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Picturing student progress : teachers' comprehension of curriculum-based measurement progress graphs

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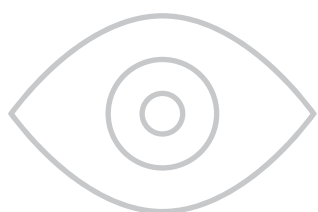
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GENERAL INTRODUCTION



CHAPTER 1

GENERAL INTRODUCTION

This dissertation focuses on teachers' comprehension of student progress graphs from a progress-monitoring system called curriculum-based measurement (CBM). In Dutch, CBM is referred to as "continue voortgangsonderzoek" (CVM). CBM is a system designed for teachers to use to track the progress of students with learning difficulties and to evaluate the effectiveness of instruction for those students (Deno, 1985, 2003). CBM involves frequent administration (1-2 times weekly) of brief measures (1-3 min) that sample student performance in an academic area such as reading. The scores on these measures are placed on graphs that display student progress over time. The CBM progress graphs display baseline data for the student and peers, a long-range goal representing the desired level of performance at the end of the school year, a goal line that extends from the baseline to the long-range goal, data points representing the student's scores on CBM measures, and slope lines representing the student's growth or progress within various instructional phases (see Figure 1.1, for a sample graph).

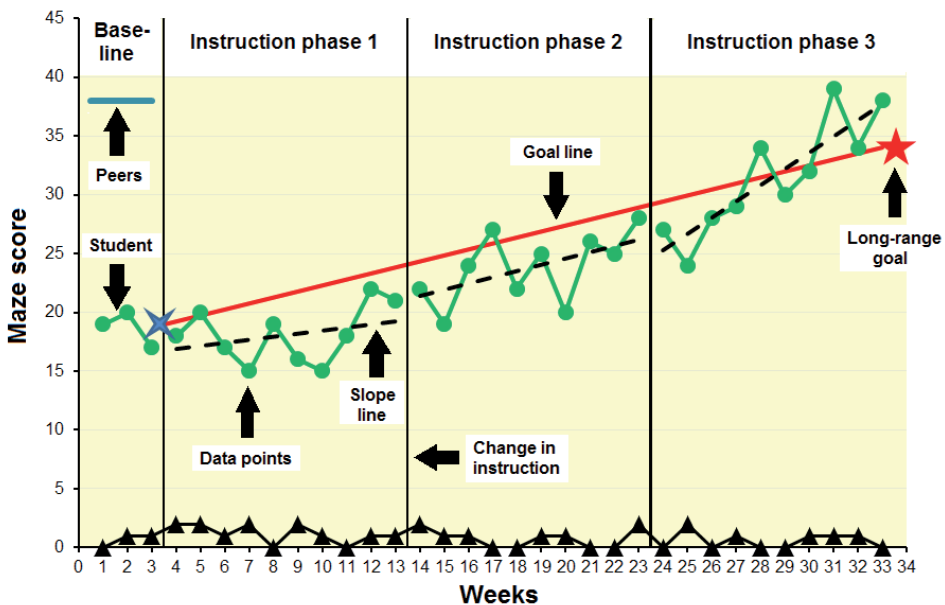


Figure 1.1. Sample of a CBM progress graph. For illustrative purposes, labels and arrows are depicted on this sample graph.

When implementing CBM, teachers inspect the progress graphs frequently to judge whether the instructional program is effective for the student and use the data to make instructional decisions. Thus, if the student's progress is less than expected – that is, if the slope line is less steep than and/or is below the goal line (see Figure 1.1, instruction phase 1 and 2) – the teacher changes the instruction. If the student's progress is greater than expected – that is, if the slope line is steeper than and above the goal line (see Figure 1.1, instruction phase 3) – the teacher raises the long-range goal. The teacher then continues to monitor the student's progress to determine the effect of the change. This cycle of “instruct – evaluate – change instruction or raise goal – evaluate” is used to systematically build effective educational programs for students with learning difficulties.

Research on CBM demonstrates that (1) *when* teachers use CBM to monitor student progress *and* respond to the data with instructional and goal changes, student performance improves, but that (2) teachers often do not respond to the data (see Stecker, Fuchs, & Fuchs, 2005, for a review); that is, teachers often collect the data but do *not* make instructional decisions based on the data. Teachers' non-use of the data for instructional decision-making is not unique to CBM, but has been noted in other formative assessment systems as well (e.g., Black & Wiliam, 2005; Mandinach, 2012), suggesting that data-based decision-making is challenging for teachers. Yet, within CBM, little research has been done to explore the reasons for teachers' non-use of the data for instructional decision-making.

There are likely multiple reasons for teachers' non-use of CBM data, for example, teachers may not know how or what to change in their instructional programs (Stecker et al., 2005) or they may not believe that CBM data reflect student progress (Foegen, Espin, Allinder, & Markell, 2001). However, one potential reason that has received little to no consideration in the CBM literature is teachers' ability to understand, read, and interpret – in other words to “comprehend” – the CBM progress graphs. If teachers do not accurately read and interpret the CBM progress graphs, they will not respond to the data with instructional changes when necessary. This dissertation examines teachers' ability to read and interpret – to comprehend – CBM progress graphs.

Outline of the Dissertation

The research presented in this dissertation had two specific goals. The first was to deepen and extend our knowledge about teachers' comprehension of CBM progress graphs and the second was to examine methods for improving teachers' comprehension of CBM progress graphs. The dissertation includes six chapters (including this general introduction). **Chapter 2** illustrates how CBM can be used within educational settings, provides an overview of the research on CBM, and outlines the challenges associated

with the use of CBM for data-based decision-making. Although CBM is widely known in the United States, it is relatively new in the Netherlands. Chapter 2 provides the background information necessary to understand the studies in the subsequent chapters.

In Chapters 3 and 4, the focus turns to teachers' comprehension of CBM progress graphs. Using think-aloud and eye-tracking methodologies, we examined how teachers described (**Chapter 3**) and visually inspected (**Chapter 4**) CBM progress graphs. In **Chapter 5**, the focus shifts to examining methods for improving teachers' CBM graph comprehension. Via a randomized control study, we compared the effectiveness of three instructional approaches for improving teachers' CBM graph comprehension. In the final chapter, **Chapter 6**, the main findings of the studies described in chapters 3, 4, and 5 are summarized, integrated and discussed, and, then, limitations of the research and suggestions for future studies as well as implications for practice are provided.

