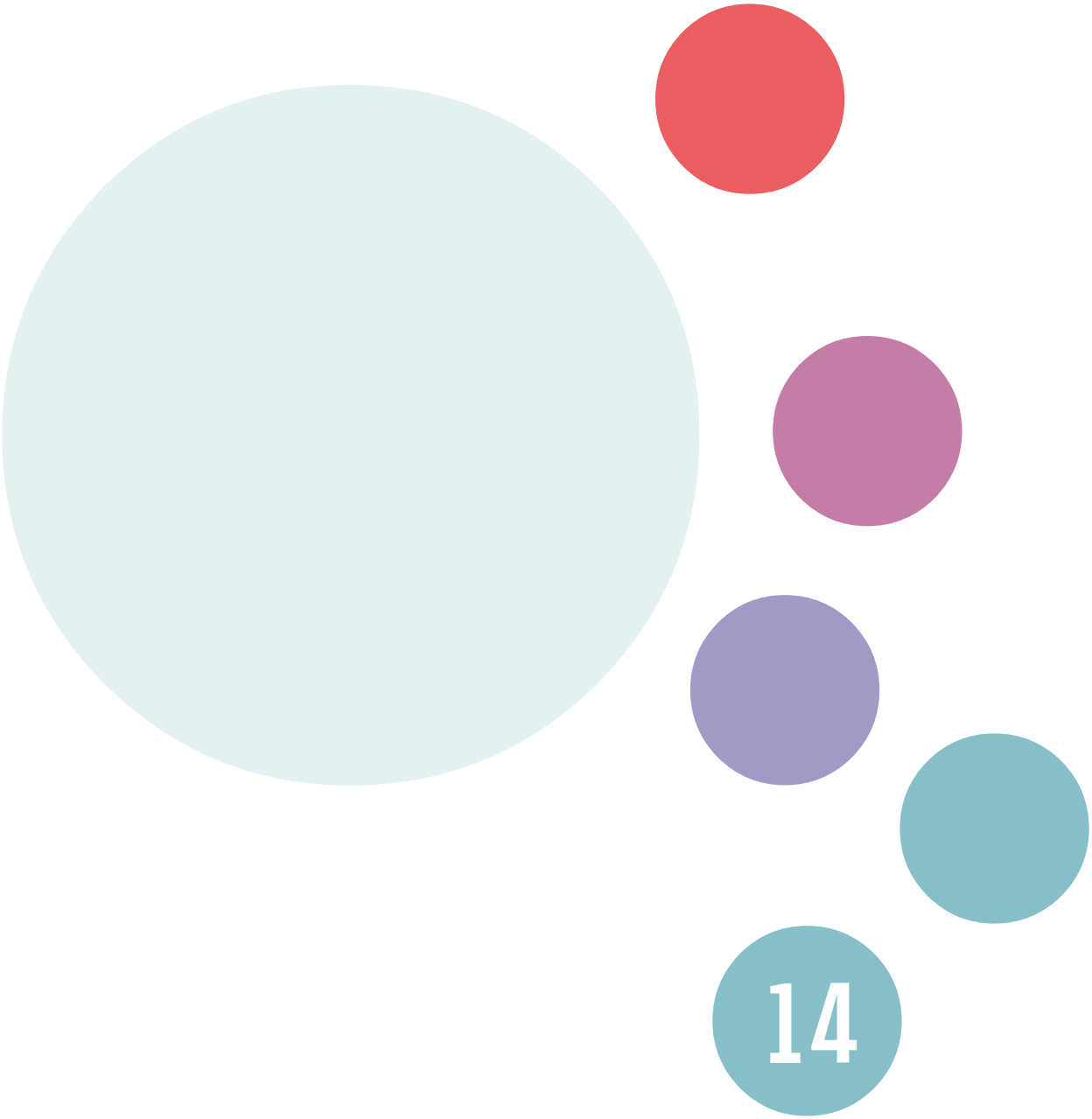
E-learning: Unlocking the Gate to Education around the Globe

14

14th conference reader

Centre for Higher Education Studies
Prague 2019



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Content

Dear Readers,

We are very pleased to present you with the proceedings of the 14th international conference *DisCo 2019: E-learning - Unlocking the Gate to Education around the Globe*, which was held June 20 - 21, 2019 in Prague, Czech Republic and organized by The Centre for Higher Education Studies and The University of West Bohemia. Enjoying the pleasant atmosphere of the conference venue in the seat of Microsoft Prague, over 100 participants from 17 countries took part in this event.

The conference opened with an interactive keynote speech by Tom Wambeke, Chief of Learning Innovation at the International Learning Centre of International Labour Organization, Torino, Italy. He presented a lecture called *A deep dive into the future: exploring e-learning scenarios using strategic foresight.*

On Thursday morning, participants also had a chance to learn how to distinguish real images and videos from the fake ones during the workshop led by Yulii Grek-Krylova. In the afternoon, the second keynote speaker Marco Spruit, an associate professor in the Information and Computing Sciences (ICS) department at the Faculty of Science of Utrecht University (UU) in The Netherlands, introduced how to use data in student instruction. He showed how to teach the basics of data science at university and how information science and other disciplines can work together. It showed a very useful symbiosis of three components: knowing what we are doing and aiming at, being able to name problems and data sources, and then using data analytics to gradually look for answers. The speaker also highlighted the necessity of asking the right questions. Nowadays, we are living in the data era and we do not have to collect it in many cases. There is a huge number of data already available but we need to know how to use it and mine it properly.

On Friday morning, participants could visit a workshop developed by Microsoft about *Artificial Intelligence in Education*. Further, the third keynote Maurizo Gentile, an Associate Professor of Teaching Methods and Special Education at LUMSA University of Rome and a Professor of Technologies for Learning at Sapienza University of Rome spoke about *Digital videos in teacher education: a professional vision model and four training strategies.*

A panel discussion on the topic *Future of Education* followed. Our keynote speakers and Anastasia Misseyani from The American College of Greece participated in the discussion. Attention was paid to issues of online education, the future of universities and the social competencies of teachers, and how it is possible to transfer them to the online environment. Again, it was an interesting shift for me where no one needs to discuss if "machines will

replace us", but the panellists thought carefully about where and how technology and global communities could help educators to engage in what really their specific domains of expertise are. I would like to emphasize that such a concept can significantly strengthen the credibility of the teaching profession.

We will need agility in education and a clear political vision/decision on what kind of education we strive for. The main trends in education are: an exponential speed of changes, a competence of learning how to learn and an internalization of HE.

The forthcoming trend will be a combination of humans and an artificial intelligence. We might expect a paradigm change in education based on a block-chain.

During the day, other interesting workshops from Microsoft were presented. Their topics were *Artificial Intelligence*, *Microsoft Notes* and *Forms & Minecraft.*

If we compare this conference with the previous years, we can observe two trends. The first one is the emphasis on competencies that appear as an emerging topic in didactics, online education, assessment, tutoring and an inverted classroom. Many contributions aimed at their development or evaluation.

The second point was to turn away from the LMSs, which seemed to interest almost no one anymore. Except for about one marginal mention, presenters paid no or very little attention to them. In general, the technical level played a leading role in specific educational situations which can be read as a signal that the EdTech community has gradually matured and that it can find its areas of interest outside specific technical applications or plugin analysis. This is also related to the shift in the average structure of papers which more strongly mentioned the support in the literature and worked with more demanding and ambitious methodologies rather than with unsophisticated questionnaires.

Now, I would like to point out several interesting papers from our collection. Michal Černý in his paper called *Digital Competence: from Self-evaluation to Analysis of Students Learning Behaviour* focuses on how students behave in the digital competence development courses.

Lucie Rohlíková et al. in their *All Pre-service Teachers Training in the Virtual Classroom: Pilot Study* presented how Virtual Reality could be used to develop teaching competencies of future teachers of geography.

Hana Tulinská in *Cross-Age Peer Tutors as Important Actors of University Online Courses –Information Literacy Course Case Study* shows what it means for a student to mentor younger classmates, what it feels like and how they reflect it.

Emilda Roseni's *Case of Albania: Measurement and Assessment as Main Components in the Curriculum of Foreign Languages* is an example of a topic that has appeared relatively strongly this year, namely in language education and possibly in international comparisons of different approaches and contexts. That is also a reason why after Maurizo Gentile's keynote speech, we are opening this book with a section on language teaching.

The closing section of the conference reader offers abstracts of contributions submitted in a form of a presentation.

Finally, we would like to express gratitude to our partners for their sponsorship and support. First of all, we thank The Central European Initiative, our general partner. We are also grateful to Microsoft for being our host and for delivering very interesting workhops to our international audience. Our thanks go to AAEI (Association of Adult Education Institutions) the Czech Republic, Navreme Boheme s.r.o, Prague Development Center, Veriod, Czech Association of Distance Teaching Univeristies (ČADUV) and media partner portals Open Education Europa and Edumenu; further, also to journals Andragogika v praxi, Aula, RicercAzione, Firemní vzdělávání and Ikaros. Last but not least, we really appreciate the enthusiasm and work of the Programme and Organizational Committees as well as our volunteers. Without their great effort and help, the organization of such an event would not be possible.

Jan Beseda, Centre for Higher Education Studies

Articles

Keynote speech

DIGITAL VIDEOS AND TEACHER EDUCATION: A RESEARCH-TRAINING FRAMEWORK		MAURIZIO GENTILE Department of Human Sciences LUMSA University of Rome

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Key words: Digital videos**,** Professional vision, Teacher Education, Training strategies, Assessment for learning.

Abstract: The article proposes a research-training framework about the use of videotaping in teacher education. It deepens two issues: a) the construct of *professional vision* and sub-processes that teacher activates during the observation of videos; b) the formative approaches designed to develop the teachers' competence to view a set of teaching actions. The *professional vision* is the process of noticing noteworthy events and making sense of them. In this context, it is interesting to investigate the relationship between general pedagogical knowledge and professional reasoning. Four training strategies activate del professional vision process during the use of digital video in teacher education. The first strategy addresses to stimulate the interpretation of teaching events without a preliminary and formal knowledge of pedagogy underlying the observed teaching action (*example-rule strategy*). The researchers recommend its use for in-service teacher training. A second way addresses both the knowledge of educational principles and the development of decision-making abilities (*rule-example strategy*). The authors suggest its use in pre-service teacher education. A third strategy is called "video club". It consists of a group of teachers who meet to watch and discuss excerpts of videotapes of their instruction. The last approach consists in one 20-hour course organized in three phases: 1) three workshops, 2) the videotaping of teaching actions performed in the classrooms, 3) the shared analysis of videos. This training strategy was developed in the context of research-project focused on understanding and practicing the *assessment for learning* approach. The aims of the project were: a) to design one in-service teacher education course based on digital videos; b) to study the interpretative frames that teachers activate when watching videos; c) to promote the *assessment for learning* approach.

Introduction

A high-quality of teacher education is critical to be effective in today's classrooms (INDIRE 2016). This topic is the heart of the European strategy to improve the quality of teaching (European Commission/EACEA/Eurydice 2015). In international surveys (OECD 2014) and public opinions (Economist,2016; Repley 2010; Leslie 2015) it is affirmed that several factors might influence students' learning. On all it merges the quality of teaching. But, how do we learn about the teaching competence? The most recent orientations highlight the transition from an innate approach ("good teachers are born") to a constructivist approach ("good teachers are made"). The latter is based on the following elements: a) the cycle "experience/reflection/improvement"; b) the mastery of pedagogical and content knowledge; c) the realization of collaborative action-research among peers; d) teachers' educational leadership.

In the in-service teacher education, it observes a change of paradigm: from a professional development view (Joyce and Showers 1980) to a professional learning perspective (Lieberman 1995). The former is based on the following principle: teachers' professional development mostly depends on the elements that feature the in-service teacher training (Showers, Joyce and Bennet 1987). If the training provides good theories, the observation of an expert while he/she applies the theoretical approaches, the practice of participants, and a feedback about the way they practiced, we can expect that teachers would apply the new professional knowledges, regardless of the classrooms' or schools' features in which they work.

An excessive emphasis on what features a training risk to overlook the complexity of teaching action

(Grossman, Hammerless and McDonald 2009). The core aspect of such complexity refers to the task of integrating "the what" to teach, "the how" to teach, and "the why" choosing to teach according to a certain teaching method, rather than another (Gentile 2012). According to this hypothesis, teachers' professional development depends on the connections between subject-matter and teaching methods (Shulman and Shulman 2004). Following this line of reasoning, we developed a research-training framework called "Teacher Education Via Video" (TEVV), in which content and pedagogy must be intended as a whole, in order to understand the principles and procedures on which a certain strategy is based, and the connections between the strategy itself and learning, the building of knowledges and the skills to apply them (Gentile and Tacconi 2018; Shulman 1986). In brief, we are focusing on how teachers shape their learning (Lieberman and Pointer Mace, 2008).

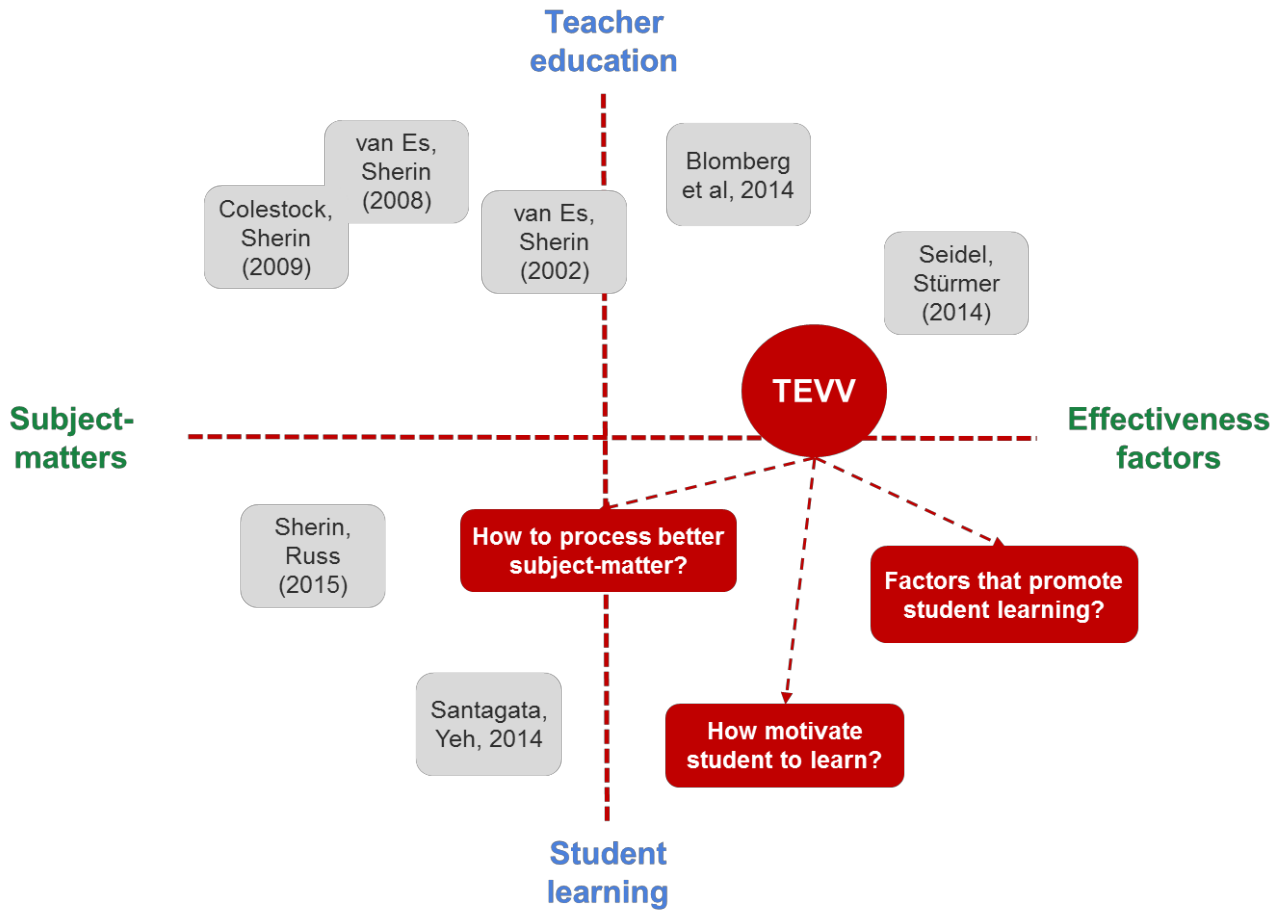
TEVV is a research-training framework that poses the digital video tools to help the development of pedagogical knowledge about the high effect-size factors in teaching and learning processes (Hattie 2009; 2012). The research-training framework is articulated into three studies. The first study described a *professional vision model* and the cognitive processes that features it are (Gentile and Tacconi 2016; 2018). The second study is aimed to give an empirical base (Sherin and Russ 2015) to the *professional vision model* through a 20-hours teacher training that involved 53 teachers of 8 middle and high schools. The third study is focused on the impact of the relationships between digital videos and teacher training strategies (Seidel and Stürmer 2014). We get data about this third line of research through an experimental that involved 80 future teachers engaged in an academic course.

The research-training embraces three topics: a) the methods and tools of teacher education; b) what works in teaching and learning; c) the cognitive and motivational processes of students. To grasp the connections between the three topics, the Picture 1 shows the conceptual of TEVV regarding to dimensions. The first dimension captures the relation between subject-matters and effectiveness factors, outlining "what" and "how" we teach. The second dimension defines the relation between student learning and teacher education. This dimension implies a connection between teachers' learning and students' learning.

These labels present a more explicative and wide meaning of the field of investigation in which the framework is placed, as well as it offers the chance to allocate individual authors, research-training and models that researchers are carrying on in different countries. The authors positioned in the semantic field are representative of trends that we consider an important benchmark. The quoted studies reflect empirical researches and theory focused on the use of videos as training tools in pre-service and in-service teacher education. This explains the gap in the quadrant that intersects the student learning/effectiveness factors.

The red circle draws the positioning of TEVV framework. The framework is focused on teacher education and the design of trainings. We are interested on how helping teacher to build pedagogical knowledge. For these reasons, we are interested to explore these issues: which student or teaching factors can help teachers to work with student thinking? How they can help student to process better the subject-matter? How they can motivate student to learn?

PICTURE 1. CONCEPTUAL POSITIONING OF TEVV RESEARCH-TRAINING FRAMEWORK



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The paper is articulated in four sections. The first section shows the details of a *professional vision model*, intended as a process that teachers use to watch and think to the teaching facts (Gentile and Tacconi 2016). The second and third sections present show three training strategies associated to the use of videos in teacher professional learning (Gentile and Tacconi 2018; Seidel and Stürmer 2014). The last one shows a fourth strategy called "video club". It consists of a group of teachers who meet to watch and discuss excerpts of videotapes of their instruction (van Es and Sherin 2008).

A professional vision model

The videos of teaching actions became one of the most used tools both in academic courses and in teacher training. Their use has been gradually affirmed, until becoming one of the most used instruments in improving the quality of teaching (Calandra and Rich 2015; Gaudin and Chaliès 2016). This fact suggests an accurate consideration and research programs with the aim of understanding if and how videos can help teachers increasing their professional knowledge (Bakkenes, Vermunt and Wubbels 2010; Lieberman and Pointer Mace 2008). For example, pre-service teachers struggle in understanding the complexity of teaching events, so as to perceive themselves as unable in applying the pedagogical theories studied in academic courses (Seidel and Stürmer 2014). Training teachers to the ability of analyzing video can become an activity aimed to the promotion of high-quality professional knowledge. In relation to this the issue is: with which training strategies and tools pre-service teacher can live an experience of vicarious learning (Bandura 1986) in order to facilitate the access to a richer set of pedagogical facts and principles? A high ability of analyzing the teaching fact can promote the ability of applying professional knowledge to a wide teaching context. On the other hand, a low level can indicate the presence of a system of fragmented knowledge weakly organized. Consequently, one of the priorities of academic courses for teachers should be building an integrated system of pedagogical and practice knowledge. This priority implies the elaboration of a *professional vision model*.

Teacher professional vision

What teachers observe about themselves and others depends on knowledge and reasonings that take place during the work experience. So, it is possible to identify a system of situated cognitions consisting of beliefs, knowledge, experiences, frames. We call it *professional vision*: a subjective way of looking at events that occur in a specific professional field (Gentile and Tacconi 2016). While watching a video, teachers tend to highlight educational situations that are noteworthy and reflect on them with the purpose of searching meaning to what they see (Van Es and Sherin 2002). The training activities should help teachers to create a close relationship between “what I see” and “what I think” (Blomberg et al. 2014). But which are the operations activated by teachers during the vision of videos? The TEVV framework suggests a process articulated in four operations.

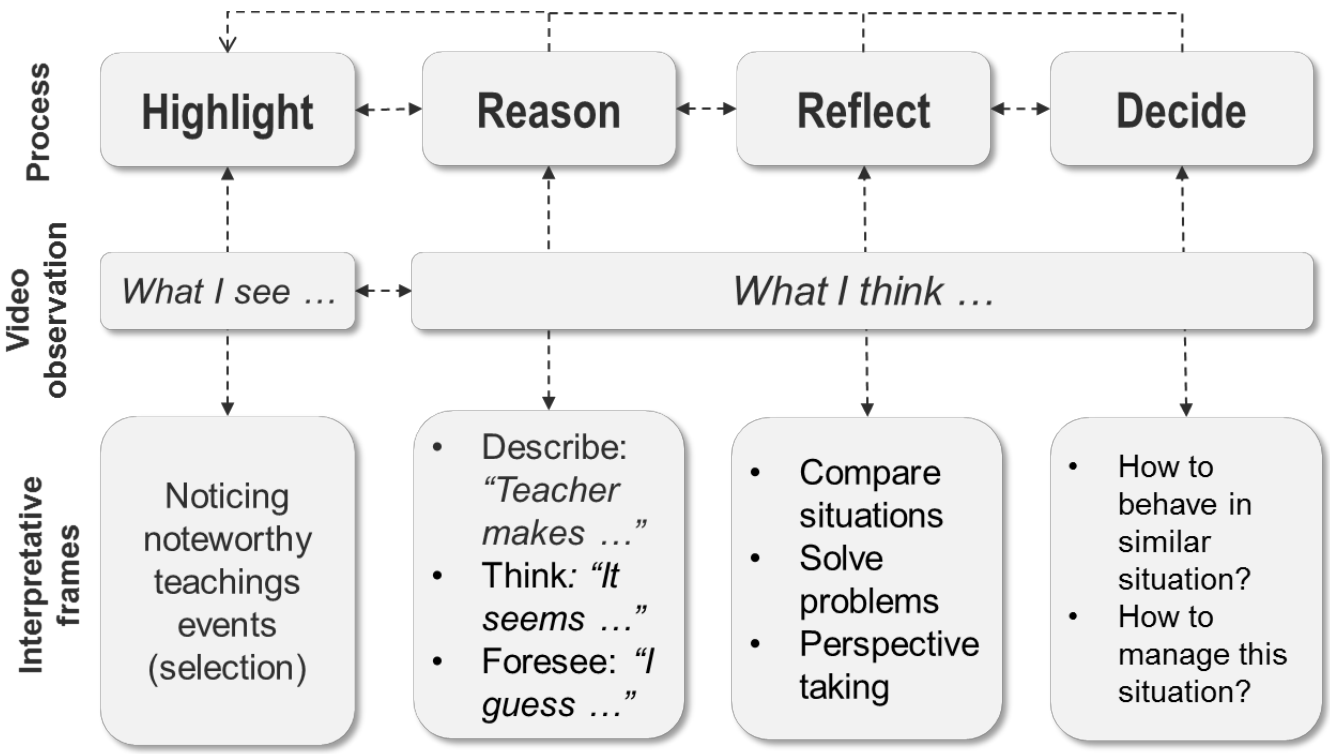
1. *Highlight*. It means the teacher selects the content of videos noticing the most relevant educational fact (van Es and Sherin 2008; Seidel and Stürmer 2014; Seidel and Shavelson 2007).

2. *Reason*. It means the teacher thinks on what observed activating three operations: a) describe (“teacher makes …”); b) think (“I think that…”; “I believe that…”, “It seems to me that…”; c) foresee (“I imagine that…”; “I expect that…”) (Seidel et al. 2011; van Es and Sherin 2002).

3. *Reflect*. It means the teacher compares situations, makes assessments, identify him or herself in the videotaped teacher, think on how to solve the observed teaching problems (Colestock and Sherin 2009; van Es and Sherin 2008).

4. *Decide*. It means the teacher thinks of how to respond to students in the case he/she would have to face situations like the ones in the videos: "How would I have acted…?"; "how would I have managed …?" (Sherin and Russ 2015; Rodgers, 2002).

PICTURE 2. PROFESSIONAL VISION MODEL



Source: (Gentile, Tacconi 2016)

The Picture 2 shows the *professional vision* as a subjective process that teachers use to watch and think to the educational facts that occur in the classroom during the vision of the videos (Sherin and Russ 2015). During video observation, teacher activate clusters of interpretative frames in relation to four operation highlighted in the model.

Professional vision and pedagogical knowledge

In the videos are contained several educational and teaching events. Some of them play a critical role in student learning, some others not. The identification of a noteworthy event consists in the teacher's ability in paying attention to aspects that are crucial in the learning process of students (Seidel and Stürmer 2014). In this case, videos work as first stimulus of knowledge activation (Kersting 2008). But, on which elements should we focus? The meta-analysis, elaborated by Seidel and Shavelson (2007) and by Hattie (2009,

2012) on the effects of a range of educational, cognitive and motivational factors, offer a first knowledge base (Table 1). Seidel and Shavelson (2007) indicate the followings between the factors that can have a significant impact on learning: a) goal setting; b) orientation of learning towards goals; c) activation of student thinking through challenging tasks; d) support student through constructive feedback; e) supportive learning climate by taking students' needs seriously. From Hattie (2009; 2012) the TEVV framework assumes the following factors: a) how to develop high expectation for each student; b) how to provide better feedback to student; c) reciprocal teaching; d) teacher-student relationship; e) how to better teach metacognitive strategies; f) teaching study skills.

TABLE 1. LISTS OF HIGH-EFFECT SIZE FACTORS

Seidel and Shavelsons' meta-analysis (2007)*	Hattie's meta-analysis (2009, 2012)**
1. Goal setting	1. How to develop high expectation for each student
2. Orientation of learning towards goal	2. How to provide better feedback to students
3. Activation of student thinking through challenges tasks	3. Reciprocal teaching
4. Support student through constructive feedback	4. Teacher-student relationship
5. Supportive learning climate by taking students' needs seriously	5. How to better teach metacognitive strategies
	6. Teaching study skills

*Source: Adapted from: (Seidel, Shavelson 2007.)
**Source: Adapted from: (Hattie 2009, 2012)

Why do we consider these lists? Most of these factors can be subject of video-observation, consequently they can be elements of professional knowledge to include in teacher education. The hypothesis is that a good professional vision implies the ability to think about teaching drawing on their own pedagogical knowledge (Shulman 1987). If professional vision is nurtured by the knowledge of what works in teaching and learning (Hattie 2009; 2012), the integration of these with content knowledge and experience video-taped may form a system of professional cognitions that shade light on those elements that have a critical role in students learning.

Application of the professional video model in a 20-hours teacher training

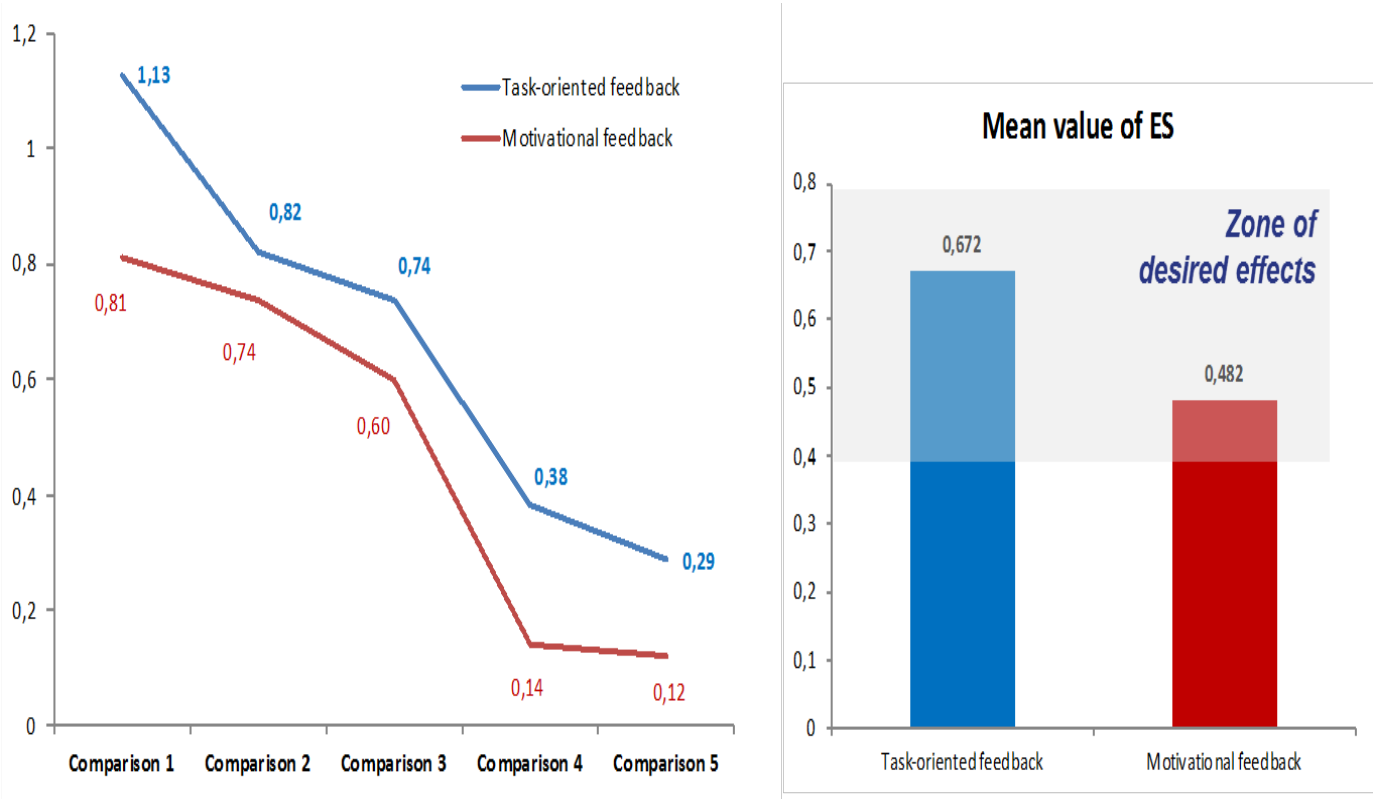
A 20-hours teacher training was designed in order to apply the professional vision model to a teacher education activity. The teacher training had two aims. Firstly, help the development of pedagogical knowledge about a high-effects size factor in teaching/learning processes. I refer to "how to provide a better feedback to students" (Hattie and Timperley 2007). In Hattie's meta-analysis (2009; 2012), feedback has a 0.75 ES, calculated upon more than 1.000 studies. Secondly, give an empirical base to the professional vision model. In relation to the second goal we collected 51 interviews. Each teacher observed his video-taped feedback activity performed in the classroom. The teacher stopped the player every time he noted a noteworthy fact. Right after the stop the teacher commented aloud his stopping point. All the interviews were video-taped. We involved 53 teachers of middle and high school. The total of involved schools was 8, all sited in the Province of Verona and Venice.

How to provide a better feedback to students: a three facets model

The section discusses a brief theoretical and empirical summary on "how to provide a better feedback to students". With the feedback, the teacher formulates responses, gives corrective indications, offers insights on "how" and "why" a result was achieved (Hattie 2012). We can term this feedback as task-oriented feedback. Another kind of feedback consists in praises, positive reinforcements, social recognitions (Heitnik et al. 2016). The main goal of this second kind is to motivate student to learn. We can term it a motivational feedback. The feedback may be more effective if is "just in time", "just for me", "just for where I am" in the learning process (Hattie 2012, p. 122). We can term it as a student-oriented feedback. The effect on learning is greater when the goal of feedback is to provide instructions to improve the performance of a task; in contrast, we observe lower level effects when teachers communicate praises or positive reinforcement (Hattie and Temperley 2007).

The Picture 3 shows five comparisons of couples of studies in which researchers calculated the ES of feedback and praises on student learning (Hattie and Temperley 2007). In all comparisons the task-oriented feedback has a better effect on student learning if compared with praises and positive reinforcements. In studies that evaluate the effect of task-oriented feedback, the mean value of ES is 0.67. Conversely, the mean value for praises and reinforcement is 0.48. However, according Hattie's meta-analysis (2009, 2012) both values fall in the zone of desired effects. We didn't tell teachers about not praising students. We suggested to mix the three typologies of feedback, by mostly focusing on task-oriented feedback.

PICTURE 3. TASK-ORIENTED FEEDBACK VS MOTIVATIONAL FEEDBACK



Source: Adapted from: (Hattie, Timperley 2007)

Different are the moments in which to communicate feedbacks: a) after the correction of a written test or during an oral test (Gentile and Ramellini 2000); b) while students carry out an assignment or a project, individually or in group (van de Pol et al., 2012); c) during a classroom discussion (van de Pol et al. 2011; Voerman et al. 2012). The 53 teachers involved in TEVV provided feedbacks to students across 13 different teaching situations. For example, we collected 16 videos in which the feedback was used after the correction of a test. In 7 of them, the feedback was communicated during a group project. In 5 videos, the feedback was communicated during a group work. In 4, during a personal project, and so on.

Four training activities and vision protocol

The 20-hours training was divided into four activities: a) a kick-off meeting; b) three workshops; c) videotaping of activities performed in the classrooms; d) video observation of own activity performed in the classroom (Picture 4). Below, some details about the fourth training activity because it is closer to the use of video for building a system of professional situated cognitions. Through it, we collected data in order to give an empirical base to the *professional vision model*. The hypothesis is that the video

observation may promote the teacher's professional knowledge. To collect data, the video observation was designed following three phases.

1. *Introduction* the vision of video with the following statements: "We will watch together the videotape of your lesson. You can stop the vision in any moment and comment what you have seen".

2. *Stopping point and comment* (Jacobs and Morita, 2002). Right after the stop, we encouraged an analysis by formulating two questions. The first is a prompt question: "What have you seen here?" The second is a probe question: "Have you noticed anything else?" or "Do you want to add something?"

3. *Vision closing*. To conclude the analysis, we posed three questions: "How do you think you managed the feedback during the practice?"; "Which aspects of the feedback do you think you used more and how you used them?"; "How have you seen yourself, and what have you seen of yourself?"

The video observation was taper and once the vision protocol was concluded, we turned off the taping of the interview and gave a feedback to the teacher, expressing appreciations and suggesting improvements or integrations.

PICTURE 4. THE FOUR TRAINING ACTIVIES OF THE 20-HOURS TEACHER TRAINING VIDEO OBSERVATION

Source: Own

Method and contents of analysis

The analysis of the interviews is focused on three elements. Firstly, the number of stopping points. It is useful and interesting to understand how the stopping points are distributed, for example, in respect to teachers' background variables (e.g., sex, age, grades, seniority, professional status, subject-matter, teaching situation, etc.), and if a high or low number of stopping points per teacher can be correlated to one or more background variables. Secondly, number of comments and content units. After a stopping point, the teacher started commenting what he or she had been noticed. Thanks to the stopping point the teacher demonstrates to have selected a noteworthy aspect. Changes of focus during a comment allow the identification of content units (Jacobs and Morita 2002). Our objective is understanding how the content units are distributed, considering the background variables, and if a low or high number of content units can be an indicator of high or low level of professional vision competence. Thirdly, *interpretative frames*. The goal is understanding with which *interpretative frames* teachers observe the videos. For instance, a way to vision a video is to relate events by "cause and effect" (Sherin and Russ 2015). Another way is to identify "specific elements" that take place across multiple teaching context (Sherin and Russ 2015, p. 11). The purpose is figuring out which and how many of these schemata trigger during the vision, how they connect to content units, how they activate each other, and if they can be classified in more general cluster, corresponding to the four general cognitive operations of *professional vision model*.

Two training strategies and the use of video in pre-service teacher education

The simple vision of a video is not enough in order to generate an accurate comprehension of the teaching/learning processes. The effectiveness of such instruments depends on the training strategies that are put into action (Seidel and Stürmer 2014).

Rule-example vs Example-rule

Referring to a classification proposed by Seidel and colleagues (2013, p. 58), two overall teaching strategies can be highlighted, both oriented to the development of professional vision competence. The first strategy presents the pedagogical principle to pursue, followed by an example of application through a video. The authors define this strategy as rule-example. The second strategy firstly shows the video. Afterwards, it asks teachers to note teaching facts, facilitating the learning of new pedagogical knowledge that help to do better in classroom. The authors define this strategy as example-rule.

In the rule-example strategy, teachers receive fundamentals of pedagogical knowledges. Then, they are asked to watch a video and to take notes, to think on what noted, recalling the pedagogical knowledge earlier received (Seidel, Blomberg and Renkl 2013). The focuses of observation are expert teachers, videotaped during the performance of successful activities: exemplary lessons, with total or near-total absence of critical incidents and with positive feedback from the students. In this case, the stimulated

reasoning would sound like this: “it is good to do so, if you want to achieve a good educational finding”. It is mostly practiced in pre-service teacher education, in order to teach fundamental pedagogical knowledge, or the use of educational principles and teaching strategies that work. The overall scope is learning to vision applying a system of pedagogical knowledge. The rule-example strategy can be defined as a strategy of direct instruction.

In the example-rule strategy, before the vision of the video, it is not provided any pedagogical knowledge about principles, teaching strategies and research evidences (Seidel, Blomberg and Renkl 2013). Teachers observe their videos or other teachers’ videos, they take note about what they’ve watched, subsequently they acquire pedagogical knowledge with the aim of improving their teaching methods. The vision of their own videos can be done individually or shared with colleagues of their own school (see the next section).

The observation of personal teaching actions may improve the professional vision competence. The hypothesis is that the exercise of vision would produce a gradual improvement of own teaching practices (Kleinknecht and Schneider 2013; Tacconi and Mejia Gomez 2012). The videos can give back to the observers the knowledge about facts that during the classroom teaching remain in the background (Borko et al. 2008; Snoeyink 2010). The general scope is learning to vision the teaching practice, searching useful knowledge to solve the educational problems met in classroom. The perspective is about professional development finalized to improve personal teaching competences. This second strategy refers to knowledge construction approach, in which it is stated that learning is meaningful when is the outcome of a process of guided discovery (Lucariello et al 2016).

After this general distinction, it is necessary to affirm that, regardless of whether it works in academic courses or in-service training activities, researchers and trainers can provide hybrid purposes, while working with one of the two strategies or on of the two categories of teachers: pre-service or in-service teachers.

Digital videos and teacher training strategies: direct instruction vs knowledge construction

We recently closed an experimental study that involved 80 future teachers engaged in a academic course for attaining a national qualification in special education. The teachers were randomly assigned to two experimental conditions. The teachers watched two clips in which two teachers communicate feedback to student with special educational needs. One group worked to the videos with a *knowledge construction approach*, the other one worked with a *direct instruction approach* (Blomberg et alii, 2014). The Table 2 shows the methods used for leading the two training activities.

In each experimental condition we designed five training activities. We have chosen activities that could well feature an experimental condition, putting it in contrast with the other one. The first condition is featured for an activity of discovery and sharing with peers. The second is featured by activity of understanding and applying pedagogical knowledge about the feedback. Two different researchers lead each condition. At the end of each training we collected data on teachers' background variable, on three facets of feedback, on perceived individual change after participation to the training, on self-efficacy ("how much feel me skilled to communicate feedback to the students"). Two the aims of the study: a) verify if the groups differentiate the responses at the treatments in relation to feedback, perceived individual change and self-efficacy; b) verify if there is an interaction between the treatments and the background variables in the same dependent variables.

TABLE 2. SEARCHING THE RELATIONSHIP BETWEEN DIGITAL VIDEOS AND TEACHER TRAINING ACTIVITIES

STARTING AT 2:00 P.M. *Each group together for a general presentation*			
Timing	Knowledge construction approach: training activities	Timing	Direct instruction approach: training activities
15'	First vision of clips on feedback and production of individual notes.	30'	Brief lesson on "how to provide a better feedback to students".
60'	Sharing notes in small groups.	25'	Comprehension test: 10 questions answered in small group.
60'	Sharing notes in whole class.	45'	An instructional design task in 3 phased: individual, pair, small group.
Break 3:30 p.m.		Break 3:45 p.m.	
15'	Second vision of clips.	60'	Examples: presentation of two teaching cases.
45'	Data collection.	60'	Vision of clips and data collection.
ENDING AT 6:00 P.M			

Source: Own

Activate professional vision through "video club"

In the previous sections we have discussed three video-based training strategies thought in relation to the *professional vision model* presented in Picture 2. The use of digital videos in teacher education may help teachers to improve their teaching activity considering what works in teaching and learning. This section provides a brief view of a fourth strategy called "video club". Video club consists of a group of teachers who meet to watch and discuss videos from their own classrooms. The essential elements of a "video club" are three: a) a series of meetings scheduled during school year; b) each teacher shares clips from his or her own classroom 2 or 3 times throughout the year; c) an average of two clips being watched and discussed at each meeting (van Es and Sherin 2008).

Each "video club" meeting has two phases. Prior to meeting, a researcher videotaped teachers' lessons. During the videotaping, the researcher attempts to capture the key facts, for example, zooms out with the purpose to record much of the interactions that took place in the classroom. After taping, the same researcher reviews the video and identifies noteworthy points. For example, the researcher highlights an

excerpt in which students show some confusion about a teacher's explanation. For each classroom, one 5-7 min long excerpt is selected, and a relative transcript is prepared. During the meeting, the researcher assumes the role of facilitator, begins the discussion, introducing, for example, the main subject-matter themes and the context of the lesson. The facilitator prompts the teachers to examine students' responses to teacher's explanation, their ideas, thinking and understandings about subject-matter. In order to promote the teachers' analysis, facilitator may formulate questions ("what did you notice"; "If Philip knows mathematical facts, why he didn't answer to teacher's questions?"); encourage teachers in using evidences from video ("what did you see in the clip that makes you state that") or in interpreting what they observed ("What about Philip's understanding of calculation rule?").

From that description, both the facilitators and teachers play an important role in shaping the discussions during the meetings (van Es and Sherin 2008). The facilitator does not have dominant perspective about what are 'worthy interpretations. Teachers can offer and debate a variety of interpretations. For these reasons, the main goals of "video club" are the following: a) identifying the noteworthy events in a teaching situation; b) using knowledge from one's context (school, classroom, subject-matter) to reason about these events; c) making connections between specific teaching facts events and pedagogical knowledge (principles of teaching and learning, strategies, student thinking, etc.).

The shared vision can have both potentialities and limits. For example, among potentialities, it can underline the identification process among colleagues. Discovering that a colleague faces teaching problem like their own can reduce the gravity of personal difficulties and offer sprouts for a possible solution. A second potentiality is the shared interpretation of the educational facts, and a discussion about alternative teaching solutions (Borko et al. 2008; Harford, MacRuairc and McCartan et al. 2010).

Among the limits, it was found the reject to carry out in-depth analyses of personal videos, on behalf of the teachers and of their colleagues, a reaction that could take place in the context of group dynamics (Eraut 2000). Different measures can reduce these limits. A first one is the definition of mutual norms of respect and trust (Lasagabaster and Sierra 2011; Ostrosky et al 2013). The teachers need to perceive a safe interpersonal climate, in order to decide to commit themselves in the analysis, discussion and interpretation on their own videos (Borko et al. 2008). A second measure is assuring teachers that videos do not have evaluative purposes, and that the content of videotapes and of discussions will not be for any reason disclosed outside of the teacher education setting (Snoeyink 2010). A third measure consists in defining a good mix between shared vision and individual vision (Borko et al. 2008). The shared vision focuses the attention on a selection of events common to all videotaped teachers. In contrast, the individual vision can focalize on the integral vision of their own video. In this way, it is suggested to properly organize the

vision, following for example the vision protocol described in the second section of this article, since the task of observing oneself is more complex than the task of observing a colleague (Kleinknecht and Schneider 2013).

Conclusion

Teaching is a complex job and we have proposed to explore this complexity trough the *professional vision model* (Gentile and Tacconi, 2016) and the use of digital videos in the teacher education (Lieberman and Pointer Mace 2008). This complexity implies the integration of "what", "how", "why" teaching a subject-matter according to broader principles of teaching and learning (Gredler 1992). According to this hypothesis teachers' professional development depends on the connections between subject-matter and pedagogical knowledge (Shulman and Shulman 2004). Subject-matter and pedagogical knowledge should be kept together in such a way as to understand the principles of a teaching strategy and the connections that it has with subject-matter, students, classroom practice, and so on (Shulman 1986).

The video-based teacher education works if the use of video is integrated in a broader training strategy, and above all, the *professional video model* guides the teacher instructors to facilitate the selection of meaningful teaching facts, the reasoning about these facts, the connection between facts and pedagogical knowledge.

It can mix training strategies according to the recipients and learning contexts. The golden rule could be the following: in academic course it's better to adopt a rule-example strategy that helps pre-service teachers to understand and apply pedagogical knowledge. In contrast, in the in-service training it's better to adopt a knowledge construction approach that help in-service teachers integrate new pedagogical knowledge in the own system of situated cognition. It can consider the "rule-example" as a *direct instruction* strategy, while the "example-rule" and "video-club" as *knowledge construction* strategy. The 20-hours teacher training, described in the second section, could be a good mix between two strategies.

Like any other adult learning activity, the design of video-based teacher education is labor intensive. There are have two orders of problems. Firstly, designing and selecting contents and pedagogical knowledge (Shulman 1986), designing and selecting teacher training strategies (Blomberg et al. 2014). Secondly, proofing the use and maintenance along the time of what has been learned (Baldwin and Ford 1988), consequently, evaluating the impact of teachers' professional knowledge on student learning (Dagen and Bean 2014). In designing a video-based learning academic course or a teacher training for professional development, the most complex work consists into the care of the teachers' learning process: from understanding to transferring the professional knowledge into the work (Salas and Cannon-Bowers

2001). We should focus our attention on these elements. It is the system of learned professional knowledge that can make the difference in innovation and quality of teaching.

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