

## Chapter 15

# Measure It, Monitor It: Tools for Monitoring Implementation of Text-to-Speech Software

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### ABSTRACT

*This chapter addresses the importance of systematic assessment using a variety of tools to evaluate implementation and monitor the outcomes of assistive technology innovations. A variety of the tools and strategies—developed to monitor implementation and change, gather perceptual data, and collect academic outcome data—are discussed. These tools and strategies were developed and tested in the 2005-2006 and 2006-2007 Iowa Text Reader Studies. Applications of the tools are featured for various stakeholders, such as teachers, administrators, and researchers. Multiple research designs to determine the impact of assistive technology, including the Time Sequence Concurrent Differential Model, are contrasted.*

### INTRODUCTION

The intent of this chapter is to share a variety of the tools and strategies developed to monitor implementation, gather perceptual data, and collect outcome data. These tools were tested in the 2005-2006 and 2006-2007 Iowa Text Reader Studies (Dimmitt, Hodapp, Judas, Munn, & Rachow, 2006; Hodapp, Rachow, Judas, Munn, & Dimmitt, 2007; Rachow & Hodapp, 2008). These tools focused on providing a convergence of data that are sensitive to change

from multiple sources and multiple stakeholders by triangulating the data. Instruments addressed include: implementation tools for text-to-speech software, both specific and universal; data analysis tools for individuals and groups; research models; innovative survey strategies; and rubrics for text-to-speech teacher portfolio artifacts.

### BACKGROUND

With the passage of the Education of All Handicapped Children Act (P.L. 94-142) in 1975, the focus

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and mandate for improving academic achievement for students with special needs have increasingly narrowed and become high stakes concerns for school districts. Initially, concerns were focused on providing student access to the general education curriculum. Now, the emphasis has moved to student outcomes documenting closure of the achievement gap between students with special needs and their typical peers by providing this cognitive access to the general education curriculum (Abell, Bauder, & Simmons, 2005; Hitchcock, Meyer, Rose, & Jackson, 2007). The inclusion, for the first time ever, of special education student achievement within the accountability of the No Child Left Behind (NCLB) Act of 2001 raised the level of concern for student proficiency from the individual to the systems level.

Since the mandate of Individuals with Disabilities Education Act (IDEA) of 1994, and despite the requirement of NCLB to utilize research-based strategies, only limited research has been conducted in the fourteen years on the effectiveness of assistive technology (AT) to improve student achievement regardless of instructional area (Edyburn, 2003, 2007). DeRuyter (1994, 1997) attributed the paucity of research to lack of both subjective and objective measurement tools to support or deny the effectiveness of AT. Gersten and Edyburn (2007) attributed the overdependence of consumer satisfaction surveys to the lack of validated outcome measures. Numerous researchers have commented that more attention was paid to the device selection than implementation and outcome measurement (Bausch & Ault, 2008; Edyburn, 2008; Parette, Peterson-Karlan, Wojcik, & Bardi, 2007). Edyburn (2003) defined ten variables, such as change in function, change in participation, goal achievement and usage associated with AT use that could be indicators to help understand the outcomes. Indeed, it is only recently that the concept of an implementation plan including tools for measuring outcomes has been introduced into the literature (Bausch &

Ault, 2008; Edyburn, Fennema-Jansen, Harihan, & Smith, 2005; Malouf & Hauser, 2005).

### **Innovative Tools to Monitor Implementation of Text-to-Speech Software**

DeRuyter (1997) called for more accountability as well as development of performance and quality monitoring tools to prove the value and impact of AT. Edyburn (2008) delineated six variables that should be measured as part of an AT outcome measurement system. The variables included student performance, consumer satisfaction, quality of life, cost, goal achievement, and change in participation. Without an understanding of the level of implementation of an intervention, Silverman, Stratman, and Smith (2000) feel it is impossible to accurately measure the impact of an innovation. To measure implementation, including affective and behavioral dimensions of change in response to text-to-speech intervention, the Iowa Text Reader Studies designed several instruments based on the Concerns Based Adoption Model (CBAM) (Hord, Rutherford, Austin, & Hall, 1987). The Concerns Based Adoption Model was selected based on its reputation as a widely recognized and validated model for monitoring teachers' responses to changes in curriculum and instruction. Anderson (1997) conducted a literature review on CBAM, which documented the robust and empirical foundations of this theoretical model. Anderson summarized CBAM's five assumptions basic to educational change: (a) change is a process not an event, (b) change is accomplished by individuals, (c) change is a highly personal experience, (d) change involves developmental growth, and (e) change can be facilitate by interventions towards the individuals, innovations, and the context (p.333). The Iowa Text Reader Projects adapted the three primary tools CBAM developed to monitor change: Innovation Configuration, Stages of Concern Survey, and Level of Use Interview. The first tools to be discussed here are the Student

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