

## Data-feedback in teacher training. Using observational data to improve student teachers' reading instruction



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### ABSTRACT

We studied the improvement of the quality of student teachers' lessons in interactive (story)book reading through the use of data-feedback on observed lessons. Variables regarding the optimal time use, the quality of instruction and the student teachers' pedagogical relation with pupils were included in a one group pre-test post-test design. The student teachers were able to improve the quality of their lessons on four of the five variables within a period of five weeks. The application of data-feedback is a promising activity in the training of student teachers. Further research is needed to see whether the same results can be obtained in other topic areas of reading and to draw vast conclusions on the effects of the application of data-feedback.

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### Introduction

There is an increasing concern among policymakers in the Netherlands about pupils' reading achievements. The results from recent PISA-studies show that the achievements of 9 and 15 year-old pupils in reading remain in the highest regions (Mullis, Martin, Foy, & Drucker, 2012; OECD, 2011). Nevertheless, analyses of the results from the PIRLS- and PISA studies confirm that reading achievement scores in the Netherlands show a downward tendency (Van der Steeg, Vermeer, & Lanser, 2011). Considering the latter it is not surprising that the policy of the ministry of Education, Culture and Science is focused on increasing pupil achievement in reading.

Meta-analyses of the efficacy of the educational system show that policies effecting the primary processes of learning and instruction are most successful (Hattie, 2009). The quality of the teaching staff and, more specifically, the quality of instruction, seems to be an important factor in this process of increasing levels of pupil achievement (OECD, 2011). Therefore, it is obvious that the quality of teacher training institutions is placed high on the national policy agenda. In the recent past, several arrangements

have been made to improve the quality of teacher training institutions in the Netherlands. Attempts to develop uniform standards for the teaching profession led to a set of teacher competences and their requirements, anchored by the government in the Education Professions Act (OC&W, 2011). An important next step was made by recording teachers' knowledge base on language and mathematics in clear standards to be assessed by central exams (Van derLeeuw, Israel, Pauw, & Schaufeli, 2009). Only recently the focus on quality improvement was underlined in a management agreement between the Dutch Ministry of Education, Culture and Science, and the National Council for Primary Education. This agreement puts strong emphasis on the implementation of data-driven decision making and on the on-going professionalization of teaching staff in this matter (OC&W, 2012).

### Theoretical and empirical framework

Putting the aforementioned policies into the practice of a teacher training college asks for close consideration of theoretical and empirical evidence in the field of data-use for professional development. Furthermore, studies on teacher effectiveness can elucidate part of the content on which data feedback is based. Since this study only involved first year students, the focus on reading is limited to the theoretical and empirical background of interactive storybook reading, which happens to be the topic area allocated in the first year teacher training curriculum.

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### Adopting a theoretical model for data-feedback

The assumption that collecting, analysing and examining data will enable individuals to make informed decisions regarding their instructional behaviour led to the adoption of a cyclic model for data-driven decision making (Mandinach, Honey, & Light, 2006).

In the first step of this model, depicted in Fig. 1, data are collected and made available to the data-users. At this stage of the model the gathered data do not have any meaning in itself and their mere presence does not ensure that they are being used. In the second step of the model, the data are related to the specific context in which they were gathered. In other words, the data are used to organize and comprehend the environment. The activities that data-users perform in this phase transform the available data into meaningful information. Implications for future action are secured in the third step in which meaningful information develops into actionable knowledge. This transformation takes place when data-users select the information they regard as useful and when they weigh alternatives for future behaviour. In the next step the alternative behaviour is demonstrated (4), thus leading to outcomes (5) that are again subject for further data collection. This iterative process provides a logical sequence from changing raw data into useable knowledge, and thereby serves as an important instrument in professional development.

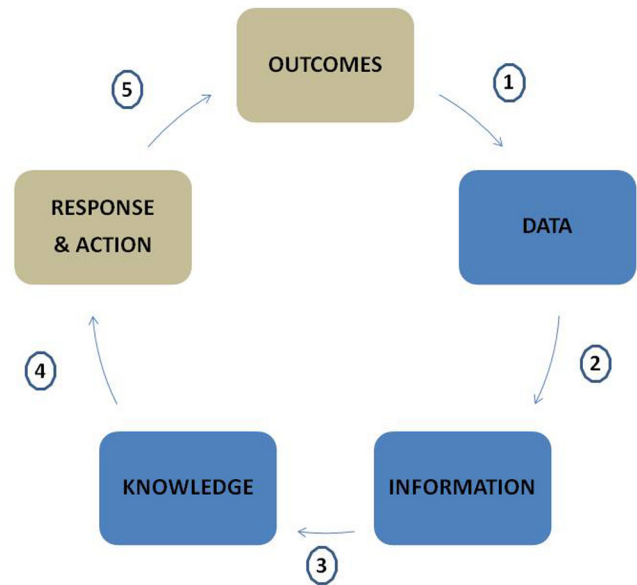


Fig. 1. Conceptual framework for data-driven decision making. Adapted from Mandinach et al. (2006).

### Teacher effectiveness

Studies on teacher effectiveness can elucidate part of the content upon which data feedback is based. Among other dimensions effective teacher behaviour is characterized by systematic and explicit instruction, the optimal use of the available time and teacher's pedagogical behaviour. This section elaborates on each of these aspects of effective teacher behaviour.

### Systematic and explicit instruction

The instruction model for which the most empirical evidence is available is the model of direct instruction. In the literature a distinction is made between a model for executive acting and a model for strategic acting (Rosenshine & Edmonds, 1990; Rosenshine & Meister, 1997; Rosenshine, 1986; Veenman, 1992). The latter model is more appropriate for learning tasks with a more complex structure in which skills cannot be learned by practicing successive procedural steps. The model of strategic acting is focused on the learning of implicit skills or higher level cognitive strategies (Rosenshine & Edmonds, 1990; Rosenshine & Meister, 1997). An example of such a learning task is learning strategies for comprehensive reading.

In both models the use of scaffolds is of major importance. This scaffolding is closely related to Vygotsky's concept of 'proximal development' (Vygotski, 1978). The applied scaffolds enable pupils to solve problems that would have been unsolvable without the supplied support. A scaffold is a temporarily adapted structure, tailor-made to suit the circumstances (Brophy, 2010). By introducing scaffolds the teacher reduces the complexity of the situation, sets a structure, clarifies the problem, points the child towards the next step in solving the problem, monitors the goals that have been set, involves pupils in completing a joint task, defines a framework and supplies rules pupils gradually can take over (Houtveen, Brokamp, & Smits, 2012).

The skill of listening can be compared with comprehensive reading. Since this skill cannot be taught in small successive steps, the model of strategic acting or strategic instruction is most appropriate. The teacher provides support by explaining the difficult words essential for the understanding of the specific story. The most important scaffold in interactive book reading is the

teachers' modelling behaviour. In this modelling behaviour teachers demonstrate their problem-solving strategies by thinking aloud, for instance about the sequel to the story. Furthermore, the teacher acts as a model for how fluent reading is supposed to sound by reading aloud enthralingly. Last but not least, the teacher serves as a model by being a person who is enjoying the story he is reading; in other words, the teacher demonstrates reading pleasure (Houtveen et al., 2012).

### The optimal use of the time available

An important aspect of effective teacher behaviour is the optimal use of the time available. This means that the allocated time preferably should be spent on the target activity of interactive book reading. As little as possible lesson time should be lost in classroom management and activities regarding the regulation of pupil behaviour. Research has indicated that the amount of time spent on instruction shows high correlations with reading achievement (Piasta & Wagner, 2010). There are, however, some limitations to the length of allocated time. Depending on children's age, effective reading lessons last 40–45 min at most, the time for independent practice included. Besides a maximum amount of time that can be allocated, the time spent on different phases of the direct instruction model should be balanced. When activities in separate phases take too much time pupils will lose their attention (Houtveen et al., 2012).

### Teachers' pedagogical behaviour

The starting point in interactive book reading is that every pupil, including those at risk, can gain positive learning experiences. This starting point is based on the assumption that success in learning in school will lead to the development of feelings of competence in pupils. Additionally, it is posited that these feelings of competence will lead to the development of self-confidence and self-efficacy (Houtveen & Booij, 1994). Research has shown that particularly pupils at risk experience problems in monitoring their learning progress and in guiding their learning process. As a consequence these pupils tend to attribute their success-experiences externally. These external attributions in turn will lead to poorly developed feelings of self-efficacy and personal control. It is possible that the aforementioned will lead to attention problems and problems with work attitude. In turn these problems can lead

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