



NATIONAL INSTITUTE FOR LEARNING DEVELOPMENT

Rx 4 Discovery Math II

Course Syllabus

I. COURSE DESCRIPTION

This is a lecture and laboratory course designed to train teachers to provide mathematical intervention in a group setting. Rx for Discovery Math II is specifically intended for students in grades 6-8 who would benefit from intensive, small-group instruction in mathematics with an emphasis on fostering self-regulated learning behaviours and beliefs, improving problem-solving skills, strengthening mathematical fluency, enhancing discourse and peer collaboration, building metacognitive skills, and improving non-cognitive factors affecting mathematical thinking and learning.

Rx for Discovery Math II supports educators to establish classroom contexts that develop students' self-regulated learning behaviours and beliefs. Students who are self-regulated apply knowledge, skills and dispositions to engage in mathematics learning with confidence.

II. COURSE PURPOSE

- A. To provide weekly, small-group mathematical intervention that includes activities to strengthen mathematical reasoning, computational fluency, conceptual understanding and self-regulation.
- B. To create a learning environment where mediation and discovery are the means by which students grow in their understanding of mathematics and of themselves as competent learners.
- C. To encourage a sense of belonging in each small group where cognitive functions are strengthened. This will provide a safe environment where collaborative academic struggle is embraced and seen as a way to strengthen thinking skills and increase individual confidence and competence.

III. COURSE OBJECTIVES

- A. **GENERAL:** Successful completion of this workshop will enable the participant to facilitate deeper mathematical thinking for students by understanding how to strengthen students' conceptual understanding, computational fluency, and mathematical reasoning skills by, developing self-regulation and cognitive functions

through a safe mathematical community where productive disposition, self-efficacy, a sense of belonging and mathematical exploration is encouraged.

- B. **SPECIFIC:** Upon completion of this course, the participant will:
1. Acquire an understanding of rational numbers and mathematical fluency.
 - a. What are rational numbers?
 - b. Why is understanding them critical for mathematical fluency?
 - c. What are the other components of mathematical fluency?
 2. Discover the cognitive processes necessary for mathematical thinking and gain skills to strengthen students' cognitive functioning and mathematical confidence through targeted intervention activities and specific questioning and feedback.
 3. Demonstrate an ability to work with groups of 4-6 students in the teaching of basic mathematical problem-solving skills focusing on rational numbers and computational fluency.
 4. Apply the theory of mediated learning while teaching students SRL in mathematics with an emphasis on rational numbers and deepening students' conceptual understanding of fractions, decimals and percent.
 5. Assess students' level of self-regulation and determine teaching practices that supports SRL development.
 6. Design a plan for group implementation that would meet the learning needs of a specific group of students.

IV. COURSE MATERIALS

- A. **Developing Mathematical Fluency* by Grayson H. Wheatley & George E Abshire (Purchase this e-book at www.mathematicslearning.org)
 - B. **Mediated Learning: Teaching, Tasks, and Tools to Unlock Cognitive Potential 2nd Ed* by Mandia Mentis, Marilyn Dunn-Bernstein, and Martene Mentis
 - C. **NILD Mediating Math Student Workbook: Decimals, Percents & Fractions*; (Purchase at www.learninghouse.ca)
- *Please bring with you to the training.**

V. COURSE REQUIREMENTS

- A. **Prerequisite:** None
- B. **Pre-Course Preparation:**
 1. Read pp. 1-33 in *Developing Mathematical Fluency* and familiarize yourself with the math activities contained in the book.
 2. Also read Part 2 pp. 9-52 and review Part 3 in *Mediated Learning: Teaching, Tasks, and Tools to Unlock Cognitive Potential*.
 3. Read the following article: [Scaffolding the development of self-regulated learning in mathematical classrooms](#)
 4. View the following PowerPoint Presentations:

- a. [Overview of Middle School Mathematics](#)
- b. [Mediated Learning Experience Overview](#)
- c. [Small Group Mediation](#)

VI. COURSE WORKLOAD

The time required for assignments and pre-course assignments has been estimated at four hours.

VII. COURSE EVALUATION

Participants will practice the mathematics and SRL teaching techniques with a small group and receive group feedback on their demonstrations.

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