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Fostering effective teaching behavior through the use of data-feedback

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HIGHLIGHTS

- We studied the development of effective teaching behavior.
- Connecting theory and professional practice accelerates professional development.
- A standardized observational instrument was used to assess teaching behavior.
- Teachers were professionalized in a cyclic model of data-driven teaching.
- Data-feedback proves to be a lever of change in teachers' professional development.

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ABSTRACT

In this study data-feedback in a cyclic model of data-driven teaching was used to enhance the teaching behavior of students registered in a master course for teachers. Differences between pre- and post-test measures in a simple one-group pre-test post-tests design proved to be significant with effect sizes ranging from $d = 0.29$ to $d = 0.76$. Improving teaching behavior in a time span of only six weeks on average is remarkable since earlier studies indicated that it takes over 15 years to master complex teaching skills with a 'natural development' of teaching skills of about 25% of a standard deviation.

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1. Introduction

At the start of their professional career in primary education all teachers in the Netherlands are by statutory requirement, qualified and competent to perform their job (Min. OC&W, 2004). At the same time, research has shown that it usually takes teachers a lot of time to master the more complex teaching skills. Cross-sectional studies in several European countries, for instance, revealed that teachers roughly need 15–20 years of teaching experience to develop the most difficult teaching skills like adapting instruction and classroom assignments to the relevant differences between pupils or teaching the use of learning strategies (Van de Grift, 2007, 2014; Van de Grift, Van der Wal, & Torenbeek, 2011). To date this is an important issue in the Netherlands since many teachers are set

to retire from education as the population continues to age in the years to come, as a result of which a large number of novice teachers will enter education (Min. OC&W, 2013). These novice teachers start working in an educational environment which is becoming increasingly more complex. Due to recent changes in legislation, schools for primary education in the Netherlands have moved towards a more inclusive learning environments in which a growing number of children with special educational needs will attend mainstream schools. At the same time the Netherlands, like all other European countries, is confronted with growing numbers of refugees and asylum seekers whose children, at some point, will enter the educational system. These recent developments bring about that novice teachers are confronted with a strongly diverging population of pupils. This makes it extremely important that teachers accelerate their professional development and master difficult teaching skills like, for instance, adapting teaching to the diverse needs of their pupils as soon as possible.

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The aim of this study is to investigate whether the development of effective teaching behavior can be accelerated in one of the modules of a master course in education. In this particular part of the master course, the teacher behavior of the participating teachers is observed with a standardized observational instrument. The development of effective teacher behavior is accelerated through the use of data-feedback in a cyclic model of data-driven teaching. The assumption behind the application of this model is that it enables students to make informed decisions regarding the improvement of their teaching behavior. An earlier study on the application of this model yielded positive results with regard to the teaching of beginning reading (Van den Hurk, Houtveen & Van de Grift, 2014). In the current study we investigate whether it is possible to accelerate the development of effective teacher behavior in general. More specifically we are interested in the possibility to accelerate the more difficult and complex teacher behavior.

2. Theoretical and empirical framework

In this section we will briefly discuss the knowledge base of effective teaching that led to the construction of the observation instrument that was used in the current study (2.1). Furthermore we will elaborate on the use of data-feedback in the cyclic model of data-driven teaching that was used (2.2).

2.1. Effective teacher behavior

After more than five decades of teacher effectiveness research, scholars generally agree that effective teacher behavior is one of the important factors that eventually will lead to students' learning gains (for reviews see: Cotton, 1995; Creemers, 1994; Ellis & Worthington, 1994; Hattie, 2009; Levine & Lezotte, 1990, 1995; Marzano, 2003; Purkey & Smith, 1983; Sammons, Hillman, & Mortimore, 1995; Scheerens, 1992; Scheerens & Bosker, 1997; Walberg & Haertel, 1992). In this study we are specifically interested in the effective behavior that teachers display in their educational practice, that is teacher behavior that can be observed in everyday lessons. Based on the above mentioned research six categories of effective teacher behavior were distinguished, namely: Creating a safe and stimulating learning climate, Efficient classroom management, Clear instruction, Activating learning, Adaptation of Teaching and Teaching learning strategies (Van de Grift & Lam, 1998; Van de Grift, 2007; Van de Grift, Van den Hurk, & Houtveen, 2016; Van de Grift et al., 2011). In this section we will elaborate on the empirical evidence for the effectiveness of these categories of teacher behavior.

2.1.1. Creating a safe and stimulating learning climate

Research shows that at least part of the differences in student achievement are accounted for by factors concerning the learning climate (Cohen, McCabe, Michelli & Pickeral, 2009; Thapa, Cohen, Guffey, & Higgins-D'Alessandro, 2013). Thapa et al. (2013) distinguished three essential factors in school climate, applicable to the within-class situation: Safety, Relations and Learning and Teaching. The subject of 'safety' concerns the basic social safety in the classroom. The importance of this subject is illustrated in the results of a large scale survey on several thousands of schools in the US, which show that students consistently rate school bullying as a severe problem (Ateah & Cohen, 2009). Clarity on rules and regulations is conditional but even more important is that teachers maintain these rules and regulations and are living up to them on a day to day basis (Evertson & Weinstein, 2013). The second factor deals with the teacher-student relation which is of importance for the motivation for learning (Davis, 2003; Osterman, 2000; Perry &

Weinstein, 1998). Next to that, positive mutual relations between students can endorse cooperative learning and mutual trust and respect (Ghaith, 2003). Research in the field of the third distinguished factor of school climate, the factor of learning and teaching, shows that teachers' expectations are of major importance for student achievement (Dusek & Joseph, 1983; Harris & Rosenthal, 1985). Furthermore it becomes clear that students' self-efficacy is strongly correlated with learning motivation and student achievement (Bandura, 1997). Teachers can enhance students self-efficacy by expressing high expectations about student achievement (Teddlie, Falkowski, Stringfield, Desselle & Gervue, 1984) and by setting high but attainable learning goals (Latham & Locke, 1991).

2.1.2. Efficient classroom management

Generally accepted in education is the fact that all students can learn. The way in which they learn and the amount of time they need to do so, differs from student to student. Teachers have the important task to organize their lessons efficiently and to limit the time loss during lesson transitions, on classroom management and on maintaining order. Minimal time loss ensures optimal opportunities to learn (Creemers & Reezigt, 1996; Scheerens & Bosker, 1997). Following Carroll (1963) we differentiate between allocated time, engaged time and time on task. Although the amount of time that has to be spend on different academic subjects is formally specified (Marzano, 2007), huge differences between schools can occur in the way this allocated time is used (e.g. Houtveen & Van der Velde, 2010). The engaged time is the net amount of time used for instructional purposes. Positive correlations have been found between the amount of engaged time and student achievement (see further: Marzano, 2003; Scheerens & Bosker, 1997). Research shows that efficient teachers lose 15% less time than their lesser efficient colleagues. Furthermore they spend 50% more time on considering topic related interactions (Houtveen & Van de Grift, 2007). Time on task, sometimes indicated as 'perseverance', is the amount of time that students are actively engaged in learning tasks. Teachers are challenged to keep their students' attention focused on the learning tasks at hand.

2.1.3. Clear instruction

A clear instruction ensures that students understand the subject that is being taught and are able to combine new content with earlier acquired knowledge (Creemers, 1994; Muijs & Reynolds, 2010; Scheerens, 1992). Communicating a limited set of clearly defined lesson objectives with the students proves to be of importance (Hattie & Clinton, 2008; Smith, Baker, Hattie & Bond, 2008), as well as defining and communicating a limited set of core concepts that can work as stepping stones or advances organizers in structuring the lesson topic (Kameenui & Carnine, 1998; Lohman, 1986; Nunes & Bryant, 1996; Pearson & Fielding, 1991; Pearson & Gallagher, 1983; Pressley et al., 1992; Rosenshine & Meister, 1997). During instruction the teacher has to make sure that the students understand the subject and execute the lesson assignments as planned (Hattie & Clinton, 2008; Kameenui & Carnine, 1998; Lohman, 1986; Pearson & Fielding, 1991; Pearson & Gallagher, 1983; Rosenshine & Meister, 1997; Smith et al., 2008).

2.1.4. Activating learning

Research conducted from the sixties of the last century onwards made clear that the extent of student involvement is positively correlated with learning outcomes (Anderson, Evertson, & Brophy, 1979; Denham & Lieberman, 1980; Evertson, Anderson, Anderson, & Brophy, 1980; Fischer et al., 1980). Teachers can enhance student involvement and activate student learning by intensifying their instructions. This can be done by avoiding excessive seatwork

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