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A successful professional development program in history: What matters?

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HIGHLIGHTS

- A PDP with timelines showed significant student learning gains in history.
- Educative curriculum materials contributed to the success of the PDP.
- Feelings of autonomy and competence stimulated teachers' intrinsic motivation.
- Teachers' beliefs and attitudes changed during the PDP.
- Teachers' instructional behavior appeared to relate to student learning gains.

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ABSTRACT

This study focuses on a successful Professional Development Program for improving students' understanding of historical time, consisting of a training and the implementation of Timewise, a teaching approach in which timelines were used consistently. The PDP was carried out with 16 elementary school teachers in grades 2 (ages 7-8) and 5 (ages 10-11). Results indicate that the highest student learning gains were reached by teachers who successfully implemented the instructional behavior aimed at, while using educative curriculum materials. The clear structure of Timewise and the user-friendly materials, which included room for autonomy, supported teachers in their learning and teaching.

1. Introduction

In the past decades multiple reviews discussed professional development programs (PDPs) of teachers, although PDPs in the field of social studies are rare. However, in the fields of science and mathematics many studies on K-12 teachers' professional development provide insights, into the question under what conditions, why, and how teachers learn (see e.g., Kennedy, 1998; Loucks-Horsley & Matsumoto, 1999; Penuel, Fishman, Yamaguchi, & Gallagher, 2007; Blank, de las Alas, & Smith, 2008; Blank & de las Alas, 2010; Sztajn, Campbell, & Yoon, 2011). Not so many studies include measurements of student learning outcomes and even less studies focus on the relation between specific features of the PDP and student learning (Kennedy, 1998; Knapp, 2003; Van Veen, Zwart, & Meirink, 2012). According to Hattie (2005) too little focus on the improvement of student learning could be a reason for lack of success of PDPs for teachers.

The present study focuses on a PDP aimed at the improvement of students' understanding of historical time. The understanding of historical time is a very important part of the learning of history and essential for understanding events in today's society (Barton & Levstik, 2004; Wilschut, 2012). Understanding historical time includes reasoning about change and continuity, which is considered to be a core concept of historical thinking (Lévesque, 2008; Seixas & Morton, 2013) and of historical consciousness (Grever, 2009; Rüsen, 2012; Seixas, 2006). However, research indicates that the teaching of historical time in elementary schools, at least in England and the Netherlands, does not always lead to optimal student learning outcomes (De Groot-Reuvekamp, Van Boxtel, Ros, & Harnett, 2014; Ofsted, 2011; Wagenaar, Van der Schoot, & Hemker, 2010). In the PDP in this study teachers adopted a teaching approach, named Timewise, in which they consistently made

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connections between historical events and the timeline, while using stories, pictures and videos to develop their students' understanding of time. In a previous study, we investigated the effects of the implementation of the Timewise approach on students' learning outcomes in a pre-/post-test design with students in grade 2 (ages 7–8) and grade 5 (ages 10–11) in an experimental (n = 396) and a control condition (n = 392). Linear mixed model analyses showed that students in grade 2 as well as grade 5 scored significantly higher on the post-test compared to the pre-test and compared to the control condition. The Timewise approach had a medium effect on students' achievements of .44 for grade 2, and .54 for grade 5 (De Groot-Reuvekamp, Ros, & Van Boxtel, 2017).

The PDP in the present study consisted of a training of two sessions of 4 h combined with curriculum materials and activities teachers could adapt to their own needs during the implementation of Timewise. Considering the short training time of the PDP the effects were remarkable, since positive results for PDPs with such a short training are rare (Desimone, 2009; Van Veen et al., 2012). Therefore, the main research question in this study is: "Which components of the PDP for improving elementary school students' understanding of historical time were relevant for the success of the PDP?" The study will focus on changes in teachers' knowledge and beliefs and their instructional behavior (Desimone, 2009; Kennedy, 2016), as well as on the materials that were used to support teachers in their learning and teaching (Ball & Cohen, 1996; Davis & Krajcik, 2005; Davis, Sullivan-Palincsar, Smith, Arias, & Kademian, 2017; Remillard, 2005).

2. Theoretical background

Although research indicates that changing teachers' behavior is hard to realize, many studies identify characteristics for PDPs that could be effective in improving teaching practices. The so-called "theory of improvement" (Desimone, 2009; Van Veen et al., 2012; Wayne, Yoon, Zhu, Cronen, & Garet, 2008) defines several relationships between PDP characteristics. Firstly, the "theory of change" refers to the relationship between characteristics of an intervention and teachers' learning and behavior. Secondly, the "theory of instruction" relates to the relationship between the content of the intervention and student learning. Thirdly, the relation between structural and cultural conditions in the school is captured in the "theory of context".

The theory of improvement is represented in Desimone's (2009) much cited framework for the design, implementation and evaluation of PDP's, in which relations are shown between *design features* of the PDP, *increased knowledge and skills, changes of teachers' attitudes, beliefs, and instruction,* and *improved student learning* (Fig. 1). The arrows in Fig. 1 show that there are interactive, non-recursive relations between the different components (Desimone, 2009). Below we will elaborate on the components of this framework in relation to the PDP for the improvement of elementary students' understanding of historical time. We will finish this section with a description of the PDP in the present study (Fig. 1).

2.1. Design features of professional development programs

In studies on PDPs various design features are mentioned that could be effective for teacher learning. Next to content focus, active learning, duration, collective participation, and coherence (Garet, Porter, Andrew, & Desimone, 2001; Desimone, 2009; Blank & de las Alas, 2010; Opfer & Pedder, 2011; Van Veen et al., 2012), several authors emphasize the extent to which teachers have opportunities to integrate a new methodology into their daily work, and the need for extensive practice, with possibilities for feedback to identify success and failure (Blank et al., 2008; Borko, 2004; Knapp, 2003; Opfer & Pedder, 2011; Osborne, Simon, Christodoulou, Howell-Richardson, & Richardson, 2013; Thurlings, Evers, & Vermeulen, 2015; Van Veen et al., 2012). In their self-determination theory Ryan and Deci (2000) and Deci and Ryan (2008) also stress the need for autonomy, next to competence and relatedness, to enhance motivation and effective performance. Furthermore, the availability and usefulness of materials and resources are mentioned as influential factors for the effectiveness of PDPs (Ball & Cohen, 1996; Cohen, Raudenbusch & Ball, 2003; Davis & Krajcik, 2005; Davis et al., 2017; Hill, Blazar, & Lynch, 2015; Opfer & Pedder, 2011; Callahan, Saye, & Brush, 2013; Remillard, 2005). In addition, some review studies put forward that some of the more effective programs appeared to be directly carried out by authors or their affiliated researchers, who were familiar with the work of teachers (Kennedy, 2016; Yoon, Duncan, Wen-Yu-Lee, Scarloss, & Shapley, 2007; Guskey & Yoon, 2009). However, lists of effective design features for PDPs are also criticized, mainly because the effect of these features on teacher or student learning often remains unclear (Guskey, 2003; Kennedy, 2016; Knapp, 2003; Van Veen et al., 2012).

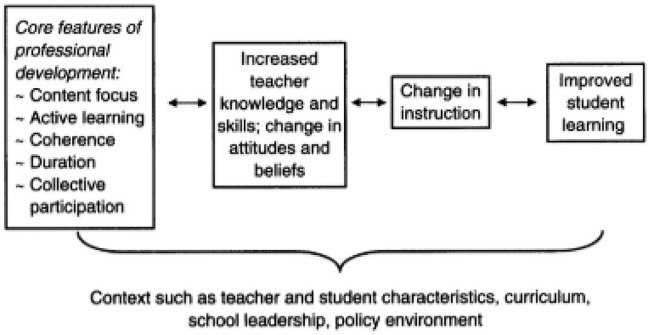

Fig. 1. Conceptual framework for studying the effects of professional development on teachers and students (Desimone, 2009, p.185).

Other researchers stress the importance of "educative" curriculum materials for successful PDPs, because carefully designed curriculum materials can support teachers as learners and contribute to teachers' professional practice and improvement of instruction (Ball & Cohen, 1996; Cohen, Raudenbush, & Ball, 2003; Davis & Krajcik, 2005; Davis et al., 2017; Lampert, 2012). For instance, in a design experiment in social studies, educative web-based curriculum materials seemed to help teachers with the development of their professional teaching knowledge (Callahan et al., 2013). PDPs need to facilitate teachers in learning how to use curriculum materials with regard to content, aims, approaches and underlying ideas, whereas materials should be carefully framed with regard to the representations of content and pedagogy (Remillard, 2005). Davis and Krajcik (2005) developed a set of heuristics for educative curriculum materials in science teaching which can be useful in other fields as well. Next to design heuristics for scientific inquiry these heuristics consist of supporting teachers in engaging students in topic-specific phenomena; in using subject specific representations; in anticipating, understanding, and dealing with students' ideas about the subject; in engaging students in questions; and in the development of subject matter knowledge. Building on these heuristics Davis et al. (2017) mention important design principles for educative curriculum materials, such as that these should offer suggestions for adaptations of lessons that would take different amounts of time and meet a range of students' needs; provide teaching tools such as rubrics, examples of key scientific ideas, and student-friendly definitions of terms; highlight important content; emphasize the rationales for the