Technology, and the Promotion of Progress in Education

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With a slight variation on the wording of the theme of this issue, "Technology, and the Promise of Progress in Education" this paper seeks to explain how one school board uses technology to promote progress in education, and then describes how this process had a profound impact on teachers' and principals' views of their own teaching practices. In this case, technology is indeed a promise of progress because computer-based progress monitoring was used to ensure that student needs were met.

COLLECTING DATA ON READING

During the 2009-2010 school year the Thunder Bay Catholic District School Board implemented a new progress-monitoring database that was used to track the growth of students in reading in Grades 1 to 3 (n = 1407). The purpose of this method was to provide teachers with a graphical representation of weekly progress towards goals that were individually established for all students. Grade level teachers, special educators, and the principal would meet monthly and use student-level data to make instructional decisions for at-risk students. Not a single student went unnoticed, and student reading growth was significant.

The process, although new to this board, was easy to implement, and involved four steps: (1) Teachers used Curriculum-Based Measurement (CBM: Deno, 1985) reading tests to screen all students during the first week of school. CBM are one-minute timed reading tasks that measure the accuracy and speed of students' reading. Reading fluency has been shown to be an excellent indicator of a reading ability (Wolf, 2007); (2) Students scoring below cut-scores established through previous research (e.g. Fuchs, Fuchs, Hamlett, Walz, & Germann, 1993) were deemed potentially at-risk for reading failure. For these students, year-end reading goals were established by multiplying the number of weeks left in the year (say, 35) by the rate of growth expected (1.5 new words per week for a Grade 1 student) in order to close the gap with typically achieving peers. Then, the student's goal total was entered into a new computer database, along with their baseline score, and the computer automatically displayed a goal line for the teacher to see (Figure 1); (3) At-risk students received weekly CBM and the scores were entered into the system; and (4) For students who continued to score below the goal line (at least 4 weeks in a row), teachers planned more intensive instruction. Increasing instructional intensity could take various forms, including but not limited to being more explicit in instruction, providing more opportunity for practice and corrective feedback, or providing instruction in one on one, or small group settings more frequently.

DISPLAYING PROGRESS

Figure 1 provides an example of how the data were displayed for In-School Teams. If a student did not make adequate progress after 4 weeks (shown by the arrow in Figure 1) the team made an instructional change, and recorded their decision in the form of meeting minutes on an In-School Team meeting template. The meeting minutes provided teachers a written record of what worked for students, and what did not work. Although the student's progress shown is still under the goal line in the 4 weeks following the initial instructional change, the slope of progress is excellent, so the intervention would continue without further alterations.

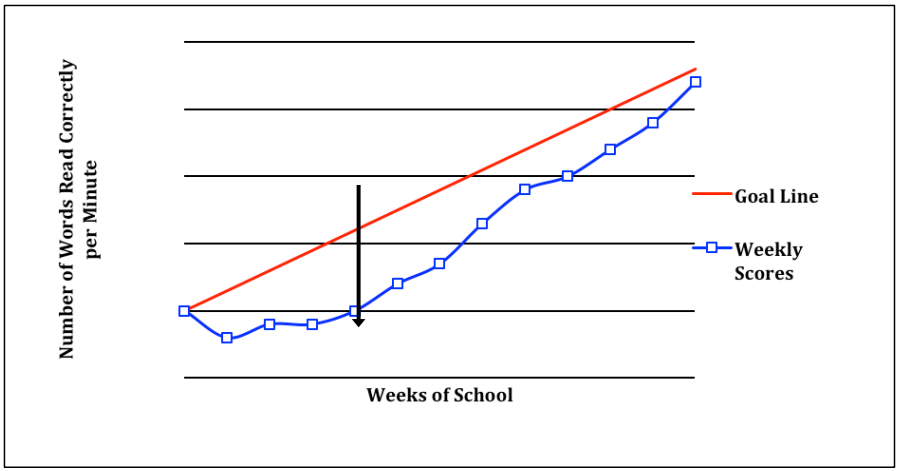

Figure 1. Weekly progress monitoring scores. The goal line is set at a slope of 1.5 words per week and displayed on each graph.

HOW THE USE OF TECHNOLOGY AFFECTED TEACHERS

A series of focus groups at the end of the school year revealed many interesting findings regarding teachers' impressions of charting student progress in a visual way. A few teachers wanted to show the graphs to parents to demonstrate growth their child was making. Some teachers used these graphs to motivate students. Teachers reported that children enjoyed seeing the progress they were making, and the graphs even served to foster motivation toward learning to read well.

The progress monitoring graphs also motivated teachers (see Hasbrouck, Woldbeck, Ihnot, & Parker, 1999 for more on this). Several teachers reported that the display of student growth encouraged them, and helped them feel a sense of accomplishment as they saw their students make progress. Others reported that lack of growth in some students motivated them to search for something else that might work, and several reported that the data helped them work more closely as a team to

find solutions. Teachers were able to see if an intervention of interest was effective or not, and could say with some degree of certainty whether or not it was wise to continue to use it. Others had their professional judgment validated when an at-risk student's growth curve increased sharply due to an intervention they believed to be effective. The data was a means of ensuring that students received appropriate interventions.

CONCLUSION

I believe the ease at which the data could be recorded and displayed had a lot to do with the teachers' willingness to collect it, display it, and eventually use it for decision-making purposes. Technology made the process "easy" and freed teachers up to spend their efforts on the important business of thinking about how to teach. Teachers reported that it was easy to enter data, display it, and read it for decision-making purposes. What's equally important is that the board database was designed in such a way that all CBM spreadsheets could be displayed in Excel format, which made the data easy to analyze with statistical software. Finally, the type of progress monitoring technology used in this board, albeit quite simplistic by today's standard, provides teachers with a graphic representation of their daily effectiveness with most students, and helps them determine whether instructional changes may be required for others.

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