President’s Teaching and Learning Scholars (PTLS) Grant Report

Synergistic application of Western and Indigenous knowledge to understanding medicinal plants.

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The Course
We received the PTLS grant in 2011 and taught our first offering of our web-based course (BIOC 200: Medicinal Plants and Culture) during the spring of 2013. This online course is quite unique because it is taught by a Biochemist (Dr. Dahms), a Food Scientist/Ethnobotanist (Dr. Pontes-Ferreira), and a Biologist (Dr. Gendron) at the University of Regina (UofR), Wayne State University (WSU) and First Nations University of Canada (FNUniv), respectively. As instructors, we have always been interested in teaching a course on medicinal plants but felt that the contribution of other disciplines would strengthen the course. It was also natural for us to include Elders in the project as it brings a rich knowledge base and an important cultural component to the course.

We organized the course into sections centered on plant families. Pontes-Ferreira and Gendron provided an introduction to these families (structures, biology, nutritional value, etc…) while Dr. Dahms explored the medicinal components of these plants through study cases. A challenge was to offer scientific information to students having a variety of educational backgrounds and to weave the content together into a coherent class. Each instructor is responsible for two forum discussions and different sections of paper assignments, which allows students to interact with each instructor and learn from their different expertise. To highlight the traditional component, we did a medicine walk with Elder Betty McKenna and Nelly Ironquill in 2013 to which the students were invited. The field trip was filmed and is now available as an educational tool for students as part of the online class. The Elders also graciously agreed to talk about specific plants that we covered in the course and explain their cultural use and importance, which was also filmed as part of our online course content. In 2014, students who were on campus participated in a workshop in the medicine room at the First Nations University of Canada with Elder Betty McKenna. We believe this course highlights both scientific knowledge and traditional knowledge.

The Research Questions
With the offering of this course, we were interested in investigating the following questions:

1. Does the blending of Indigenous and Western knowledge provide a more holistic understanding of medicinal plants, not otherwise accessible?
2. What are the perceptions of students regarding multidisciplinary team teaching and the quality of their learning experience?
3. Does multidisciplinary team teaching provide instructors with new and effective ways of teaching and knowing?
Along with these research questions, Pontes-Ferreira received a grant from the American Association for the Advancement of Science (AAAS) and we initiated a research project that examined these questions:

4. What is the impact of traditional Elders as co-educators on student interest in STEM?
5. What are student perceptions of traditional Elders as STEM co-educators?
6. Do students identify as scientists following this class?

Methods and Results
Ethics approvals for the quantitative and qualitative studies were obtained from WSU and UofR.

Ph. D. candidate Sarah Alkholy, a student of Pontes-Ferreira at Wayne State led the quantitative assessment as part of her Ph. D. thesis research, which she has now successfully completed. Sarah created a pre- and post-class survey, with feedback from Dahms, Pontes-Ferreira and Gendron who also supplied her with content-related questions that allowed her to assess class progress throughout. In 2013 Dr. Alkholy found that Canadian students showed a stronger trend towards believing that traditional Elders are appropriate as post-secondary STEM co-educators as compared to US students (Alkholy et al., in press). Combing the 2013 and 2014 data, she found that Canadian students taught with Elders reported significantly greater interest in STEM than did their US counterparts taught without Elders (Alkholy et al., under review).

Dahms began to explore the idea of the application qualitative research to gain a richer understanding of course delivery outcomes of our unique course offering. “Qualitative research is a situated activity that locates the observer in the world, providing an interpretive, naturalistic approach to the world. Such an approach also alters the gaze so participants are not objectified ... making an attempt to interpret phenomena in the context of meanings” (Denzin and Lincoln, 2011). We were highly fortunate that Audrey Aamodt, Ph. D. candidate in the Faculty of Education at the University of Regina, was interested in our project. She has an M. Ed. in online education, describes herself as a settler becoming unsettled and wonders how her research practice can become a decolonizing experience, a perfect fit to our questions.

Following initial discussions with Dahms and Gendron, Audrey proposed a qualitative mixed method approach, including critical theory with post-structural perspectives, a phenomenological interview design that considered indigenous methodology to create a storied perspective. Audrey has given one presentation of her work as part of a joint presentation with Dahms and Gendron at the COHERE conference (http://www.slideshare.net/COHERE2012/what-it-is-like-to-be-a-student-in-an-online-stem-course-audrey-aamodt-fidji-gendron-tayna-dahms) in Regina this year and she will disseminate her work later this year in a peer-reviewed, wide readership journal.

In terms of the class delivery, Audrey’s analysis so far speaks to the “tension of time in online spaces”, including student self-organization and motivation, the pace of a compressed class. Their experience with multiple instructors was relatively seamless such that “each did their own part ... It didn’t just feel as though I had 3 profs. It felt like I had one”, with students perceiving excellent “flow” in the class. They enjoyed that they had “more options for learning... finding teaching styles that apply to you, not being “stuck” with one”. They appreciated that there were three assignments, each led by a different
professor: “for me, easier to deal with one person [for assignments]”, but that three of us provided “broader learning... bring different things to the table” and said, “I really liked the different perspectives that they had”.

In relation to the online landscape, they thought it was “refreshing to have... then you weren’t stuck with the same mode of lecture and same vocal patterns and it made you think more”. The students found the class highly accessible, saying “everything was very accessible. The videos they put up were great...” and “I loved the audio PDFs. I wished there were more of those... [they] were more interesting & easier to go back to than PPTs”. “It was very balanced and very accessible” and as a result of the medicine walk videos and conversational forums, they thought “this class was a lot more inviting... more hands on”.

Excitingly, the students had many reflections on Elder gifts, stating that “the most powerful [aspect of the course] for me was the medicine walk videos”, “I feel like she brought it all together”. One student reflected that “another perspective that sits with you really well, and it kind of makes you think about things from another side so that you can be more understanding ... I think it is all about changing your perspective...”. Some students perceived the ancestral, visceral knowledge imparted by Elder Betty: “I thought [the Elders were] so cool... It’s not coming from a science perspective anymore [but] from someone who has a deep, a different type of, a deep knowledge...”. “The videos were insightful. I could definitely tell it would be better to be there to learn, walking with them; showed the respect the elders treat our daily body with. How we take care of our body. You don’t abuse the land. And that’s alright with me.” As a result of merging the disciplines, the bicultural approach did not seem to be leap for students: “since we find all these disciplines merging together it’s not really outside of the scope to bring in traditional uses and how perhaps cultures in the past found uses for molecules”.

Thus, both our quantitative and qualitative data shows how mainstream students having access to Traditional Indigenous Knowledge see this as a key opportunity for learning Western Science content. However, there is a cautionary tale, as “key issues of concern and debate are rising in the literature such as examining the similarities and differences between Traditional Ecological Knowledge (TEK) and Western Science... and whether blending or integration can actually be achieved in a Western framework without misappropriating Indigenous knowledge” (Lowan-Trudeau, 2013).


As a follow up this spring, Alkholy will explore the question: Does multidisciplinary team teaching provide instructors with new and effective ways of teaching and knowing? She will send questionnaires to and will interview us, the co-educators, and Elder Betty McKenna to document our teaching experience.
Peer-reviewed Publications (students in bold)
Our research group has published one paper and participated in several conferences.


Conference Presentations (*presenters)


