
Mathematics Education
L'éducation mathématique
(Org: **Walter Whiteley** (York))

MALGORZATA DUBIEL, Simon Fraser University, Department of Mathematics, 8888 University Drive, Burnaby, BC, V5A 1S6

Evolution of Math for Elementary Teachers course at SFU

SFU has been offering Math 190, Mathematics for Elementary Teachers course for over 20 years. The course has been evolving over the years, from one focussed on set theory interpretations and proving algebraically rules and properties of operations, towards one that stresses students' understanding of concepts and problems, and appreciation of mathematics as a discipline. Group work, projects and mathematical investigations have become integral part of the students' experience. However, the course is still very much "under construction", exploring ways to provide students with a meaningful experience that will, hopefully, help them become better teachers of mathematics.

FRÉDÉRIC GOURDEAU, Université Laval, Québec

Mathematics for teaching: the case of Université Laval

The integrated 4-year degree leading to the bachelor in education, option mathematics, comprises a mixture of standard mathematics courses (linear algebra, calculus) and many specially designed mathematics courses. In this talk, I will describe the main features of those courses.

KATHY KUBOTA-ZARIVNIJ, TDCSB; Ministry of Education

LOUIS LIM, York Region District School Board

Incorporating the History of Mathematics in High School

Since practice teaching, Louis has shared specific instances of incorporating the history of mathematics in grades 9–12 mathematics with his students. In this talk, examples are provided on connecting mathematics and history, along with resources identified. Questions explored will include: Should there be specific expectations in the curriculum documents that make reference to the history of mathematics in the next round of revisions? How do classroom teachers gain knowledge of the rich history in mathematics? Can the history of mathematics (including non-European mathematics) help shape students' attitudes and nature of mathematics?

JOHN PERCY, University of Toronto at Mississauga, 3359 Mississauga Road, Mississauga, ON, L5L 1C6, Canada

Undergraduate Science/Math Education Programs at the University of Toronto at Mississauga

During the last decade, I have built up a set of courses and programs in science (including math) education for undergraduates at the University of Toronto at Mississauga. SCI398Y is a core course in science education, designed to introduce education as a discipline, a possible career, and as a part of the subject in which the student is majoring. SCI499H is a fourth-year science education project course in which students create reports, resources, and events which benefit UTM and its community.

SCI498H (Teaching Opportunity Program in the Sciences) enables students to facilitate student learning at the introductory post-secondary level, under the supervision and mentorship of a faculty member—not as “the sage on the stage” but as “the guide on the side”. These courses can be taken as part of a Science Education minor program which students can combine with their other programs. The Early Teacher Program guarantees students admission to the BEd program (Science or Math) at OISE/UT if they meet five stringent requirements. In 2007, we will inaugurate a Concurrent BSc/BEd Teacher Education Program in science and math at UTM, in partnership with OISE/UT. Many of the students in these courses and programs also participate in science outreach programs for schools and the public. In this paper, I will reflect on the past, present, and future of these courses and programs, with some emphasis on students in the mathematical sciences.

KATHRYN STEWART, York Region School Board

TARA TAYLOR, St. Francis Xavier University, Antigonish, Nova Scotia, Canada
Math and Service Learning: Bringing Math to the Community

What is service learning? How can we bring a service learning component into math classes? Why is service learning a valuable component? This presentation will attempt to answer these questions.

MATH 100 (Mathematical Concepts) is a course intended for students wishing to go on to an education degree, and is required for the elementary education stream at StFX. This is the first year that the course includes a service learning option, so the presentation will report on how this is going. Students who choose to do the option decide on a community group (school classroom, cub scouts, adult ed. upgrading group, etc.) and an activity that includes some mathematical aspects and is both appropriate and relevant for the community group.

After the activity is planned and done with the chosen community group, the students reflect on their activity in a written report and an oral presentation to the class. The goal of the presentation is to stimulate discussion about service learning in math and to encourage other educators to consider service learning for their math courses.

WALTER WHITELEY, York University, Toronto, Ontario
Programs in Mathematics for Future Teachers

In many universities, an important cohort of mathematics majors are preparing to teach mathematics at the secondary level. Increasingly, research and discussions in Mathematics Education are identifying specific courses, and specific processes which should be included in the undergraduate programs of future teachers. In 2002, a working group at the Canadian Mathematics Education Study Group identified some key content and pedagogical features to be included within such programs. (The link http://wiki.math.yorku.ca/index.php/Mathematics_for_Education_Program has a download of this report.)

In this session, we will approach the topic from two directions:

- descriptions of courses for future teachers of mathematics, currently offered, or being designed, in Mathematics (and Science) departments;
- reflections by classroom teachers about lessons that they wish they had learned in their own undergraduate programs in mathematics.

I will begin the session with a short review of these CMESG recommendations and an introduction of the speakers for the day. I will bookend the session with a presentation of the new Mathematics for Education program at York University (see the link above). I will discuss our plans for our redesigned capstone course for the program: Topics in Mathematics Education. Rather than focus on specific material to be mastered, this course will focus on processes, such as group work, open ended

investigations, expanded proofs as 'convincing arguments', the process of 'unpacking' concepts and problems, and reflections on the practice and learning of mathematics.

We plan to provide ample opportunity for discussion during the day.