

Databases Can Help Teachers with Standards Implementation

by Victoria L. Bernhardt

A superintendent I know spoke for 99 percent of the school districts in America today when he told me that his district had systems to manage money down to the dime, but no systems to manage the learning mission. This is the most critical challenge for school districts to meet.

Larry Lezotte, Author, *Learning for All*

Education for the Future Initiative staff have been offering data analysis workshops throughout California and in other states for the past ten years. While we have been passionate about the impact of effectively using data for comprehensive school improvement, and while we have been able to transfer that passion to educators, we have found that school and school district personnel are still finding it difficult to produce appropriate analyses. The number one reason: teachers and administrators do not have access to databases that will enable them to analyze relevant data. We are now months away from a new millennium, and still very few schools across the country can access the data needed for school improvement analyses (i.e., student achievement data gathered and accessible electronically at the individual student level, from which summative data can be drawn and analyzed).

The Need for Databases for Standards Implementation

A school's effective use of data can enable the successful identification and implementation of appropriate strategies ultimately leading to standards attainment and student learning increases. However, many schools do not use data to

promote increased student learning or standards implementation. The reasons for this are varied. The data may not be easy to access, they may not be in forms that are easy to understand, no one may be available who is knowledgeable and can work with the data, or teachers just might not know the data exist. For some, there may be so much data that knowing where to begin the analysis is the challenge. Each of these situations (as well as many others) actively discourages schools from learning about the phenomena they are attempting to understand. By supporting the creation or access of student databases containing individual student achievement records, school leaders' efforts to create and sustain professional learning communities focused on the success of all students can be realized.

Databases

Used here, the term database refers to a system of complete, easily retrievable and organized information that is accessible electronically and easily manipulated. Telephone books, encyclopedias, and dictionaries are common databases that are organized alphabetically to make names, subjects, and words easy to find. These databases allow users to organize, store, and retrieve

information. When these databases are accessed electronically, they are even easier to search and reorganize for use. In addition to organizing, storing, and retrieving information, schools and districts need databases to manipulate and summarize information.

In a student-based database, we are trying to quantify the education-relevant life of each student. (See Figure 1). This database would identify who each student is (demographics), what each student has been experiencing with respect to what we are doing to help them learn (school processes), what they are perceiving about the learning environment (perceptions¹), and what the student knows (student learning). School personnel could look at individual student information, summarize results for all students (aggregate), and reorganize the information to understand results for different groups of students (disaggregate).

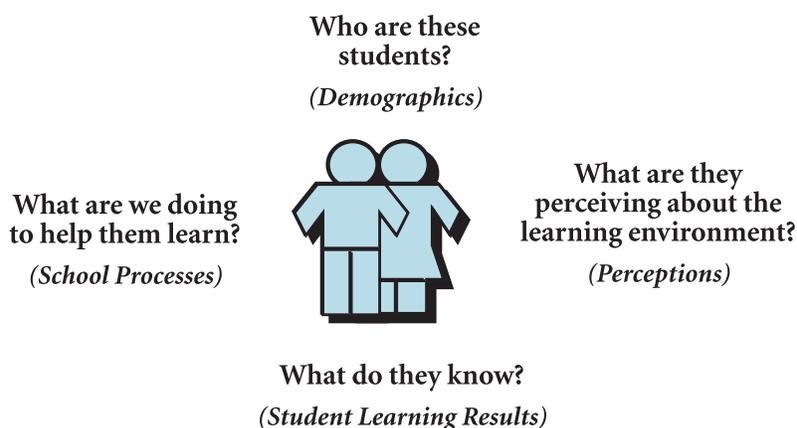
How Can Databases Help with Standards Implementation?

Without a database, teachers cannot realistically dig deep enough into the data to understand standards implementation schoolwide. With a database, they can:

- ◆ classify and cluster different data elements to understand the impact of standards implementation with respect to the results they are getting
- ◆ understand the continuum of learning being created for students
- ◆ predict scores, in order to prevent failure
- ◆ understand what needs to change to get different results
- ◆ work smarter, not harder

An example of the questions that can be answered using a database to understand standards implementation follows.

Figure 1
Student-based Database



¹A Note About Perceptions

Although perceptions are not typically a part of the student achievement database (questionnaires are often administered anonymously and, therefore, cannot be linked to the student identification number), student perceptions can be a major indicator of what needs to change to get different results. Formal questionnaire administration may not be necessary—simply talking with students can give teachers breakthroughs. For example, when third-grade teachers at one elementary school wanted to know how to get all students reading on grade level, they read with the students and asked them questions. This helped the teachers understand the issues their students needed to work on. Many times, the students hold the answers—we just do not always ask them.

Perhaps teachers want to know more about implementation of a third grade reading standard. Ultimately, they want to be able to answer the following questions:

- ◆ What processes are leading students toward meeting the standard by the end of grade three?
- ◆ Why are some students not meeting the standard by the end of grade three?
- ◆ How do student demographics impact these results?
- ◆ How does the way students are taught impact the results?
- ◆ What do we need to do differently to make sure all students meet the standard by the end of grade three?

School personnel might begin their analysis of the standard with a database of all students at the elementary school. From that database, teachers could look at how the third grade students scored overall. They might then separate the students into two clusters: those who meet or exceed the standard, and those who *do not* meet the standard. Figure 2 illustrates the example for the students who *do not* meet the third grade reading standard. A similar figure could be made for the students who meet the standard.

To find out who these students are and how their learning experiences add up to current results, one of the first things educators would want to know is the demographics of the students falling into this category as defined by gender, ethnicity, mobility, language fluency, socioeconomic status, etc. To learn more about how previous scores relate to third grade scores, each student's second grade scores, and their first grade scores could be reviewed. This breakdown could reveal more about the standard, i.e., must students meet the first grade standard at a certain level in order to meet the third grade

standard? Must students meet the second grade standard at a certain level in order to meet the third grade standard? In fact, from these breakdowns, one can see if there are students who meet the standard one year and not the other two years, or if there are students who meet the standard for two years and not one year—and determine which year might be the most important for reaching the third grade standard. Then, by looking at the characteristics of the students by previous scores, one could see if standards attainment is related to language fluency, one particular element of demographics, or perhaps the way students are taught. We really cannot know until we dig deeper.

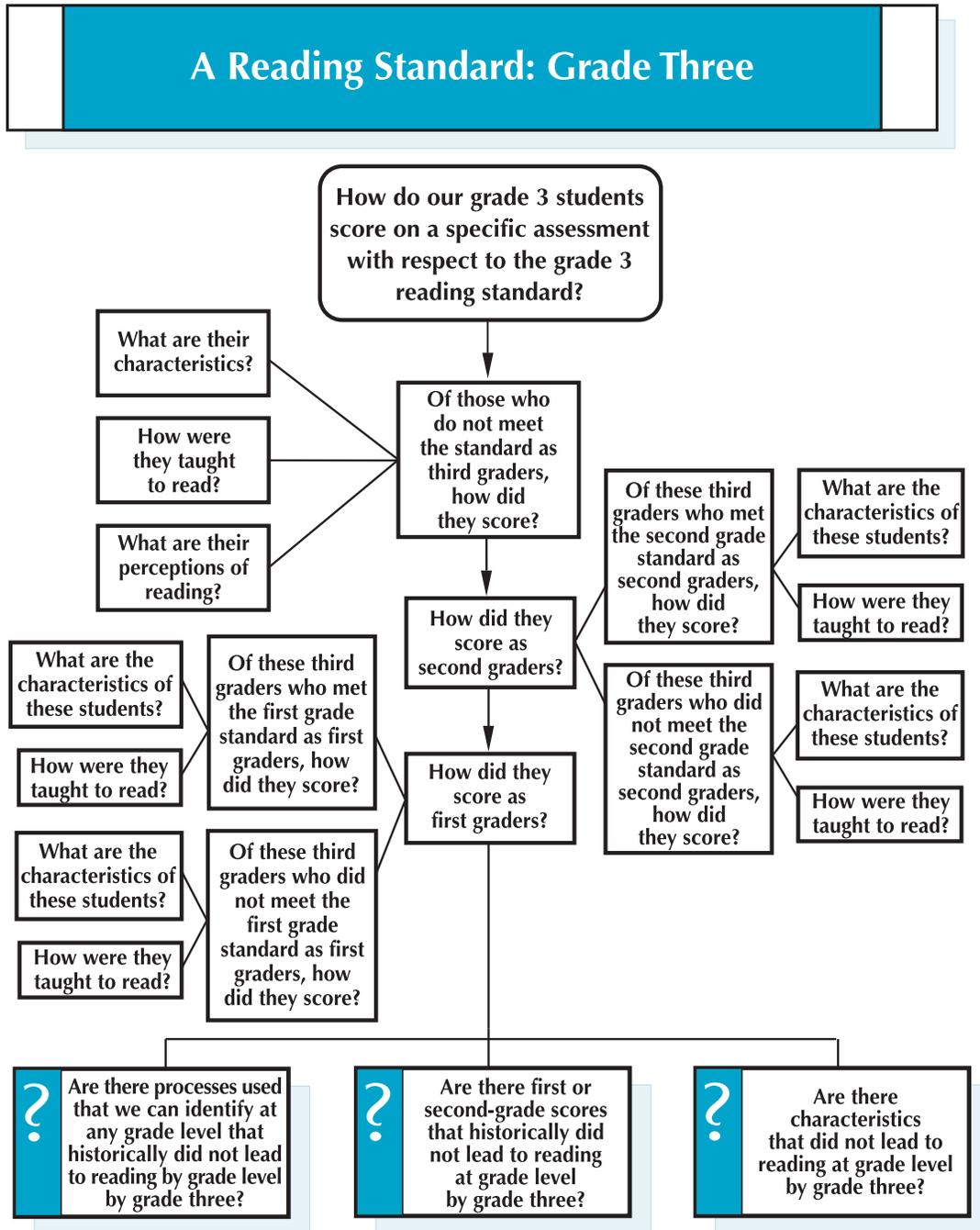
By clustering students in different ways and thinking about how they were taught to read at each grade level (school processes), teachers could become clearer about the results they are getting. Clarifying how results are achieved will also clarify how processes need to be altered to get results that would ensure the success of all students and prevent student failures.

In fact, our ultimate goal in digging deeper is to “predict” and “prevent” student failures. In other words, historical student achievement data can be used to identify factors that can help teachers know when to intervene to prevent potential failure later on. For example, teachers would want to know the answer to the following question:

For any subtest or test, are there first or second grade scores that never lead to reading on grade level by grade three?

We might find that any first grader scoring an 8 on a particular subtest historically never read on grade level by grade three. This would be extremely important information to have. In the following years, if a first grade student scored an 8 or below, teachers would want to intervene to do whatever is necessary to ensure their success.

Figure 2



How Can Databases Help with Standards Implementation in the Classroom?

Classroom teachers would benefit from having a database that would allow them to track student progress toward standards attainment throughout the year. Such a database would be supported by the teachers' attention to the processes used to help students achieve the standard. The teachers' ability to recognize processes that need to change would be supported by the information received from the data.

Figure 3 is an illustration of questions that can be answered through the use of a classroom database supporting standards implementation. At the beginning of the year, the teacher would identify the standard for the end of the year, including what it would look like when students meet the standard. Additionally, the teacher would start the year with historical assessment information on each student in her classroom. At multiple times during the year, student progress related to the standard would be

Figure 3
A Third-Grade Reading Standard:
Use Knowledge of Complex Word Families
to Decode Unfamiliar Words

	Pre-Assessment	October Assessment	January Assessment	March Assessment	Post-Assessment
Processes Used	→				
Students on target to goal	Who are they?	Who are they?	Who are they?	Who are they?	
What do the students know?	Who are they?	Who are they?	Who are they?	Who are they?	Goal: Students reading at grade level by the end of grade three.
Students needing additional support	What concepts do they not understand?				
	What skills do they need?				
Processes Used	Processes altered	Processes altered	Processes altered	Processes altered	

assessed. At each assessment, the teacher would be able to see who is not making progress toward meeting the standard, to understand if the students not meeting the standard are having difficulty with similar or different concepts, and to intervene with different methods of instruction for those students.

A Note about Processes

It is unfortunate that teachers and administrators do not regularly map their school or classroom processes, or think about processes in relationship to data analyses or the results they are getting. It has been clearly demonstrated that when schools do map their school processes, they change them immediately because they can see what needs to change.

Understanding processes (instructional strategies) is important because if we want different results, we must change the processes that create the results. We cannot continue to do the same things over and over and expect different results.

With respect to reading processes, we often find that schools will assess their students informally and then place the bottom 20 percent in individualized instruction. (See Figure 4.) When teachers review their processes in comparison with the results they are getting, they get their “ah-hahs” about what needs to change. Starting with the standard, teachers can see that the number of students not meeting the standard is often more than 20 percent. The process identified in Figure 4 would then be incongruent with the needs of the students. While the flow of Figure 5 does not look that much different, starting with the standard would enable teachers to know exactly how many students did not meet the standard. With the use of a database, teachers could easily see who is not meeting the standard and what concepts or skills are not being achieved.

While the flowchart varies only slightly when the standard is used to determine instructional processes, most likely a greater percentage of the

population would require different instructional processes to meet the standard. When more than 20 percent do not meet the standard, a new approach to teaching reading must be considered for the classroom.

Figure 4
Typical Process Flowchart

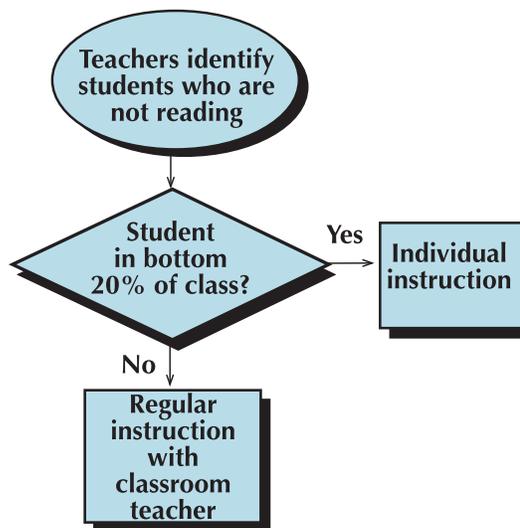
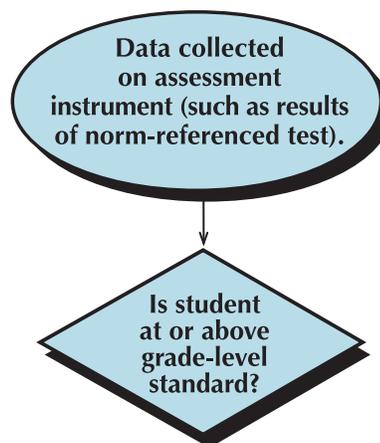


Figure 5
Process Flowchart with Standard



Summary

Without the measurement and monitoring of progress using databases, the effectiveness of the work of many districts, schools, and teachers may never be known. Without databases, schools may never know that redirection of their resources could have made a world of difference to a number of students' options in life. Without a database, teachers are hindered from sharing student information with the teacher their students are placed with next. Without a database, student success is left to chance and perception.

We are at the same point with student achievement databases that we were half a decade ago with technology in schools. We will eventually need to gulp twice and hire appropriate personnel to support our database work, much like we had to hire technology specialists to help us set up and maintain our computers and networks.

You will be able to read more about databases for school improvement when *Designing and Using Databases for School Improvement* is published in Summer 1999. This book describes, in layperson's terms, how to think through the building of a database that will result in desired analyses leading to schoolwide improvement. It focuses on designing and maintaining a database, as well as translating data into useful forms at all levels of the school.

About the Author

Victoria L. Bernhardt, Ph.D., is Executive Director of the *Education for the Future Initiative*, a not-for-profit organization whose mission is to build the capacity of all learning organizations at all levels to gather, analyze, and use data to continuously improve learning for all students. She is also a Professor (currently on leave) in the College of Communication and Education, at California State University, Chico. Dr. Bernhardt is the author, or co-author, of numerous books, including:

- ▼ *Data Analysis for Continuous School Improvement*, Third Edition, provides an updated continuous school improvement framework, explains the components and structures for using schoolwide data for the purpose of continuous school improvement, and organizes the information for easy retrieval and application.
- ▼ *Response to Intervention (RtI) and Continuous School Improvement (CSI): Using Data, Vision, and Leadership to Design, Implement, and Evaluate a Schoolwide Prevention System* (2011) (with Connie L. Hébert) describes how to get all staff working together to design, implement, and evaluate a schoolwide prevention system, and shows specific examples of how to do this.
- ▼ *From Questions to Actions: Using Questionnaire Data for Continuous School Improvement* (2009) (with Bradley J. Geise) describes how to create, administer, analyze, and use questionnaires as a tool to improve teaching strategies, programs, and learning organizations.
- ▼ *Data, Data Everywhere: Bringing All the Data Together for Continuous School Improvement* (2009) is an easy-to-read primer that is conversational and accessible. This newest book will help your faculty and staff become comfortable with using data to drive a continuous school improvement process.
- ▼ *Translating Data into Information to Improve Teaching and Learning* (2007) helps educators think through the selection of meaningful data elements and effective data tools and strengthens their understanding of how to increase the quality of data and data reports at each educational level.
- ▼ A four-book collection of using data to improve student learning—*Using Data to Improve Student Learning in Elementary Schools* (2003); *Using Data to Improve Student Learning in Middle Schools* (2004); *Using Data to Improve Student Learning in High Schools* (2005); and *Using Data to Improve Student Learning in School Districts* (2006). Each book shows real analyses focused on one education organizational level and provides templates on an accompanying CD-Rom for leaders to use for gathering, graphing, and analyzing data in their own learning organizations.
- ▼ *Data Analysis for Continuous School Improvement* (First Edition, 1998; Second Edition, 2004) helps learning organizations use data to determine where they are, where they want to be, and how to get there—sensibly, painlessly, and effectively.
- ▼ *The School Portfolio Toolkit: A Planning, Implementation, and Evaluation Guide for Continuous School Improvement*, and CD-Rom (2002), is a compilation of over 500 examples, suggestions, activities, tools, strategies, and templates for producing school portfolios that will lead to continuous school improvement.
- ▼ *The School Portfolio: A Comprehensive Framework for School Improvement* (First Edition, 1994; Second Edition, 1999). This first book by the author assists schools with clarifying the purpose and vision of their learning organizations as they develop their school portfolios.

Dr. Bernhardt is passionate about her mission of helping all educators continuously improve student learning in their classrooms, their schools, their districts, and states by gathering, analyzing, and using actual data—as opposed to using hunches and “gut-level” feelings. She has made numerous presentations at professional meetings and conducts workshops on the school portfolio, data analysis, data warehousing, and school improvement at local, state, regional, national, and international levels.

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