
Supporting Numeracy for Non-STEM Students
Supporter la numératie pour les étudiants non-STIM
(Org: **Kseniya Garaschuk** and/et **Vanessa Radzimski** (University of the Fraser Valley))

ED DOOLITTLE, First Nations University of Canada
Numeracy for Indigenous Teacher Candidates

In the Indigenous Education program at First Nations University of Canada, elementary teacher candidates must all take MATH 101: Introductory Finite Mathematics I, a general interest, terminal course in mathematics taken by all University of Regina Education and Arts students. We have modified the course to cover topics and examples of importance to Indigenous teachers, some of which will be discussed in this presentation.

VIKTOR FREIMAN, Université de Moncton

New Brunswick path to numeracy in technology-rich environments: what elementary school teachers should be aware of ?

There are two recent trends in New Brunswick (NB) inclusive schools that require attention of elementary teacher educators: numeracy shift in K-12 mathematics curriculum and increasing role of technology via the use of tangible digital devices, robotics, 3D printing, and coding platforms (Freiman, 2022). More recently, data literacy and big data add other opportunities. How should it impact teachers' professional learning? Based on the in-school research on technology-rich environments, such as makerspaces and flexible classrooms (LeBlanc, Freiman, and Furlong, 2022; Chiasson and Freiman, 2022), numerous workshops with teachers and schoolchildren, as well as integration of technology into undergraduate courses in mathematics education at Université de Moncton, we will discuss how technology changes the nature of mathematics, its relation to numeracy and the way how mathematics is taught and learned in the 21st century to become more real-life connected, hands-on, interdisciplinary, and transdisciplinary and what type of support is needed for teachers to take an advantage of these experiences.

ANDREA HYDE, College of the Rockies

Numeracy in Pre-Ed Students in Rural BC

In this presentation I will explore the relationship between numeracy, Polya's problem solving process, and math anxiety in pre-education students at a small, rural BC teaching college. The focus of this talk is my practices and experiences with my students.

FOK SHUEN LEUNG, University of British Columbia

Poetry without Grammar

We tell novice instructors that big ideas matter – that math is a technical subject, certainly; but that unless the tools and techniques orient toward big and beautiful ideas, we are technical advisors, teaching all grammar and no poetry. First-year Math students have years of experience being rewarded for doing calculations well; we need to remind them that calculations can be meaningful.

But what happens when we encounter students who don't even have the grammar experience? This talk explores recent experiences in a course aimed at such students. Can we teach poetry without grammar? Should we?

MIROSLAV LOVRIC, McMaster University

Why numeracy should have a life of its own

In this talk I will discuss the design and teaching of my university-level numeracy course "Numbers for Life," to outline the benefits of viewing numeracy as an entity separate from (but of course, tied to) mathematics. Whereas mathematics involves

thinking *about* numbers, numeracy (guided by the context of the situation) involves thinking *with* numbers. To support my arguments, I will contrast numeracy tasks with mathematical tasks, and emphasize the importance of the transfer from “school mathematics” to “real-world” problems.

ASIA MATTHEWS,

Combining Numeracy and Rhetoric in an Interdisciplinary Modelling Course

I have always been interested in the similarities and differences between numeracy/quantitative reasoning and mathematics: I initiated a "numeracy week" at an Ontario elementary school six years ago, I continue to provide mathematics enrichment to school kids and teachers, and during my time at Quest I supported the challenge of distinguishing our QR program from the mathematics curriculum. At Quest, QR and Rhetoric were the foundational streams for our Arts and Sciences BA degree, threading throughout the interdisciplinary curriculum. But they weren't everywhere. And our students weren't challenged to strengthen both skills consistently. The mathematician in me thought to pose myself a wee problem: what would a *really good* course focused on numeracy and rhetoric skills rhetoric look like? Completely unrelated, I was inspired by Yvan's description of a modelling course at the 2019 FYMSiC meeting and thought to design such a course for Quest. Only later did I realize that the way I designed this modelling course answered the problem. In this talk I'll explain the design and implementation of an interdisciplinary modelling course which effectively draws out numeracy and rhetoric skills in concert.

NETWORKING MEET AND GREET,

ANTON MOSUNOV AND GAVIN OROK, University of Waterloo

Assessing the Effect of an Illustrated Storybook on Correcting Common Misconceptions About Mathematics

Innumeracy is rarely not accompanied by mathematical anxiety, and many factors contribute to its formation. For example, students may have difficulty caring about the subject because of how abstract and disconnected from real life it may appear, leading to them being less engaged in their classes. In addition, women can feel outnumbered in their mathematics classes and are discouraged from pursuing STEM careers because they see fewer female role models in math. These aspects often lead to fewer students pursuing math courses, resulting in lower academic performance.

On the other hand, having a growth mindset has a positive effect on performance in math, including numeracy. With a team of writers and artists we've authored an illustrated storybook whose goal is to help students to develop a growth mindset towards mathematics and address some common misconceptions about it. Our book contains a number of exercises, including basic ones on primes, that are accompanied by visual aids to engage the readers in the young target audience. In our presentation we will present the book and introduce our research project, which aims to assess the effect of our storybook on correcting misconceptions about mathematics among first- and second-year undergraduate students. Our research project has been given ethics clearance and will commence in Winter 2024.

OPEN DISCUSSION,

CHRISTINE SUURTAMM, Faculty of Education, University of Ottawa

Equity and Mathematics Teaching and Learning

This presentation will challenge the notion of labeling students in Grades K – 12 as being non-STEM students. Rather, it will examine ways that teachers and students can see themselves as mathematically capable and engage in STEM subjects. Seeing the teaching and learning of mathematics through an equity lens means teaching in ways that can engage all students and allow all students to tackle mathematics problems in various ways that draw on their own experiences. Examples will be drawn

from the current Grade 1 – 9 mathematics curriculum in Ontario, including its initiative of a destreamed Grade 9 mathematics course. Not only will it look at the curriculum but it will also discuss teaching practices that aim to get all students involved in mathematical thinking.

NAHID WALJI, UBC

Mathematics and Numeracy for Liberal Arts Students

There are many courses aimed at liberal arts students that are specifically designed to fulfil their mathematics requirement, including courses with titles such as “Math for Life” or “Math for Liberal Arts”. These have two main goals: the first is to ensure a sufficient level of numeracy amongst such students and the second is to enable the development of a positive attitude towards mathematics. These courses are often the last classroom experience of mathematics that such students will have, and therefore can have a long-term impact on their comfort level and opinions of mathematics. I have experimented with different teaching approaches at various institutions, aiming to strike a balance between emphasising practical skills and exploring more advanced topics to improve student engagement. In this talk I will describe my experiences and challenges in teaching these students, share how they changed preconceptions about non-STEM students, and discuss approaches that were successful.