MY TEACHING PHILOSOPHY

The earliest memory I have of a teacher is from the movie *Dead Poets Society* when the students stand upon their desk as a tribute to the impact the teacher had on their lives. This was in stark contrast to my first day of remote teaching during a pandemic, where my laptop screen was full of small dark boxes that looked like a power-outage during *Hollywood Squares*. To me, it was clear I needed to prioritize my teaching approach to create a sense of community for the students. This experience was critical as an early-career instructor as it re-affirmed my belief that a teacher is there to be a supporter of the student, whether that is presenting new academic material or being a listener to their ideas or concerns. For students to learn effectively, I believe acknowledging students' emotional and social wellbeing helps in setting a supportive environment to develop cognitive skills while also developing knowledge of environmental science.

This drive to connect with environment science students to foster effective learning comes from a curiosity and enjoyment of the outdoors with others. Some of my strongest learning moments have been in the field where teachers could demonstrate how field-based observations were collected, analyzed, and formed into process-based knowledge of the natural environment. I recall during a field-school looking at a river and being tasked with creating a scientific hypothesis to assess water quality and thinking "Where do you even start? There are so many different aspects to consider!". As a teacher, I hear *exactly* the same questions from my students, and now gravitate towards Kolb's Experiential Learning Theory. This allows me to cycle through theory, reflection, conceptualization, and practice to allow the students to develop their critical thinking, create an attainable and testable hypothesis, and form linkages between conceptual theories and actual practice.

These experiences have shaped my teaching philosophy. My ultimate goal is for students to gain specific knowledge of environmental science, to develop different intellectual and transferrable 'tools', and to learn in a supportive and diverse community.

My Teaching Begins with a Sense of Community

Establishing a **sense of community** is essential to facilitating student learning, engagement, and discussion. I experienced this both as a student and teaching assistant during field school, where intensive course work and long hours in the field forms a bond between the students and instructors. However, teaching remotely has rapidly altered the way instructors create that sense of community. When remote teaching was implemented in Fall 2020, I was unaware of the challenges that prevented material from being inclusive and accessible. As this was a priority for my teaching, I sought out teaching modules that aided with the redesign of my course to help establish a teaching presence online, create multiple channels of communication, and use synchronous and asynchronous delivery methods to ensure students had equal access to the learning material. Although different than I first envisioned, this design allowed for higher-level learning during synchronous lectures through verbal discussion, clarification, and reflection of the material. I found that being empathetic, humorous, and honest helped provide a space where students could open up, laugh, and say aloud how difficult a semester of remote classes actually is. These discussions are critical for both student and teacher to build trust, respect, and engage in dialogue.

I use **active-based learning** techniques that connect students with environmental science data to teach science process skills, such as data interpretation, implementing proper sampling techniques, and quantifying error and uncertainty. I utilize open-access databases to *involve* students with relevant

scientific literature, allow students to *interact* with data, form their own hypotheses, and *create* their own data-driven conclusions of the natural environment. For instance, I designed an assignment where students had to locate and download the latest global carbon budget (via the Global Carbon Project database), interpret and 'clean' the database, create a contemporary global carbon cycle, and assess the uncertainty associated with different carbon source and sink models over time. These 'hands-on' learning activities deepens their engagement and learning with the subject.

Communication is a critical skill that I foster throughout my teaching as an important skill for learners to efficiently demonstrate their scientific literacy and understanding of environmental processes. However, different learners have different communication styles. Based on the Multiple Intelligences Theory (Gardner, 2013), I endeavour to allow students to practice their communicative strengths and weaknesses, specifically through developing writing, visualization, and presentation skills to facilitate communication of science-based knowledge through multiple modalities. For instance, I challenged students to summarize three peer-reviewed manuscripts in three different ways – story summary, infographic, and oral presentation. Exposing students to different forms of communication is a crucial skill to identify how they best present information, as well as allowing me to identify how best to assess their progress in understanding.

Teaching is not effective unless you **learn from your students**. If the material is not being presented in a way the student can understand, you lose any form of engagement or interest and erode your sense of community. I believe this can be avoided by informally gauging the level of understanding among the students. I offered anonymous in-class polls and a weekly '3-Point-Summary' for students to reflect on things they enjoyed, disliked, or want improved upon throughout the course. During these '3-Point-Summaries', I often jot the success (or failure) of the material as a form of self reflection of my teaching technique. This has helped me practice different forms of feedback between the students and I, and is an integral part of how my teaching develops over the term to focus on student success.

How I want to Evolve my Teaching in Environmental Science
My teaching in environmental science is constantly evolving to incorporate new field, laboratory, and lecturing methods that focus on student-led learning. Two major areas drive my future teaching style:

  1) We are in a time where scientific learning and collaboration lags behind technology. Scientific writing should shift away from endless *Word* documents titled 'Final_v_{n+1}' towards more efficient workflows that include open data and version control (such as Google Docs and GitHub). I plan to use a constructive alignment in my assignments that exposes students to this technology and develop these skills among early-career individuals.

  2) My research involved a scientific interdisciplinary approach, but I have only recently incorporated different ways of knowledge and learning. My work in the Northwest Territories illustrated the important connection between community and land, the recognition of Indigenous Knowledge, and the role of research scientists as partners in knowledge development with Indigenous communities. I plan to designate time to learn, invite speakers, and include these perspectives from local groups. As part of Canada's path of Truth and Reconciliation, I believe this needs to be a component of every undergraduate environmental science program.

As I continue to learn and teach environmental science, I don't expect my students to stand on their desks at the end of the term (I've seen my fair-share of flimsy working-from-home desks). However, I believe my teaching philosophy will result in scientifically literate and curious learners that have the necessary tools to pursue whatever their interests may be.