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Teacher learning from analysis of videotaped classroom situations: Does it make a difference whether teachers observe their own teaching or that of others?

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ABSTRACT

This study uses an experimental approach to investigate effects that analyzing videos of one's own versus others' teaching and experience with video has on teacher learning, particularly on knowledge activation and professional vision ($N = 67$). Teachers who analyzed their own teaching experienced higher activation, indicated by higher immersion, resonance, and motivation. Contrary to our assumptions differences with regard to professional vision were not straightforward. In tendency, teachers noticed more relevant components of teaching and learning but were less self-reflective with regard to articulating critical incidents.

Video has become a widely used tool in teacher education and teacher learning (Brophy, 2004; Goldman, Pea, Barron, & Denny, 2007). Teachers may observe video recordings of either their own teaching (Borko, Jacobs, Eiteljorg, & Pittman, 2008; Krammer et al., 2006; Roth, 2009; Sherin & van Es, 2009) or the teaching of others (Bliss & Reynolds, 2004; Krajcik et al., 1996; Rosaen, Schram, & Herbel-Eisenmann, 2002; Seago, 2004). The video material may consist of "edited" selections of classroom sequences (Borko et al., 2008; van Es, 2009) or "raw" data from classroom lessons and units (Schwindt, 2008; Stigler & Staley, 2002). The type of video material observed—e.g., examples of good teaching practices rarely observed in regular classrooms (Lampert & Ball, 1998; Seago, 2004) or examples of typical classroom lessons (Clarke et al., 2008)—may depend on the learning objectives.

A look back at the history of research in teaching and teacher education shows that the use of video analysis has changed in line with technological developments (Sherin, 2004). In particular, advances in digital videography, software development, and online tools have led to a substantial increase in the use of video in teacher education (Goldman, 2007; Hiebert, Gallimore, & Stigler, 2002; Krammer et al., 2006). Video-based teacher professional development and teacher learning research is shared internationally and diverse ways of using video are common in most countries (Santagata, 2009). However, surprisingly little is yet known about its specific effects on teacher learning or whether its objectives are actually met. As pointed out by Sherin (2004):

> Despite these many changes, the idea that it is useful for teachers to be videotaped and to view videotapes of teaching has remained constant. Watching videotapes of instruction has been found to be motivating for teachers, and in some cases to promote change in teachers' practices. It appears that video has become a permanent fixture in teacher education. What is surprising, however, is that despite its extensiveness, the use of video in teacher education does not always reflect an understanding of precisely what it is about *video* that might provide support for teacher learning. (p. 10)

The goal of the research presented in this article is to further the understanding of the specific effects of video analysis on teacher learning, particularly on knowledge activation and professional vision (noticing and knowledge-based reasoning). To explore this issue we focus on the selection of video material. Specifically, taking

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an experimental approach, we analyze systematic differences between two types of video material: recordings of *teachers' own teaching* and of *other teachers' teaching*.

The present study is embedded in the IPN Video Study (Seidel & Prenzel, 2006; Seidel et al., 2006; Seidel, Rimmele, & Prenzel, 2005), a 6-year project investigating typical science teaching practices in German and Swiss classrooms and their effects on student learning. In this context, 250 science lessons were recorded in random samples of 8th and 9th grade classrooms. The participating students were tested and surveyed several times during the school year; their teachers were interviewed about their views and practices of science teaching. The study served as the basis for selecting the present sample of teachers (Seidel et al., 2009). An important finding of the IPN Video Study was that German science classrooms are quite homogenous (Seidel & Prenzel, 2006). It provided us with video material from a variety of teachers that did not vary to a high degree in methods and approaches they used. The IPN Video Study thus builds a starting point for continued research on video-based teacher learning and professional development in science education.

The present study has both theoretical and practical implications. Investigating how teachers react as they engage with different video material will advance our understanding of the nature of teacher cognition and of the relationship between video material and teacher learning. In addition, the results of this study will provide valuable information for researchers, educators and practitioners worldwide whose design and facilitate video-based teacher education and professional development.

1. Video analysis as an activating experience

Researchers and practitioners argue that it is cognitively activating to work with video. Lemke (2007), for example, points out that video allows teachers to actually "experience" teaching. Miller and Zhou (2007) refer to video as a vivid "secondhand" experience. Video is attributed the potential to provide teachers with enough information to be "inside" an event. Goldman (2007) uses the term *immersion* to describe the effect that video has on a deep level of engagement and involvement with the topic, and expresses the ability to make connections to one's own situation as *resonance*. Resonance can refer to own teaching experiences, known teaching practices of colleagues or teaching methods that are typical in a cultural setting.

Moreover, video presents complex classroom settings in an *authentic* way (Schwan & Riempp, 2004; Spiro, Collins, & Ramchandran, 2007). It allows learners to make multiple connections to their own teaching and to activate prior knowledge and experience. The experience of authenticity positively affects *intrinsic motivation* and interest in a domain (Deci & Ryan, 1985). As Sherin (2004) points out video has been shown to be motivating for teachers. From this perspective, video offers unique opportunities for knowledge activation. It is thought to facilitate learner experiences of immersion, resonance, authenticity, and motivation.

However, the available research provides few insights into teachers' experiences of watching videos of their own teaching versus others' teaching. Contrasting hypotheses have been formulated. On the one hand, researchers have argued that teachers should observe their own teaching and have demonstrated positive effects of this approach on teachers' motivation and on the activation of prior knowledge and experience (Baum & Gray, 1992; Borko et al., 2008; Paul, Dawson, Lanphear, & Cheema, 1998; Pinsky & Wipf, 2000). On the other hand, it has been argued that watching one's own teaching activates person-related knowledge structures and self-schemas (Fiske, 1995), resulting in increased self-attention. Motivational processes are influenced, especially when video data does not match self-related constructs. Emotionally activating video excerpts (e.g., critical classroom incidents) have been shown to have negative effects on motivation and learning because of the observer's reduced ability to process information and to reflect critically (Krone, Hamborg, & Gediga, 2002).

To summarize, researchers and teacher educators argue that video analysis facilitates knowledge activation. The available empirical findings suggest that watching one's own versus others' teaching has differing effects.

2. Teachers' professional vision: noticing and knowledge-based reasoning

Beside empirical findings on how teachers experience video-based learning, the present study draws on professional vision (Goodwin, 1994) as an important element of teacher expertise. Based on the idea that the ability to observe what is happening in a classroom is a key characteristic of professional vision, video analysis has become an important tool in the context of teacher learning (Berliner, 1986; Putnam & Borko, 2000; Sherin, 2004). The ability to observe "involves perceptual processes, it is not passive, and along with all perceptual processes, professional vision is characterized by bottom-up as well as top-down processes" (Sherin, 2007, p. 384). There are two major components to these perceptual processes: selective attention and knowledge-based reasoning (Sherin & van Es, 2009; van Es & Sherin, 2008). Both components affect what is noticed and how events in a classroom are interpreted—they are the basis of teachers' professional vision (Goodwin, 1994).

2.1. Selective attention: noticing

The classroom is a complex environment in which many things happen simultaneously. Teachers cannot pay equal attention to all classroom events. Instead, certain events stand out and teachers hone in on situations that are of special importance to them. van Es and Sherin (2008) used the concept of "noticing" to describe the process by which teachers identify what is relevant in a classroom situation. Frederiksen, Sipusic, Sherin, and Wolfe (1998) introduced the term "call out" to refer to points at that teachers literally "call out" when they see something that is important to them. Jacobs and Morita (2002) used the term "stopping point" to describe points at which teachers pause and comment on classroom events.

Having teachers watch videotaped examples of classroom situations provides an opportunity to investigate the points at which teachers pause and comment and the aspects that attract their attention. In so doing, researchers are interested in whether and to what extent teachers notice aspects that are of particular importance to student learning and to the representation of subject matter (Borko et al., 2008; Kersting, 2008; Kobarg, 2009; Krammer et al., 2006; Miller & Zhou, 2007; Santagata, 2009; Sherin & van Es, 2009; Star & Strickland, 2008). For instance, Sherin and van Es (2009) investigated the extent to which teachers shifted their attention from a primary focus on the teacher to student learning of mathematics during long-term teacher professional development. Borko et al. (2008) examined teachers' noticing of student thinking, pedagogy, and mathematical thinking. Kobarg (2009) analyzed the extent to which teachers addressed components of teaching and learning that are relevant to science instruction in their written comments on video situations (e.g., goal clarity and coherence, teacher guidance, mistake culture, scientific inquiry). Although the present study does not target long-term teacher learning, these research findings provide useful indicators of teacher noticing that