Teaching Dossier

Landon J. Getz - PhD Candidate
Department of Microbiology & Immunology - Dalhousie University
5850 College Street, Room 7-C, PO BOX 15000 Halifax, NS B3H 4R2
landon.getz@dal.ca landongetz 0000-0002-3841-1062 landongetz.com | *Updated:* Dec. 10, 2021

Table of Contents

Synopsis

Taking the introductory course in microbiology at Dalhousie University (my undergradaute alma mater) spurred my interest in microbes and their host interactions. Good educators with an excellent grasp on the course material helped me build a life-long love of microbiology. This led to a number of educational opportunities in broad disciplines include Chemistry, Biology, Microbiology, and Ethics, as well as significant research opportunities in these fields as well.

Microbes are quite literally everywhere: on and in our bodies, in the ground and the air, on household and other surfaces, even on Mars rovers (even though we take pain-staking measures to prevent this). And yet we can't see them, and hardly think about what they are doing and how it impacts us. I find it fascinating that the microscopic organisms that are ubiquitous around us, which we simply cannot see without special equipment, are so important for shaping our world. I attempt to use this excitement and interest in microbes to drive home the human dimension of our work as microbiologists – how microbes interact with us and how we interact with microbes in our everyday lives. This has impact on students learning engagement and on how they view my teaching as a result.

As such, the kinds of courses I am interested in teaching integrate the human elements of our science, combining how each of us experiences the world. I believe that these courses, where students feel like they can relate to course material and see themselves reflected within it, are the kinds of courses that create significant and memorable learning. Building laboratory frameworks that allow students to explore (see the at-home laboratory assignment in Summary of Teaching Activies) and course material that allows students to connect what they are learning to their own lives (see the ethics component to Life Rewritten) are some of the ways I accomplish this.

As I understand it, learning is an exercise in growth and an attempt to achieve some completion in our lives. As such I fold a deep sense of care into my classroom environment through strong and inclusive classroom codes of conduct and integrating thorough Justice, Equity, Diversity, and Inclusion (JEDI) principles (see Teaching Philosophy for a more thorough description of this). For this work, I was awarded the President's Graudate Student Teaching Assistant award from Dalhousie University's Centre for Learning and Teaching - the highest honor given to gradaute teachers at Dalhousie University. Further, I attempt to build good citizens through education, linking ocurse material to everyday life and creating critical thinkers that can contribute to our soceity.

I have been an educator in numerous capacities, both traditional lecture style courses, as an educational developer, and through more informal workshops and crash-course style laboratory methods courses. The broadness of my experience gives me a unique perspective when approaching the teaching of traditional lecture style courses, and provides me with expertise in designing activites with a kind of guided independence in mind. The broadness of these experiences has prepared me well to think and move quickly, and this is borne out in the special topics course Life Rewritten (BIOL 3037) that I played an important part in designing (see Summary of Teaching Activities).

This document serves to identify how and why I take these measures in the classroom, and highlight key examples and evidence that my teaching is both effective and excellent. I will begin with an in depth exploration of my teaching philosophy, followed by an outline of the course material I have developed and of Student Ratings of Instruction, through the lens of how they have helped me grow as an educator.

Teaching Philosophy

> "The ultimate goal of farming is not the growing of crops, but the cultivation and perfection of human beings"
>
> — Masanobu Fukuoka, *Farmer and Philosopher*

As an educator, I consider teaching to be like farming. As settlers, both sides of my family have farmed land in Canada they moved onto as part of the colonization of The West. Reflecting on this profession and on my family's experiences has given me significant guidance in my teaching career thus far. In line with how Mr. Fukuoka understands the goals of farming, I believe that education's ultimate goal is the cultivation and perfection of human beings.

Nurturing Students to Grow

To farm the land requires a kind of nurturing that allows plants to flourish. This requires love, passion, and care. Similarly in my teaching career, I have always attempted to create the kind of nurturing spirit required for students to flourish. To me, students who experience real care from instructors for their learning are more willing to engage and more likely to succeed. To demonstrate this care I create classroom codes of conducts that specifically outline, for students, what behaviour is expected of them, and what the recourse is if students need more guidance

about these expectations. These include aspects of respectful behaviour (treat your peers with respect, engage in active listening) and also aspects of creating an inclusive classroom (homophobic, transphobic, racist, and sexist jokes/comments/actions are explicitly prohibited inside the classroom). Creating these respectful environments helps all students feel safe and cared for inside the classroom environment.

Further, caring about student success means creating significant learning experiences for my students[1]. to help develop critical thinking capacities, and cultivates better human beings. Along this vein, I attempt to encourage care and passion in my students by linking their learning outcomes and experiences to both "the human dimension" of the course material and to their personal lives[1]. This can be done in the sciences by considering two key points: that scientists themselves are people (and students can find all aspects of themselves reflected in the scientists of the world) and that science does not exist outside of people – the act of doing science cannot exist without human beings.

To bring this into my classroom, I attempt to link class content with the people who discovered/imagined it and include scientists from diverse backgrounds. This allows a greater array of students to see themselves reflected in science and engage more personally with the content. I also integrate real world issues (i.e. The AIDS crisis as it pertains to the biology of the HIV virus in Introductory Microbiology) into my teaching to help students understand that the act of doing science and learning about it has concrete and palpable consequences. In doing these things, I hope to inspire the passion and care that L. Dee Fink explains helps students create significant learning experiences1.

Experiential Learning

> When I heard the learn'd astronomer,
> When the proofs, the figures, were ranged in columns before me,
> When I was shown the charts and diagrams, to add, divide, and measure them,
> When I sitting heard the astronomer where he lectured with much applause in the lecture-room,
> How soon unaccountable I became tired and sick,
> Till rising and gliding out I wander'd off by myself,
> In the mystical moist night-air, and from time to time,
> Look'd up in perfect silence at the stars.
> — Walt Whitman, Leaves of Grass

Walt Whitman writes about a learn'd astronomer, whose lecture leaves him confused, "tired and sick". However, when he has the opportunity to wander off alone and look up at the stars, suddenly what the learn'd astronomer writes about makes sense, and Whitman understands. Whitman always had a fondness for experiential learning, and this poem strikes an important chord for how we help students in the sciences understand course material and indeed the natural world.

In assessing student's learning outcomes in a course, I encourage and design experiences for students to discover through guided independence, with their own hands, in an experiential way. For an online course in the Microbiology and Immunology department, I have designed an at-home laboratory assignment which expects students to design, plan, and implement a home fermentation experiment. This allows students, even at great distances, to experience the scientific method and the design of an experiment in their own homes and allows me to assess the student's progress on course learning outcomes while allowing them to explore microbiology experientially.

Fostering Belonging

To extend the farming metaphor further, it is well known that strong biodiversity creates more sustainable farming practices[2]. In line with this understanding, I believe that strengthening student belonging in the classroom help students grow into more respectful and responsible people, but also serve them by helping them feel comfortable in the learning environment we create together. To achieve this in our classrooms, I am an open about my own identity as a queer man. As well, I have acted to increase LGBTQ+ visibility broadly by employing various techniques, such as keenly including my pronouns in email signatures and course syllabi, as well as using rainbow flags and pins to signify to my students that they have entered into a safe, welcoming space. For this work, I was recognized with a President's

[1] Fink, L. Dee. Creating Significant Learning Experiences: an Integrated Approach to Designing College Courses. Revised and updated ed., Jossey-Bass, 2013.

[2] https://peifa.ca/efp/; The Prince Edward Island Federation of Agriculture outlines that biodiversity, among other factors, contributes to the "sustainable production of crops and livestock".

Graduate Student Teaching Award from Dalhousie's Centre for Learning and Teaching in 2019. To quote the decision letter: "We commend his work that fosters inclusivity and diversity within the STEM community." Informally, I have also had students tell me that they these efforts do make them feel more comfortable in the spaces we co-occupy.

Additionally, as a settler currently living on Turtle Island, I am beginning to reckon with the history that Settlers have on this land and how Indigenous people were affected by our actions during and after colonization of what we now call Canada. In this reckoning, I have made it a personal mission to incorporate indigenous perspectives into the classroom. During the course design process for BIOL3037 (Life Rewritten), colleagues and I had the unique opportunity to build these perspectives into the course. When discussing environmental ethics, we explicitly make use of indigenous teachings about nature to help illustrate non-anthropocentrism (the idea that nature has value of its own beyond humans). I believe that incorporating indigeneity into my teaching makes me a better educator and helps my students not only see themselves reflected in the teachings, but also to see the diversity of worldviews as it pertains to course material.

Building Social Good through Education

Finally, I believe that good educators not only pass on relevant knowledge, but also cultivate good citizens. It is important – especially in a world where information (true or otherwise) can be so easily shared through social media – that the students we send into the world are engaged and active thinkers. In this way, I spend a considerable amount of time in class relating course material to social issues and concerns. This is especially pertinent when discussing new technologies that will have untold impacts on our future as a culture/society/people. In BIOL3037, Life Rewritten, I was given the opportunity to create lectures and course material for the ethics section of the course. Briefly, Life Rewritten focuses on both the scientific and ethical aspects of new gene editing and synthetic biology technologies. By educating students about foundational ethical theory and the methods by which to apply these theories to the design of new technology, I attempt to provide the background with which to carefully and critically assess these technologies from both the scientific and ethical perspectives. This will ultimately make the students more engaged actors in society on issues that will affect them personally, but also their fellow citizens.

Final Thoughts

It is my understanding that we are all in some way "unfinished" and will be so long as there is something left to learn. It is therefore my personal mission as an educator to help students learn a love of learning and cultivate them to become life-long thinkers and learners. To this end, like the farmer does for plants, I nurture students by creating a safe and respectful classroom environment and by engaging the human dimension of the course content. I have also cultivated a diverse classroom by helping students see themselves reflected in the scientists and the science they are learning about. I have engaged students in the building of a social good, through the creation of environments to explore societal issues through both scientific and ethical lenses. I believe these actions all work towards the fulfillment of my mission.

Summary of Teaching Activities

Historical Perspective and Current Context

As an Undergraduate student at Dalhousie University, I thought it essential to begin sharing my knowledge with other students through Teaching Assistantships. When I began my Doctoral studies at the same institution, I felt it important to further this by applying my experience towards an instructor position.

The courses I have taught previously, in exception of the Introductory Microbiology course, are outside my area of expertise, but were contained within my education as an undergraduate. Both courses, MICI 2100 and CHEM1011/1012, were built by others. My current instructorship with CHEM1011/1012 is a vital part of the team, containing roles as both a lecturer and provider of student support via e-mail and office hours.

Courses Taught

Concepts in Chemistry I (CHEM1011/1021)

The electronic structures of atoms and molecules are used to explain the reactivity and properties of chemicals. Topics include atomic structure, bonding models, structure and shape of molecules and ions, and acid/base chemistry.

Concepts in Chemistry II (CHEM1012/1022)

The principles of thermodynamics and kinetics are used to explain chemical reactivity and the principles of organic chemistry are used to develop an understanding of organic synthesis. Special topics include electrochemistry, spectroscopy, chirality, polymers, and the chemistry of living systems to illustrate the relevance of chemistry in everyday life.

iGEM Wet-lab Bootcamp

During the **i**nternational **G**enetically **E**ngineered **M**achine (iGEM) program, students are required to perform molecular biology experiments in the lab to test their project ideas and build DNA molecules for the competition. This wet-lab "bootcamp", which I designed, built, and instructed, is a weekend long workshop designed to teach the students all the introductory molecular biology skills with hands-on in lab experience.

Introductory Microbiology (MICI2100)

As a teaching assistant for the Introductory Microbiology class at Dalhousie University, it was my responsibility to mark exams, act as a student support via e-mail and in-person meetings during set office-hours, and be a point-of-contact for students.

Microbiology Honours Program (MICI4900)

Supervising an Honours student is a unique experience, which combines both theoretical (lecture-based) learning and applied learning (bench/lab-work). The supervised student worked in the lab on a research question which was designed by me and the lab's Primary Investigator. Supervision included explaining theory, demonstrating techniques, assigning pertinent reading, and assessing student's level of understanding through informal and formal interactions.

Life Rewritten: Applications and Implications of Gene Editing and Synthetic Biology (BIOL3037)

Development of Teaching Materials

As part of my role as both a Part-Time Academic and Teaching Assistant with CHEM1011/1012, I organized and prepared other TA materials to improve the TA's teaching. This included the introduction of Peer-Teaching at TA meetings, along with professional development meetings that are mandatory for Lecture TA teaching support. Professional Development included presentations by the Centre for Learning and Teaching at Dalhousie University, informal discussions among TA's at pre-determined meetings, and discussion on how to incorporate learning styles in the classroom.

Further, I have worked with Dr. Angela Crane (Course Coordinator for CHEM 1011/1012) to incorporate LGBTQ+ positive atmospheres into the course. This included the addition of pronouns to e-mail signatures and to Syllabi, as well as positioning Pride flags in/around the Chemistry Resource Centre. These are vital for the safe and inclusive environments that are required for students to be effective learners.

Efforts to Improve Teaching

Workshops Attended

Learning Styles Workshop
Centre for Learning and Teaching – Chemistry TA Professional Development Program.

Workshops Facilitated

Chemistry Teaching Assistant Professional Development Workshops

Involved in developing and facilitating a CLT workshop session and more informal peer development around learning styles and effective peer teaching. Participation in Peer Consultation Meetings with Dr. Angela Crane Dr. Angela Crane (CHEM 1011/1012 Coordinator) has provided significant feedback in regard to my teaching and professional development. Through a variety of informal meetings, Dr. Crane has had a significant impact on my understanding of student assessment and a variety of learning styles.

Meetings with Dr. Jennifer MacDonald

Dr. Jennifer MacDonald (CHEM 1011/1012 Lab Coordinator) has provided informal feedback on my teaching style and, through informal discussion, provided insight into how students respond to particular questions or assignments. This feedback has influenced the way that I respond to student questions, and the level through which I can understand their frustrations and respond to them in an effective manner.

Professional Development Meetings with CHEM1011/1012 Lecture Support TAs

Informal meetings with Undergraduate and Graduate student Lecture Support Teaching Assistants has helped me empathize with student positions and given me a variety of new perspectives in regard to classroom experiences on the front-lines. In my experience, students of CHEM 1011 and CHEM 1012 are more likely to be open with peer TAs rather than instructors about course experience, and this information can be quite important in modelling teaching styles and course development.

Formal Feedback from Students

Student Ratings of Instruction

Table 1: Student Ratings of Instruction from CHEM 1011/1012 (2018/2019). Report prepared and evaluation facilitated by: Dr. Angela Crane, Senior Instructor

Question	# of Responses	Mode	Median	Mean
The lecturer was well-prepared:	124	5	5	4.47
The lecturer was considerate of students:	124	5	5	4.58
The lecturer was enthusiastic about the material:	124	5	5	4.45
The lecturer was knowledgeable about the material:	124	5	5	4.54
The lecturer was able to explain the materials well:	123	5	5	4.31
The lecturer was a clear communicator:	124	5	5	4.34
The lecturer was able to give constructive feedback:	122	5	5	4.27
The lecturer was overall, an effective teacher:	124	5	5	4.41

Key: 1 = strongly disagree, 2 = moderately agree, 3 = neither agree nor disagree, 4 = moderately agree, 5 = strongly agree.

Selected Student Comments from December 12th, 2018 Evaluation:

([…] indicate sections edited for clarity)
"He wants you to do well as he always answers questions carefully."
"I find that Landon is very effective in teaching the material and help me get prepared for the exam with the review sessions."
"[Landon] did very well, effectively explained his thought process and answered questions when they arose."
"Sometimes his writing is unclear on the slides making it difficult to read. [He] does a very good job of explaining what he is doing for the students to understand."
"Great instructor, it's really easy to understand your explanations and answers to questions. [Landon] could be more assertive towards students who talk loudly in class. [He] would be a great professor!"
"Occasionally went over problems to quickly but would gladly go back and explain if students asked.
"Notes can be hard to follow at times [when drawn live]. It would be useful if you numbered the steps."

Response to Evaluation:

Overall, these evaluations indicate to me that my approach to teaching is effective but has room for improvement. I will improve the organization of lecture slides and the delivery of these lectures. In particular it will be important that I work on the speed of my delivery and the clarity of the live, handwritten sections of the lecture slides that are done using a writing pen and tablet along with the lecture presentation. Alternatively, I can also consider removing the live, written sections as this seems to be a major area of confusion and concern for my students.

Service to Teaching

Department of Microbiology and Immunology Undergraduate Studies Committee

This committee is responsible for the curriculum and operation of the Microbiology and Immunology undergraduate Bachelor of Science degree program. My role on the committee is as Graduate Student Representative, relaying concerns about the undergraduate program from undergraduate and graduate students to the largely Faculty-composed committee. As an alumnus of the Microbiology and Immunology Undergraduate program, I am in a unique position to provide feedback to this Committee.

Future Teaching Goals

I am proud to continue improving my teaching through continued student feedback, professional development workshops, and teaching experience. This will include enrollment in the Centre for Learning and Teaching's Certificate in University Teaching and Learning (Graduate Students).

I am working with Dr. John Rohde on course development for a course titled, "Tiny Earth". It combines lecture and lab techniques to generate data and publish it with the Tiny Earth initiative (more information at: https://tinyearth.wisc.edu/). The development of this course focuses heavily on active learning and was awarded an active learning grant through the 2018-19 active learning project funding.

Finally, Higher Education is a passion of mine, and I intend to pursue teaching throughout my life. As I combine my past experiences with the opportunities I will pursue in the future, I will be well positioned to do this.