LAUREN DEDIEU, University of Calgary
Authentic Applications for Future K-12 Mathematics Teachers

At the University of Calgary, I have the pleasure to teach future K-12 teachers in our mathematics appreciation course and mathematical inquiry course. Through activities that encourage students to authentically engage in mathematics, I work to illustrate the beauty and importance of math so that pre-service teachers feel inspired to share their passion for mathematics with their future students. In this talk, I will highlight the activities and assessments I use to establish relevance in the subject matter by exploring real-world applications.

SEAN FITZPATRICK, University of Lethbridge
Supporting applied content with open education technologies

Almost every science student takes a course in either calculus or linear algebra. Often, the curriculum for these courses is designed around the perceived need to have students write supervised exams, with all computations done by hand. (If the student is lucky, they will be allowed a scientific calculator.) Sometimes there is a lab component, but it often involves expensive proprietary software that students cannot access from home.

This significantly limits the amount and types of applied content that we can include in these large service courses – courses that would better serve our science students (and even math majors) if they included relevant applied content.

I have been slowly introducing computational components to both calculus and linear algebra courses, using Python (and SymPy, which provides a fairly user-friendly interface for basic tasks). To avoid burdening students with installing Python on their own computers, I provide two access points: Jupyter notebooks, using the Syzygy hub provided by PIMS, and PreTeXt-based open textbooks, which can run Python code in-browser using embedded Sage cells.

EMILY KOZLOWSKI, Waterloo
Student Analysis of Contextualized/Real Data in Introductory Statistics

The majority of students approach statistics with much disdain and limited interest in its theoretical complexities. At most, they have a desire to learn the coding aspect of using a statistical analysis software such as R for the purpose of running analysis.

Historically, the primary use of R in an introductory statistics course at our institution was as a tool for students to run template code that generates output based on simulated data. Students were then tasked with interpreting this output.

In this presentation I will discuss the approach taken by myself and my co-instructor to revamp the assignments in this course to create an authentic application for the students. We elected to provide the students with a contextualized dataset used throughout the course, and to teach students the aspects of R coding required for them to create their own code and complete the analysis on their dataset. Our goals in this endeavour were two-fold: to provide students with the skills they desired for conducting statistical analysis, and to harness students' motivation for analyzing real data to engage them in a nuanced teaching of the theoretical complexities of statistics coupled with applying data analysis thoughtfully in any application.

COLLETTE LEMIEUX AND OLIVE CHAPMAN, Mount Royal University and University of Calgary
Interactive Stories in Teaching Postsecondary Introductory Statistics

Recommendations for reform in statistics education suggest the use of active learning, real or realistic data sets, and technology to aid students in developing statistical knowledge, reasoning and thinking. We conducted a study to explore an innovative

pedagogical approach based on these recommendations and consisting of interactive story-based tasks to support students' meaningful learning and understanding of statistics. This presentation focuses on the design and nature of these tasks Collette Lemieux developed and implemented in a first-year, undergraduate algebra-based, business statistics course to support students' learning of selected statistics topics, including: descriptive statistics, sampling distributions, confidence intervals, and informal inferential statistics. The presentation will also include examples of the tasks and discuss the usefulness and features of these tasks to support meaningful learning and different levels of understanding of the statistics topics.

MIROSLAV LOVRIC, McMaster University
What's authentic about "authentic"?

As it is not clear to me what "authentic" really means, I will spend a bit of time trying to explain how, I believe, "authentic" could be conceptualized, and what the benefits would be for mathematics instruction and beyond. To illustrate how this conceptualization works in practice, I will mention the UV index; as it does not involve more than elementary functions and integration, this topic can be discussed in a calculus class.

KARYN MCLELLAN, Mount Saint Vincent University
Shifting Perspectives in Mathematics

We all know students often have a hard time comprehending the importance, relevance and scope of mathematics, and this is especially true for students in service courses. In this talk I will review some activities from two Mathematical Concepts courses I have taught which I found to be particularly useful in shifting students' perspectives on the subject. By viewing numeration through a historical lens or the eyes of a child, from realizing math encompasses much more than algebra to contemplating its paradoxical nature, or by learning how certain thinkers disrupted the mathematical and even social norms of the time, students gained a deeper appreciation of the subject, or at least were able to look at mathematics in a new light, which to me is an important takeaway.

DIANA SKRZYDLO, University of Waterloo
Improving the Chances a Computer Science Student will Learn Probability

A basic understanding of probability and statistics is fundamental to machine learning. But unless you point out the relationship, a first year computer science student may wonder why they have to take a statistics class at all! My talk will discuss the authentic applications, such as gaming and machine learning, that I incorporated gradually over several years to an introductory probability course, and the impact this had on student learning. Once they start to see how central probability is to their lives and field of study, it can't be ignored.

ASMITA SODHI, Dalhousie University
Connecting concepts and community

As a pure mathematician who has taken absolutely no life sciences courses in their entire life, I am well-suited to teach calculus, but perhaps not so well-suited to convince my students in a one-and-done life sciences calculus course as to why they should care about this class beyond ticking off a box that gives them a required math credit. This semester, I intend to connect my students to members of the community working in the life sciences through including the work of these community members (loosely) in course assignments, as well as through a series of interviews. The hope is that students enrolled in life science calculus will be able to learn about different STEM professions and areas of study, and to see how they may encounter ideas from their math course in their future work. In this talk, I'll give an overview of how this project is going – it will still be in progress at the time of the conference!