



ONTARIO PUBLIC
SCHOOL BOARDS'
ASSOCIATION

Leading Education's Advocates

EFFECTIVE PRACTICES IN ELEMENTARY MATHEMATICS EDUCATION

School Board: Avon Maitland District Board

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Name of Program/Initiative/Strategy: Supporting Students with Learning Disabilities in Mathematics

Hyperlinks to Documents or Website(s) Describing this Program/Initiative/Strategy

Description of Program/Initiative/Strategy

The focus is on exemplary mathematics practices that excite, engage and increase student confidence and achievement. In the brief description please provide answers to the following questions: Where the program/initiative/strategy is delivered (school/board locations)? Who is responsible for delivering and monitoring the program/initiative/strategy? Who is the target audience? Are there any community partnerships involved? Are there any staffing or budget implications? Are there any special resources required? What are your indicators of success, etc.?

Where is the Initiative/Strategy delivered?

The Resource Teacher/Classroom Teacher partnership is supported both at the school level and in central professional development sessions. There is also a level of differentiation, as those new to the project receive more support than those that are in their second year (e.g. webinar participation).

In School Support

Resource teachers in the participating schools have at least one collaborative partner that teaches mathematics in a junior or intermediate grade. In most schools, Resource teacher time has been increased to allow for co-planning and teaching opportunities to occur in these partnerships. Support from a numeracy support teacher is available to all participants in this project at the school level (e.g. building teacher capacity in pedagogy and content knowledge).

Central Professional Development Sessions

Central professional development sessions were held throughout the year to build common understanding of the project's goals. Sessions also focused on developing an understanding of collaborative Inquiry, about effective co-planning and teaching models as well as to build teacher capacity in mathematics content and best pedagogical practices. Reflection and dialogue about the re-culturing of the role of the resource teacher were key components to all central PD sessions.

Math sessions have focused on building teacher understanding of open tasks as well as multiple representations of mathematics concepts. Resource Teachers, alongside their classroom teacher partners, have engaged in deconstructing curriculum, linking curriculum to big ideas, developing open tasks and anticipating student response as well as planning for effective consolidation. This was done in a scaffolded way that walked teachers through a planning process. The template for this is attached. This work was also supported at the school level.

Webinar Series

Resource teachers in the project participated in or are currently participating in, the Ministry Webinar series Supporting Students with LD in Mathematics that has been offered in both the 2014-2015 and 2015-2016 school years.

Who is responsible for delivering and monitoring the program/initiative/strategy?

The project has been co-facilitated by a Learning for All coordinator and a Numeracy Resource Teacher. Professional development that focused on the Resource Teacher role in schools was undertaken by the Learning for All coordinator while at the same time, the Numeracy Resource Teacher facilitated professional development related to mathematics. This has been a true collaborative project between the Learning Services and Program department.

Who is the target audience?

The target audience is Resource teachers and teachers in junior and intermediate grades. Administration has also been invited to attend professional development sessions.

Are there any community partnerships involved?

There are no community partnerships involved at this time.

Are there any staffing or budget implications?

In most of the schools involved in the project Resource Teacher time was increased to 1.0 to allow for co-planning and teaching opportunities. Furthermore, a Numeracy Resource teacher was hired to support this project.

Are there any special resources required?

The following resources were used throughout this project:

Small, Marian. Good Questions: Great Ways to Differentiate Mathematics Instruction

Small, Marian. Big Ideas from Dr. Small. Creating a Comfort Zone for Teaching Mathematics

*Attach planning template

Capacity Building Series SE#39 – Collaborative Inquiry. 2014

https://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/CBS_CollaborativeInquiry.pdf

Learning for All, 2013

<http://www.edu.gov.on.ca/eng/general/elemsec/speced/LearningforAll2013.pdf>

Katz, Jennifer. Resource Teachers: A Changing Role In the Three Block Model of Universal Design for Learning, 2013.

Armstrong, Thomas. Neurodiversity in the Classroom: Strength-based Strategies to Help Students with Special Needs Succeed in School and Life.

What are our indicators of success?

Teacher Qualitative Data:

Teacher feedback suggested that significant learning had happened through the co-learning/planning. Below are a few quotes collected from exit slips after a day spent deconstructing curriculum and planning collaboratively. Teachers were asked to reflect on their new learning and next steps.

- “Deconstructing expectations is time consuming but time well spent.”
- New learning for me was the “power of anticipating student responses.”
- “Breaking down the lesson plan leads to great consolidation.”
- Next Step: “Get the ‘stigma’ of using manipulatives out of students’ brains. They are for everyone!”
- Next Step: “Change the culture around manipulative use in the classroom.”
- New Learning: “The challenges (but importance) of developing a task based on your learning goal.”
- New Learning: “Planning to develop learning goals and big ideas. Have to know the know (nouns) and the verbs (do). I found this very helpful!”

On Implementing Open Tasks:

- “greater student engagement and an increase in participation of student's who were previously hesitant to share their thinking”

- “We have really enjoyed learning about Open Tasks. It's interesting to see the students having to think and be creative and not just plug along and answer the next question. It's also great to be able to show the students there can be many different answers. This way they don't focus so much on 'not getting it' or worrying about getting the 'wrong' answer.”

“Using open tasks helped the students and me to become more flexible in their math thinking - there are many ways to get the right answer and looking at the continuum from concrete to visual to abstract”

On Multiple Mathematic Representations in the Classroom:

- “Students had opportunities to communication using their preferred style which matched their developmental levels of understanding of math concepts.”
- “When we started our unit on fractions, we tried to make the first few lessons focus on concrete examples. We then moved to visual and lastly abstract. We felt the concrete examples gave everyone a solid base of understanding (even though some would have been ready to move to visual already.) This will help to change the culture of manipulatives as being only for those who struggle.”
- “We explored multiple representations in math with the students by trying to always incorporate the concrete, visual and abstract into our math lessons. We used hands on materials and manipulatives in our lessons. We used technology for our visuals. We tried to get students to make connections between all of these representations. If a student was having trouble with an abstract understanding, we would go back and review the concept using concrete materials and/or visuals in order to help with understanding.”

On Co-Planning Process:

- “co-planning with the planning template and going through each part one at a time was a very good use of time”
- “was valuable to work through with teaching partner - working on our own version for daily use, google docs allowing us to share ideas, questions when we don't have time to meet in person - considering using template as a google doc”

Next Steps:

Conversations have begun about how we can effectively monitor both teacher and student learning as this project is likely to continue into the 2016-2017 year as our SIM project.

What has been the impact on Student Learning?

It is our intention to examine the achievement of students with Learning Disabilities in participating in the project. Conversations are also ongoing about how both student achievement and perception can be more closely monitored moving forward.