

TLC Grant Final Report
2016-2017 Grant Evaluation

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Abstract / Professional Learning Goals

After working with Math Teacher and Consultant, Kyle Pearce through our Board's Middle Years Collaborative Inquiry (MYCI) project, the learning has led to a greater interest in exploring 3 Act Math as a way to increase student engagement using technology.

Having experienced success with 3 Act Math, we were interested in pursuing more time to research and create a teacher-friendly Resource of 3 Act Math and related on-line activities. This resource would align to the Ontario Math Curriculum Big Ideas for grade 7 (with future goals to extend this resource for grades 6 and 8). We planned to collaborate with other teachers in our board, and neighbouring boards such as Lambton Kent (ex. Jon Orr).

As Dan Meyer suggests, creating media rich tasks that are structured using the effective storytelling techniques of "acts" will increase student engagement. He goes on to state that Act One is the hook that introduces the storyline, Act Two, the tension continues to rise to its highest point as more clues are revealed, and finally, in Act Three, curiosity is satisfied with answers to your questions and tension is restored to its original state.

Unexpected Challenges

As we began our journey, we realized that there was an overwhelming wealth of material online and within other teachers. The challenge was that we felt the need to streamline our vision, to a more focussed and specific set of instructional strategies to enhance student learning. We found ourselves checking in with our original proposal to ensure that we were sticking to our intended learning goals. Inevitably, as our level of understanding increased, the learning goal evolved and became something slightly different to our initial plan.

Teaching split grade levels was also challenging in that time seemed to be compromised by having to teach two curriculums, but many of the activities had multiple points of entry and were therefore used with both grade levels with slightly different expectations.

Student Learning and Development

3 Act Math – The Use of and the Creation of...

We learned that by using engaging introductory activities, student motivation increased. Not all intro activities had to be technology based, but the majority seemed to be, and student engagement definitely increased as a result of this. Throughout of journey, we were able to create a 3-Act Math Template which was used for the students to show their thinking on paper. We also had the opportunity to sit down with Kyle Pearce for an afternoon and create our own 3-Act Math lesson on a camp experience from Tim Horton's camp which our students had attended the year before.

Student Surveys - Pre and Post

In order to gauge student engagement and motivation, we used surveys generated on [surveymonkey.com](https://www.surveymonkey.com). As shown below, results indicate that there was a general increase in overall student enjoyment in the area of mathematics. Regardless of the survey results, we noticed an increase in students participation, homework completion and increased results on math assessments.

	Pre-Test (%)	Post-Test (%)	Difference (%)
I like Math.	36	73	37
I understand when math is being taught to me.	48	68	20
Math is boring.	61	36	25
I try hard in math class.	58	84	26
When faced with a difficult math problem, I give up easily.	57	31	26
Math class is kinda fun.	53	87	34

Student Learning - Definite increase!

3 Act Math – has finally brought math learning to life for the students. The days that 3 act math were used were by far, the most engaged students were in their learning. Students never gave up. They supported each other and were honest in their struggles and celebrated each others

successes. We noticed their perseverance grow within the classroom, and especially our former, 'non-math' students.

Student quotes from survey:

“This kind of math really challenges me and makes my brain grow.”

“It’s stressful but I like it a lot.”

“It’s more fun when we do math this way. It’s not really math!”

“The lessons are more fun and we even get to watch videos sometimes!”

“We get to do math with our friends and talk about normal things, like building a deck.”

Technology

The use of technology in math class has changed significantly. Using a Minds On with *Estimation 180* for example, opens up the day of learning with visual stimulation and engagement. Math consultant, David Gomes visited our rooms and set students up with homeworkhelp.com, a free online tutoring site offered by the Ontario Ministry of Education. Sharing student recordings of work on *Edsby* validated student voices in math and offered parents a glimpse into math. *Explain Everything* was a daily fixture of math in our classrooms which has helped students conceptual understanding.

Professional Sharing

Monthly staff meetings

We shared ideas during our journey that teachers could take back to their classrooms on a monthly basis at staff meetings. *Which One Doesn't Belong* was especially well received as it can be used at all grade levels to stimulate math talk. All staff was receptive to the new ideas to generate more student interest in the area of math.

Carousel Sharing - Professional Development day

We presented the project journey at a Professional Development session in a carousel format to groups of teachers throughout the day. Teachers were eager to hear about the grant, our learning, student learning and our success. Many had questions regarding the process and how to work with the TLC. It has certainly sparked interest in the TLC grant!

School Wide Book Talk – Jo Boaler’s Mathematical Mindsets

With a focus on math, our administration, Kyle Pearce and one of our team member's, Nicole Palazzi chose Jo Boaler's book, *Mathematical Mindsets* to use for our book talk this year. We were able to meet three times throughout the year with 10 teachers on staff including the SERR consultant and school psychologist. This book talk enabled teachers to discuss and share new learning in the area of math instruction.

Jo Boaler's Mathematical Mindset course - Summer 2017

Our team leader, Nicole Palazzi has signed up for Jo Boaler's course this summer, and intends on sharing with the rest of the team in the fall.

Kyle Pearce - 'Mathlete' and Consultant

The application for this grant was a follow-up to our Board's *MYCI (Middle Years Collaborative Inquiry)* program during the 2015-2016 school year. Since the learning was so rich, we decided to continue our learning and apply for the grant. Kyle, who was leading the *MYCI* project was on board with us. The program superintendent then aligned Kyle to our school for the year. He has attended the majority of our staff meetings to share lessons on math, focusing on conceptual understanding, and has made himself available to all teachers in the building. Having him present has certainly added to the richness of staff PD. He is an innovative thinker and easily inspires with his genuine love of the subject and interactions with people in general.

School Visits / Collaboration with Colleagues

The grant helped us meet our goals with teacher collaboration. We have been able to meet with at least 4-5 teachers in a variety of schools to formally and informally talk math. School visits have allowed us to discuss math with other teachers, students and administration. The flexibility of the release days has been instrumental in the TLC goal of collaboration. It was especially interesting to see schools from a variety of socio-economic backgrounds. The differences in student performance and motivation were eye-opening.

Schools visited: Southwood Elementary, Windsor, ON
 Northwood Elementary, Windsor, ON
 Roseville Elementary, Windsor, ON
 Herman Secondary, Windsor, ON
 McGregor Secondary, Chatham, ON

Jon Orr - Secondary School Math Teacher and Math Consultant

Visiting the real math geek was an enlightening experience. The grant allowed us to visit his grade 9 applied classroom in Chatham, ON. Implementing his and others 3 act math approach to math has tremendously increased his classes grade 9 EQAO scores. This real world approach to learning has changed students views toward math. Mr. Orr was more than willing to share his

experiences, and his own personal math journey. Upon our return, we tapped into mrorrisageek.com to use more of his lessons with our students.

Jody Wells-Caversan - Grade 6 Homeroom Teacher, and AQ Math Specialist Teacher

We were able to meet with a colleague from Barrie, ON for a day of informal learning in Windsor. Sharing her knowledge as an intermediate teacher, former math coach and AQ math specialist instructor led to new construction of knowledge. It was great to receive feedback from ‘an outsider’ to our project, and led us in the same direction, but with some tweaks.

Project Evaluation

Were we successful? YES or no?

We believe so. And our belief stems not from the completion of an online document, but through a new approach to teaching math in our classrooms. We have certainly seen the light, so to speak in regards to the way children learn math. Hattie states that “Experts and experienced teachers do not differ in the amount of knowledge they have about curriculum matters or knowledge about teaching strategies. But experts do differ in how they organize and use this content knowledge”. (Hattie, 2003) This project provided us the time to build on our existing knowledge base and begin to create an easily accessible bank of 3 Act Math resources that are accessible to all. This is section that we don’t feel as much success in. The document proved to take a back seat to our relentless search for the best possible use of 3-Act Math and technology in the elementary classroom. Professional dialogue was the central focus of our journey.

There has been significant work done in the area of Mathematical Mindsets by leaders like Jo Boaler (2015), who explains how our beliefs are strongly tied to our behaviour. From our brief experiences with 3 Act Math in our classrooms, we have found that beliefs towards math were becoming more positive in general, thus increasing an overall interest toward mathematics. Our students were also displaying a more productive disposition, which is vital to our success while teaching our compensatory student population. The learning continues.

Goals for next year:

- a. Continue to develop the online bank.
- b. Attend Jo Boaler’s online summer course
- c. Assemblies – add a Math Growth Mindset Minute to our monthly assemblies
- d. Lead our school book talk – Number Talks by Sherry Parrish or Visible Learning by John Hattie
- e. School Wide Problem Solving Model based on Singapore Math – Part, Part, Whole

- f. Fresh Grade – an online support that we have interest in pursuing
- g. No marking vs. descriptive feedback study

Resources

Books:

Boaler, Jo (2015). *What's Math Got To Do With It? How Teachers and Parents Can Transform Mathematics Learning and Inspire Success*. Paperback. Jossey-Bass

Boaler, Jo (2015). *Mathematical Mindsets*. Jossey-Bass

Fiore, Mary, Lebar, Luisa, (2016). *The Four Roles of the Numerate Learner*, Pembroke Publishers.

Hattie, John A. (2016) *Visible Learning for Mathematics. Grades 7-12: What Works Best to Optimize Student Learning*, Corwin Mathematics/SAGE Publications.

Small, Marian. (March 8, 2012). *Good Questions: Great Ways to Differentiate Mathematics Instruction, 2nd Edition*. Paperback. Canada: Nelson.

Small, Marian. (February 9, 2012). *Making Math Meaningful: to Canadian Students, K-8*. Paperback. Canada: Nelson College Indigenous.

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