall assessment of working with student videos, the facilitators found it rather challenging to link the questions raised by individual

group members to the basic features of effective teaching. The connection between the three features under consideration and the videos had to be established beforehand, which resulted in increased preparation efforts. As the facilitators were not able to watch the video sequences prior to the workshop in every single case, it was occasionally quite demanding for them to guide the discussions in terms of content. Further challenges were located in a variety of issues, e.g. that the students had not always chosen suitable video sequences, that the sometimes poor sound quality of the videos made it difficult to understand the classroom dialogues, or that not all of the group members supplied sufficient supplementary materials, although these were supposed to make it easier to discuss the sequences also with respect to their effects on the pupils' learning processes.

Turning to learning with *other teachers' videos*, we can generally conclude that it was also appreciated, and thought of as promoting the development of teaching competencies in a similar vein. Owing to the greater inner distance to other teachers' classroom videos, the students attending this intervention group tended to be more critical in their discussions of the selected sequences, which corroborates recent findings about teachers' analyses of other teachers' videos (Kleinknecht & Schneider, 2013). Nonetheless, also in this setting premature or generalizing judgments about the teaching in the video could be counteracted by means of questions that tightly focused on the actually observed or assumed effects of the teachers' instructional behavior and through persistent requests for a rationale for proposed improvements. Furthermore, other teachers' videos proved to be especially suited for reflections on the organization of instructional processes, which allowed the students to get new inputs for their own practice. Exactly this very aspect, however, could be the reason why the students' competency development was rated slightly lower. A facilitator put it as follows:

All examples of actual teaching practice are good examples. So they provide the 'right way of doing it' from the very start, and give little scope for critically dealing with classroom reality which, every now and then, involves difficult situations too. Had the students been confronted with 'bad' examples of teaching, they would have had to think more actively themselves about the point of good teaching and about what is important to do, or also, about what the 'typical' mistakes really consist in. This would have required an occasional change of perspective, which would make much sense to me.

Moreover, this quote implicitly proves that videos of other teachers were perceived as positive examples, which was not the original intention of the research team. As for the preparation of the analyses, the facilitators who had worked with other teachers' videos appreciated the research team's precise instructions as to which course contents and basic features of effective teaching could be analyzed in the preselected videos.

In comparison with the video settings, case-based learning with *written examples of actual teaching practice* received about equally high student ratings in terms of acceptance and effectiveness. And again, the facilitators assessed the written tea-

134 ching materials as a useful means for considering different aspects of lesson planning and teaching. As in the intervention setting with other teachers' videos, they got the impression that they had not always been sufficiently able to attend to the students' interests and questions, which had apparently been easier in the groups who had worked with their own videos.

As regards the *Lesson Analysis Framework (LAF)*, the facilitators from all intervention groups found its guidelines for structuring the discussions very helpful, and the systematic procedure was thought to further constructive explorations of the teaching sequences under consideration. While moderating the joint analysis of the examples of actual teaching practice, the facilitators were careful to make sure that the process kept to the fixed order of the single analytical steps, and to prevent hasty judgments about the observed teaching-learning situations. Besides, they repeatedly had to remind the students to substantiate their comments in terms of their relevance to the pupils' learning and by making reference to theoretical considerations. Unless such rationales had explicitly been asked for, the students manifested only little drive to propose reasons themselves. From a more general point of view, one of the facilitators summarized the challenges of case-based learning as follows:

The students are strongly oriented towards learning a lot of practical techniques for teaching in the classroom, but they do not like it very much to question things and to analyze them, and they provide only very few theoretically substantiated reasons themselves. They deem it sufficient, so to speak, to hear that something works more or less well. The question of how pupils learn and think plays a comparatively minor role. Such attitudes are difficult to change.

Another facilitator got the following, somewhat more balanced impression: "Some of the students found the reasoning processes very tiring (and accordingly demotivating), whereas others stated that they had benefited quite a lot from them."

5 Conclusion

Assessments of case-based learning with examples of actual teaching practice obtained from pre-service teachers and their facilitators indicate that this method is appropriate already at the very beginning of the initial teacher education. As far as the comparison between the two types of video is concerned, our results show that especially working with one's own videos meets with a high degree of acceptance, and that its effectiveness tends to receive somewhat higher ratings than working with videos of other teachers. In sum, both video-supported ways of case-based learning are accepted and can be applied in an effective manner, particularly if the specific benefits and challenges of working with videos are clearly kept in mind.

Further analyses will have to establish whether also the students' professional vision – which was measured by means of the standardized video-based instrument *Observer* (Seidel & Stürmer, 2014) – has improved in the three different intervention

settings. As first findings indicate, the increase in the video groups is significantly higher than the increase in the control group with teaching and learning materials (Krammer et al., 2013).

Furthermore, our analyses confirm the assumption that questions (like those, presented in section *Procedure of the video analysis: LAF*), which direct the focus of attention to the pupils' learning processes, are essential to the development of professional competence (Borko et al., 2008; Santagata & Guarino, 2011; van Es et al., 2014). Supplementary materials (in particular work outcomes of the pupils) can perform an extra supportive function, because they render the effects of the teaching activities on the learning processes better observable.

As regards a permanent implementation of case-based learning with videos in teacher preparation programs, some of the participating facilitators argue for a combination of working with the students' own and working with other teachers' videos. For introductory purposes, most of them favor starting off with sequences from other teachers' classrooms, and thereafter turning to the students' own videos. Current findings indicate that this combination is an efficient method to improve professional vision in teacher education (Hellermann et al., 2015). As an indispensable precondition for successful and productive learning with videos the facilitators' open comments generally emphasize a careful introduction as well as mutual confidence building, which prepares the ground for appreciative discourse. Besides, also a well-considered selection of suitable video sequences together with supportive supplementary materials and adapted assignments are thought to be crucial. Another aspect which should equally be taken into account is that video-based reflection on teaching is quite time-consuming, if it is to go in depth. Yet it is not only the actual group work in class itself that is very demanding. As several comments explicitly note, the facilitators necessarily need to pre-analyze the selected video sequences for themselves and establish the links with the pertinent theoretical knowledge about effective teaching beforehand. Still, such careful and thorough preparation activities are considered indispensable, if the discussions with the students are to be fruitful and substantial.

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Kathrin Krammer

University of Teacher Education Lucerne
Pfistergasse 20, Postfach 7660, 6000 Lucerne 7, Switzerland
kathrin.krammer@phlu.ch

Isabelle Hugener

University of Teacher Education Lucerne
Museggstrasse 37, 6004 Lucerne
isabelle.hugener@phlu.ch

Manuela Frommelt

University of Teacher Education Lucerne
Töpferstrasse 10, 6004 Lucerne
manuela.frommelt@phlu.ch

Gabriela Furrer Auf der Maur

University of Teacher Education Lucerne
Museggstrasse 37, 6004 Lucerne
gabriela.furrer@phlu.ch

Sandro Biaggi

Zurich University of Teacher Education
Lagerstrasse 2, 8090 Zürich
sandro.biaggi@phzh.ch