
Indigenization and Reconciliation through University Mathematics: Why, When and How ?
L'autochtonisation et la réconciliation par l'entremise des mathématiques universitaires : pourquoi, quand et comment?

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MELANIA ALVAREZ, PIMS/UBC

Math Outreach: Many Needs, Many Ways

I will present a wide range of math educational outreach activities involving Indigenous students. By expecting children to succeed, introducing new and exciting ways to teach mathematics, and promoting role models, the Pacific Institute for the Mathematical Sciences (PIMS) and the mathematics department at UBC are making a significant difference in the way Indigenous students view science and technology and their own mathematical ability.

DARJA BARR, University of Manitoba

Easing the Transition into University Mathematics with Summer Bridge Programs

The transition from high school to university is difficult for many students, especially in the subject of Mathematics. For Indigenous students, this difficulty may be compounded given cultural and academic differences in their backgrounds. This talk will describe the two main summer bridge programs that have been put in place at the University of Manitoba, aimed at supporting incoming Indigenous and First Nations students towards success in their university math courses.

CEDRIC CHAUVE, Simon Fraser University

Designing Coast Salish woven basket patterns using Jupyter notebooks

We describe the use of the Jupyter notebook framework to develop a tool aimed at modelling and designing patterns observed on Coast Salish woven baskets. This tool can be used as a teaching tool to introduce simple notions of geometry or by basket makers to design and visualize new patterns. This work, done in collaboration with Laura Gutierrez-Funderburk, Jenifer Pham, Howell Tan and Veselin Jungic. It was funded by the Callysto project, recently launched by the Pacific Institute for the Mathematical Sciences to promote the use of Jupyter notebooks in classrooms, and is part of a collaboration with the Tla'amin Nation.

SHAWN DESAULNIERS, University of Alberta

Is Recruitment Enough?

Recruitment and retention of Indigenous students within STEM is now a priority for many post-secondary institutions across Canada. While many universities now employ a specialized Indigenous recruiter, most lack a retention counterpart. In this presentation we will discuss ways the mathematical community can work together to better support Indigenous students admitted into STEM programs.

EDWARD DOOLITTLE, First Nation University of Canada

HENRY FOWLER, Navajo Technical University

The Silence Beat of Mathematics

As educators, when we teach math, we witness silence in classrooms. Students lack the interest to explore the beauty of mathematics. In this session, an innovative Navajo math program will be discussed. The new Navajo math program changes how math is delivered to the Navajo students. This new pedagogical approach integrates Navajo culture and songs to teach math concepts. Also, Navajo cultural math posters were devised for classrooms to sustain the students' mathematical understanding and inspire students to learn mathematics.

VESELIN JUNGIC, Simon Fraser University
Teaching each other: Working with Indigenous learners

In this presentation I will share some of my experiences working with Indigenous learners of all ages. This work has ranged from playing with mathematical toys with kindergarten students, to building mathematical objects with elementary school students, to solving puzzles with high schools, to collaborating on mathematics related projects with distinguished elders. I will describe how this work has influenced me as a teacher and mathematician.

MARK MACLEAN, University of British Columbia
Expanding the Mathematics Curriculum Conversation for an Indigenous Teacher Education Program

BC's Ministry of Education requires teacher candidates to have completed a university-level course in mathematics to qualify as an elementary school teacher. We are at the beginning of a process that engages faculty, students, and community members involved with UBC's Indigenous Teacher Education Program (NITEP) to design a new MATH course to meet this requirement. I will talk about this conversation and consultation.

EMILY MCKINNON, University Of Manitoba
Access to Success in Math: Lessons learned and new directions for the University of Manitoba's Access Program

The goal of the University of Manitoba Access Program is to support students who face barriers (academic, personal, financial) to success in a post-secondary environment. Most of our students (90%) are self-declared Indigenous (First Nations, Métis, Inuit) and many (60%) are from communities outside the city of Winnipeg. Transition to university is a major challenge for all students, including those in the Access Program. In this talk, I will describe some of the typical attributes of Access Program students – their academic background, preparation level, and academic goals. I will then focus on academic challenges of Access Program students in first-year math and sciences courses. I will discuss outcomes of Access Program students relative to the general student population in some of the more popular science courses, and summarize the impressions of academic advisors, personal counsellors, and instructors who have worked with students directly. There is a strong need for more supports for Access Program students in math, including increased pre-university preparation, and transition support specific to math success. I will end by discussing some new initiatives in the Access Program designed to increase student success in math.

CYNTHIA NICOL, University of British Columbia
What Role does Mathematics Play for Community Resilience and Innovation?

In this session I offer ideas for critical dialogue on strategies for reconciliation through place/land for teaching and learning mathematics. What do communities say they want and need to support improved educational experiences for their learners? This session will explore this question and teaching approaches that support and build upon community strengths for mathematics education.

LILLIAN PRINCE AND DENNIS CONTOIS, Native Education College
Colonialism, First Peoples and Adult Basic Education in Canada

Focused research in adult basic education for First Peoples and other marginalized groups in Canada is a recent sociological undertaking and remains largely neglected as a serious area of inquiry in the social sciences. This research examines the

impact of colonialism on knowledge acquisition for First Peoples in Canada, and the pedagogical relationship between First Peoples, academic institutions and the Canadian state. Other areas of inquiry include traditional forms of indigenous knowledge acquisition and a brief history of race and ethnicity in adult basic education. The research is significant in that it addresses the inherent difficulties of trying to incorporate and implement reciprocal styles of learning as an alternative to the conventional unidirectional and culturally predominant pedagogy in the educative process for First Peoples in Canada.

RANDALL PYKE, Simon Fraser University

Reaching out to the Aboriginal community: Volunteer tutoring at the Native Education College in Vancouver

For the past 11 years students and faculty from Simon Fraser University have been volunteering as tutors at the Native Education College (NEC) in Vancouver. The NEC offers courses in science, English and mathematics (and other subjects) to a mainly mature student body, most of whom are returning to school to complete their high school diplomas and going on to further training in trades, professional programs, and university. The NEC is a culturally appropriate and supportive learning environment for Aboriginal learners. Through the dedicated work of the teachers and tutors, many students have successfully completed their program of study. The volunteers have also benefited in many ways from their interaction with these students and the staff at the NEC.

BETTY WILSON, Tla'amin Nation

A Tla'amin Perspective on Math

This talk will discuss how Indigenous knowledge is infused with math. Math was involved in building housing, canoes, tools, clothing, and weaving baskets. Each item was not only functional, but also an art form. For example, baby baskets were designed to be beautiful and only certain parts of the root were used to make sure when the cedar was dry, the basket was shiny. The talk will involve presentation of pictures of baskets, fish traps and other items that make use of mathematical knowledge, where repeating patterns are part of the structural and aesthetic design of the object.