

Title of Project: Exploring Learning and Differentiated Instruction for the Difficult to Learn Topic of Grade 6 Fractions Using Teacher-Coach-Researcher-Developer Networking

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Lead Institution: Simcoe County District School Board

Project Partners: Ontario Ministry of Education, Trent University, Ontario Institute for the Study of Education at University of Toronto, District School Boards, Council Ontario Directors of Education (CODE)

Ministry Priority: Teaching and Learning

Brief Background: Grade 6 fractions is a difficult concept to learn (Armstrong & Larson, 1995; Kamii & Clark, 1995). This project is designed to impact mathematics learning and teaching in Ontario by building collective capacity through real-time development of a complex instructional resource. Assessing for learning, effective questioning, and differentiating instruction are effective instructional strategies for making tasks accessible and impacting student achievement. As Fullan (2010) suggests, in order to address complex instructional issues, resources need to be developed that incorporate more than one of these instructional strategies. No such resources currently exist for teachers of Grade 6 mathematics. Moreover, findings from previous research projects by the Lead Researcher exposed a general lack of readiness for Grade 6 teachers to differentiate mathematics instruction.

Research Context: Using an emergent design, three groups of teachers with mathematics coaches will document the actual planning processes they use and the decisions they make as they prepare to differentiate instruction for Grade 6 fractions. Analysis of the data will yield themes and common processes across groups, which will inform the creation of a framework for planning. Once the framework is created, it will be beta-tested through use in a variety of teaching contexts for its validity and ease of use.

Knowledge Mobilization Activities: Throughout the project, there will be discussions about the project at: (1) **Ontario Mathematics Coordinators' Association (OMCA) monthly meetings;** (2) **meetings at Fields Institute of Mathematics;** and (3) the **Mathematics Teaching and Learning Work Group.**

Further, the project will post research-related products (assessment tools and tasks, lesson plans and related classroom video, research synopses, research papers, research-affirmed instructional trajectories) on the EduGAINS – Math website with links to roles and responsibilities. Registration to follow-up implementation supports will also be accessible through this website. The annual Professional Learning for Mathematics Leaders and Coaches series will share resources, information, and opportunities for board representatives to share implementation stories. Finally, researchers will present their papers at a range of provincial and international research conferences including Ontario Association of Mathematics Educators (OAME) Annual Conference May 2012 and May 2013.

This research brings together partners who can influence the type and quality of pre-service and in-service professional learning support for teachers of mathematics; ongoing ministry-sponsored implementation support for teachers; ministry-sponsored development of instructional and intervention materials for students; and provincial networks amongst mathematics educators and researchers. Since artifacts of this work will be aligned with ministry goals and approaches, they will be accessible to all through the MathGAINS website.

Outcomes: This project provides a tactical basis for resource development, as well as examines the impacts of the development process and artifacts and their transferability to other classroom contexts and to other difficult to learn topics.



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