All Aboard! Final Destination…Student Success

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The Nipissing-Parry Sound Catholic District School Board's CODE Special Education Project: Communication For All has been like planning a long-anticipated journey. In preparing for our project journey, we needed to determine and calculate where we were going, what preparations needed to be done and what stops we were going to make along the way. Preparedness and readiness for the unexpected were essential packing items. Looking back, our target group included students at the junior level in three area schools who were identified with learning disabilities.

And so our journey began...

The instructional leadership of the principals involved was paramount to the success of the project in its early stages. As evidenced in the research, "*Instructional leadership is demonstrated when principals and staff focus their time on the teaching-learning process (not just administrative duties) and work together to bring about growth in student achievement. Their commitment is to learning and working with others — teachers, students, parents and community members — in order to improve the quality of instruction in their schools*" (The School Effectiveness Framework, p. 32, September 2008).

Our main focus was to enhance communication skills in literacy and, through the use of assistive technology, to support learning in the regular classroom using the elements of universal design as the foundation so that all students would benefit.

As our journey continued, student baselines were established in reading and writing. Individual student profiles were compiled and assessments were administered at regular intervals throughout the year. Existing data, both formative and summative, were collected. In analyzing the school's data, it was imperative to provide classroom teachers with professional development opportunities to base instructional decision making on evidence-based practices.

> *"Research can provide teachers with a road map that highlights effective teaching techniques for all students"* (Education for All, P.259).

Multi-tiered professional development opportunities were provided for the following educational roles: project principals, classroom resource teachers, classroom teachers, parents and students. Three key outcomes gleaned from these opportunities included educators, parents and students becoming familiar with Kurzweil and AlphaSmart technology and their application to classroom instruction; the use of differentiated strategies; deeper understanding of the range of learning styles in the classroom; and the power of students advocating for their learning needs.

First Stop! St. Alexander School, 2005–2006

Cultivating a collaborative professional learning team that focused on continuous improvement for all students, exercising precision, differentiation and intentionality in assessment and instructional practices, married with the belief that all children can learn, proved to be key elements in improving the achievement of students with special needs at St. Alexander Catholic School.

The road to improving student achievement can seem bumpy, winding and foggy without a road map for guidance. Meeting the needs of the 42 Grade 3 to 6 students with identified needs had become a challenge. The principal and teachers began to use the principles of the Universal Design model as their primary guide on this journey. During the first year of the CODE: Communication For All project, Kurzweil programs were introduced to students, five Grade 3–6 classroom teachers, two classroom resource teachers, educational assistants, and parents through a lab-type setting.

In addition to establishing student reading and writing baselines, teachers and the principal worked together to form individual student baselines with and without the use of assistive technology. Teacher moderation of student samples of writing to inform next steps for instruction was key to this first leg of the journey. One of the major findings from the inquiry-based project is the need to ensure that the assistive technology matches the specific need of the student. Just as one person's prescription eyeglasses would not suit another, the staff found that for every student, it is important to identify curriculum objectives and the tasks for each student, and to match the characteristics of the assistive technology with the student's individual learning profile (Education for All, p. 130, 2005).

Within a short amount of time, teachers reported that student motivation levels had increased and frustration over content decreased. As stated by Rhonda D'Agostino, a Grade 4/5 teacher involved in the project, "*Students have been successful in providing their analysis and thoughts across the curriculum through a science and social studies focus. They are no longer frustrated by the content.*"

In the Grade 3 classroom, where 16 of 26 students were identified as having special needs, the Kurzweil program was integrated as a literacy centre as well, enhancing comprehension and topic development. Students with special needs were more readily able to access the curriculum, which increased independence in learning and removed many barriers to enable them to reach their full potential.

Upon reflection, one of the essential learnings throughout this journey is that the infusion of technology alone does not improve student outcomes or close the achievement gap for students with special needs. However, assistive technology connected to focused instruction, sound assessment practices, a professional learning team that uses student data to inform next steps, and a high degree of instructional leadership certainly does!

Students On The Move – Students With Special Needs, 2005–2006 Results

	Number of Grade 3 Students With Special Needs: 16		
	Reading	**Writing**	**Mathematics**
At Provincial Standard and Above	69%	62%	88%
Provincial Standard	21%	18%	31%
In all areas of the assessment, no students with special needs achieved a Level 1.			

In 2006–2007, the project maintained a focus on junior and intermediate students with learning disabilities. The focus included two overarching goals: improving both the achievement of students with special education needs and instructional practice. It became evident that assistive technology integrated into the classroom through Kurzweil and AlphaSmart programs increased the level of student comfort with technology, as well as being instrumental in assisting students to access the curriculum at their true achievement level.

Engaging parents was an important aspect of this quest. Parent meetings were conducted for all schools involved and included:

- An overview of the project and definition of a learning disability by a psychologist.
- Strategies to help students at home.
- Demonstration of Kurzweil and AlphaSmart technology.
- Short presentation by a student involved in the project.

As a result, parents felt more connected as a community. Parents were able to increase their knowledge of learning disabilities and of how to address the needs and frustrations of their children.

The 2007–2008 Journey Year…

Continuing on our journey, the 2007–2008 Special Education project continued to focus on the implementation of effective capacity building and instructional practices to improve achievement of students with special education needs identified through the first two years of the CODE project. The project continued to focus on junior/intermediate students with learning disabilities and their use of assistive technology. With the guidance of a Learning Disabilities Consultant (a shared service with our co-terminous school board), student profiles were examined and maintained, generating better information and data and a more thorough understanding of student assessments. Determining the strengths and needs of students helped in the development and maintenance of connections between the IEP and the Provincial Report Card. Linkage was established through the CODE Special Education Project and the Ontario Psychological Association Project.

Next Stop: A Teacher's Perspective – Introduction of Smart Board Technology

During the 2007–2008 school year, Smart Board technology was piloted in our CODE classrooms. The following is a testimonial from Melanie Courchesne, a Grade 3/4 teacher involved in the project, on the impact that assistive technology has had on her class and her teaching.

"The Smart Board allowed me to address a variety of learning styles simultaneously. In particular, struggling students, and those who were very active, benefited from the opportunity to physically manipulate words, numbers and images. I was able to use online manipulatives to demonstrate concepts. Then, the students could access these same manipulatives to do their work, using the laptops. This was highly helpful and motivating for my reluctant learners. The most dramatic difference that occurred as a result of this technology was in writing. I taught my students to use Co-Writer in conjunction with Write Outloud on the laptops. This technology levelled the playing field for my struggling students. They were able to get their ideas down without constant one-to-one support for spelling and rereading. As a result, I became a much more effective teacher. In the past, writing sessions were spent trying to meet the needs of many frustrated students who couldn't spell or read enough to write independently. I felt like I was dealing with a leaky dam, running from one raised hand to another, plugging holes in futility. With this new technology, my students became willing and able authors. I was able to spend my time coaching small groups of students, zeroing in on specific areas of need. The improvement in all of my students was phenomenal. I feel that this technology brings us to a whole new level of teaching!"

> *"Learning is not workshops and courses and strategic retreats. It is not school improvement plans or individual leadership development. These are inputs. Rather, learning is developing the organization, day after day, within the culture."*
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> *(Michael Fullan, pg. 28, 2008)*

Next Stop: Noteworthy Successes!

- Monthly updates to Board of Trustees, Principals, SEAC members — everyone felt connected to the project
- Increased student reading levels
- Increased student advocacy
- Increased understanding of how children learn
- Increased evidence of differentiated instruction
- Increased evidence of student achievement

« All Aboard, continued

Final Destination: Student Success…Right On Time!

It is often said that the journey is not about the destination alone, but is more about the learning that occurs along the way. We would have to agree. However, in this case, the perspective of one of our Grade 6 students involved in the project on how the Kurzweil technology helped improve his learning proves that the destination does indeed matter as it defines the path ahead:

"I can read Grade 6 books now and I am happy about that. When I am listening to my work being read back to me, I can use the word prediction to correct any errors. I am working on an assignment right now to create a fantasy land. The program has improved my confidence level. Now, I can read at a higher level on my own. Before, I had a hard time reading at the level others could and sometimes they made fun of me, I did not like that so much. Now I feel smart like I know I am." ⬣

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Education for All Mathematics Project

St. Clair Catholic District School Board

Background

This article is a reflection on the Education for All mathematics project at the St. Clair Catholic District School Board. We focused our CODE money on sustainable professional development in mathematics for our board. Deborah Loewenberg Ball tells us her story of how an increase in her own content knowledge helped her to recognize and exploit situations when key mathematical ideas came up in class. She also points out that her own "capacity plummeted when I myself was unclear about the mathematics, or when I had mistaken ideas" (Ball, 2002). We wanted our teachers to have the same kind of *"profound understanding of fundamental mathematics"* that Liping Ma writes about (Ma, 1999). She argues for connected, curricularily structured and longitudinally coherent knowledge of core mathematics. Dr. Ball also points out that it is critcally important for teachers to *"know mathematics for teaching,"* which is distinct from knowing mathematics for yourself (Ball & Hill, 2004). We used the research of Dr. Ball et al. to determine that we would focus our mathematics project on two things: content knowledge and pedagogical content knowledge. We wanted to give our teachers the opportunity to uncover and debunk any of their own misconceptions as well as to learn more about the kinds of mathematics they would need for teaching.

Keys to the success of our Education for All mathematics project were the principal's role as the instructional leader with in the school, as well as ongoing support for job-embedded professional learning. We wanted to go beyond typical professional development sessions that leave teachers with no one to help them implement new learning in their classroom and no school-based professional support system. With that end in mind, each of our schools had teams of five people who attended mathematics sessions. These teams included the principal, the program resource teacher (school-based special education teacher), and one teacher from each division. This gave teachers the support they needed back in the classroom to implement new strategies and techniques. Another spin-off advantage to having teams of five from each school was the ability of that critical mass to influence other teachers in their school.

The Professional Learning Community (PLC)

A key component of the success of this project has been the professional learning communities established in each of our schools. Every principal has PLC time for their schools—PLCs take place in every school every two weeks, with teachers having 50 minutes of release time to work with the principal and their colleagues. Often, PLCs take place with the principal along with each of the divisions. However, the principal can set the structure of each of the PLC sessions according to where the needs are. Most schools have cycles of topics for the PLCs, including literacy and numeracy.

The PLC played a large role in sustaining professional learning as well as in spreading the learning to other teachers in the school. Principals and teachers were able to collaborate on how best to integrate these strategies into their classrooms, and to reflect on many of the practices. This also had the benefit of enabling the members of the school community to support each other in the improvement of mathematics teaching.

Principal as Instructional Leader

Concurrently with this project, principals and vice-principals had received significant professional learning to develop themselves as instructional leaders within their schools. Much has been written about the role of the principal—it is a diverse role requiring an eclectic skill set, including interpersonal and political skills as well as managerial and organizational skills. However, even these necessary skills are not sufficient for today's schools. Principals need to be lead learners and leaders who help teachers reflect on their instructional practices and support them as they change them to better meet the learning needs of all students.

For the last two years, principals have attended monthly full-day sessions that have been 75% devoted to their role as instructional leaders. At the same time, we have eschewed traditional one-shot professional development sessions in favour of a series (3 or 4 days) of sessions with school teams in which the principal participates as a learner alongside the teachers. Our goal has been to develop the principal as a knowledgeable leader who can support and direct the instructional program within the school.

Teacher Researchers

Throughout our project, teachers have been committed to doing their own research by trying new strategies with their students and analyzing the effectiveness of these strategies through student achievement. Through student work samples and assessments (assessments given to some full classes and some classes with identified students), we have noticed an improvement in student achievement in mathematics. Teachers have reported that more students are understanding concepts that have been previously difficult for students to understand (e.g., fractions, decimals, operational sense, counting/quantity, etc.). Throughout the project, teachers have been exposed to many different strategies that allow students to learn concepts beyond what has been done in the past. Most program resource teachers, in particular, have been given some tools to help understand where common student misconceptions are and how to help students get past these misconceptions. For example, in one school, using strategies learned in the project (First Steps in Mathematics, 35 Dinosaur task), we were able to find 11 of 23 students in a Grade 5 class who did not have a sense of quantity—that is, they did not trust that there were always 35 dinosaurs when using different strategies (such as counting by 1's, 2's, 5's, and 10's, along with addition and multiplication). Previously, we would have suggested that the students work harder and try more of the problems they struggle with. Often, this approach only reinforces misconceptions. Using some of the strategies learned, we were able to focus our efforts and determine that these students had some serious issues relating to quantity. We were then able to focus on specific learning activities for these students and to help them gain a sense of quantity. Once students were able to get past this very limiting misconception, they were able to begin to understand operations and not just memorize them. This led to higher student achievement on operational/computational assessments.

Another example was in a Grade 5/6 class with 26 students. Students were given a place value assessment (i.e., the 52 Candies and 43 Candies tasks from the First Steps in Mathematics tool). The entire class got the 52 Candies task correct (traditional place value partition of 5 'tens' and 2 'ones'). When the same students were given the 43 candies task (non-traditional place value partition with 3 'tens' and 13 'ones'), only 8 of 26 students completed the assessment correctly. This gave incredible insight into the misconceptions that these students had. As learned in our project, these students had a 'face' value interpretation of place value. Knowing what the students' misconceptions were, we then helped clear up their misconceptions with place value by giving them problems involving non-traditional place value partitions. Prior to the project, we would have assumed that students understood place value and had generalized the patterns, when in fact they had not.

As we learned when working with students throughout our schools, such misconceptions were a common theme. Students were struggling with the idea of quantity long after we assumed that they had mastered counting. This is just one example of how student understanding, and subsequently achievement, has improved throughout our project. Other curricular areas in which we have noted an improvement are fractions, decimals, operational sense, and place value.

Knowledge of Students as Learners

"I taught it, why didn't they learn it?" is a question many educators ask themselves. The shift from teaching to learning in education is not new. With the focus on teachers as researchers in their own classroom, teachers quickly learned that having new strategies to teach mathematics only goes so far. The notion of how students learn mathematics becomes paramount. By using tools, such as First Steps in Mathematics and ideas found in Teaching Student Centered Math (Van de Walle et al.), teachers began to learn how students learn mathematics. Participants learned where common misconceptions occur and how to help students get past their misconceptions.

In our project, we used the research tool Content Knowledge for Teaching Mathematics, developed by Dr. Ball et al. at the University of Michigan. The instrument was administered prior to the project and after a series of sessions. Over the course of one year, we did see an increase in teachers' mathematical content knowledge and their knowledge of how students learn mathematics.

Lessons Learned

Throughout this ongoing project, we have learned a few things. We have learned that we need to continue to provide support to teachers as they implement new strategies in their classroom. We have taken our motto of "pressure and support" from Dr. Michael Fullan et al. We continue to expect teachers involved in the project to implement new strategies in their classrooms. But while we have this expectation, we continue to offer support. The support could take the form of classroom visits from District Numeracy/Literacy teachers (coaches) or from system-level consultants, or the support provided from the school's professional learning community. The inclusion of the program resource