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Weaving Indigenous and Western Science Knowledges Through a Land-Based Field Course at Bkejwanong Territory (Laurentian Great Lakes)

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ABSTRACT In response to a growing interest in building Indigenous-led educational experiences, we codeveloped a land-based field course that wove Indigenous ways of knowing together with Western ecological concepts. The spirit of the course was the one rooted in varied ways of knowing nature, on the land, the water, and the culture—to see the Great Lakes from an Anishinaabe perspective. Situated in the heart of the Laurentian Great Lakes Basin at Bkejwanong Territory (Walpole Island First Nation), in the Traditional Territory of the Three Fires Confederacy of First Nations (Ojibwe, Odawa, and Potawatomi) on Turtle Island (North America), this inaugural undergraduate university course was led by an Indigenous instructor with contributions from non-Indigenous science faculty from the university and local community knowledge keepers. Here, we describe our journey in cocreating land-based teaching modules with Indigenous scholars and scholars at the University of Windsor, Ontario, Canada. We focused on experiences that exposed students to traditional ways of knowing nature, and reflections were used as the main teaching pedagogy. The course offered daily perspectives and activities across land and water and examined dimensions of biodiversity as sacred beings and medicine. Outcomes and indicators of success were driven by the individual's reflection and evaluation on their own growth, as expressed through a final project aimed at bridging knowledges, supporting community initiatives or both. This case is designed to offer an example that has potential for application to many other contexts where community-faculty partnerships and land-based learning opportunities are available. **KEYWORDS** field course, land-based learning, partnership, learning, teaching, environment, education, ecology, Indigenous ways of knowing nature

INTRODUCTION

The Healthy Headwaters Lab at the University of Windsor, Ontario, Canada, recognizes the importance and value of reciprocal relationships between Indigenous peoples, place, and the water. We seek to strengthen teaching and holistic research with a critical part being community-led projects at these critical nexuses. Our journey in research and teaching is not linear but circular and integrative of multiple ways of knowing. In the circle, we are all equal, we invite and honor diverse perspectives, actively listen, and—with self-awareness, in our own time—we reflect. Building on efforts, both internal and external to the university, to decolonize and Indigenize traditionally colonial academic spaces, and using the

Truth and Reconciliation Commission (TRC) Calls to Action and Universities Canada 13 Principles on Indigenous education as a guide, we set out on a journey together with our partners at Bkejwanong Territory (Walpole Island First Nation) to create space for Indigenous voices and knowledge keepers to help teach the next generation. Together, we sought to create opportunities that explore science within and beyond the university system that is relevant to and representative of First Nations communities, values Indigenous Ways of Knowing, and incorporates Indigenous pedagogies.

In 2015, the TRC published 94 Calls to Action urging all Canadians to contribute to the reconciliation process. Included with these calls were recommendations relevant

to higher education for Indigenous students and to academic institutions and research [1]. Notably, we specifically acknowledge Calls 62, 63, and 65:

62. We call upon the federal, provincial, and territorial governments in consultation and collaboration with survivors, Aboriginal peoples, and educators to provide the necessary funding to postsecondary institutions to educate teachers on how to integrate Indigenous knowledge and teaching methods into classrooms.
63. We call upon the Council of Ministers of Education, Canada, to maintain an annual commitment to Aboriginal education issues including the following:
 - i. developing and implementing Kindergarten to Grade 12 curriculum and learning resources on Aboriginal peoples in Canadian history and the history and legacy of residential schools;
 - ii. sharing information and best practices on teaching curriculum related to residential schools and Aboriginal history;
 - iii. building student capacity for intercultural understanding, empathy, and mutual respect; and
 - iv. identifying teacher-training needs relating to the above.
65. We call upon the federal government, through the Social Sciences and Humanities Research Council, and in collaboration with Aboriginal peoples, postsecondary institutions and educators, and the National Centre for Truth and Reconciliation and its partner institutions to establish a national research program with multiyear funding to advance the understanding of reconciliation.

We are all Treaty people who share responsibility in building a better, more inclusive future. Academic institutions, educators, and scholars, both Indigenous and non-Indigenous, are uniquely situated to bring about meaningful change. This includes building and strengthening relationships with local Indigenous rights-holders and communities; incorporating Indigenous history, culture, and pedagogy into the curriculum; and reimagining opportunities for Nature-based education. Indigenous knowledge systems can expand our understanding of

conservation and ecology and guide learners toward a deeper connection to all of creation. Finding ways to connect with nature through the lens of Indigenous knowledge systems offers a path for students to relearn history and understand the impacts of colonization.

“All our relations” refers to the belief that everything has Spirit, a place in creation, and is interconnected. We can experience this through humility and respect, two of the grandfather teachings. We can further see these connections through language. The Ojibwe or Anishinaabe language is active, it has life. One example is the word for a prairie: Mshkode, which translates to “where the fire has come through.” This refers to our relationship to this place. As scientists, a wall often separates you from what you observe. In Traditional Ecological Knowledge (TEK), we see our role in creation. The tallgrass prairie is a story of reciprocity whereby its survival was dependent on the intentional setting of fires, and in turn it provided food, shelter, medicine, and more. Restoring this relationship is one way that TEK is being acknowledged in conservation efforts both locally and abroad.

Here, we offer our insights into an Indigenous-university collaboration that resulted in the codevelopment of an undergraduate field course. The course was developed for those enrolled in biological, ecological, and environmental disciplines and employed the term TEK to capture the complex ways of knowing nature guided through an Indigenous lens. We describe the general framework, focusing on centering the students’ experience, their sense of place and connection to Nature, and in sharing various dimensions of Anishinaabeg relationships with the land. We describe how traditional field course elements were guided through an Indigenous lens and woven with Western concepts related to biology and environmental education. The purpose of this offering is to share the experiences and lessons learned while also inviting others to consider how offerings may be codeveloped and delivered elsewhere across Turtle Island (North America) and beyond.

LAND-BASED LEARNING: LAUNCH OF A FIELD COURSE

Context Setting: The Coauthors and the Anishinaabeg Worldview

The authors of this work are Indigenous (Anishinaabe; C. Donaldson, T. Day, C. Jacobs, K. Keeshig) and non-Indigenous (C. Febria, J. T. Ives). We share a vision of being good stewards and guests of the land, respectively

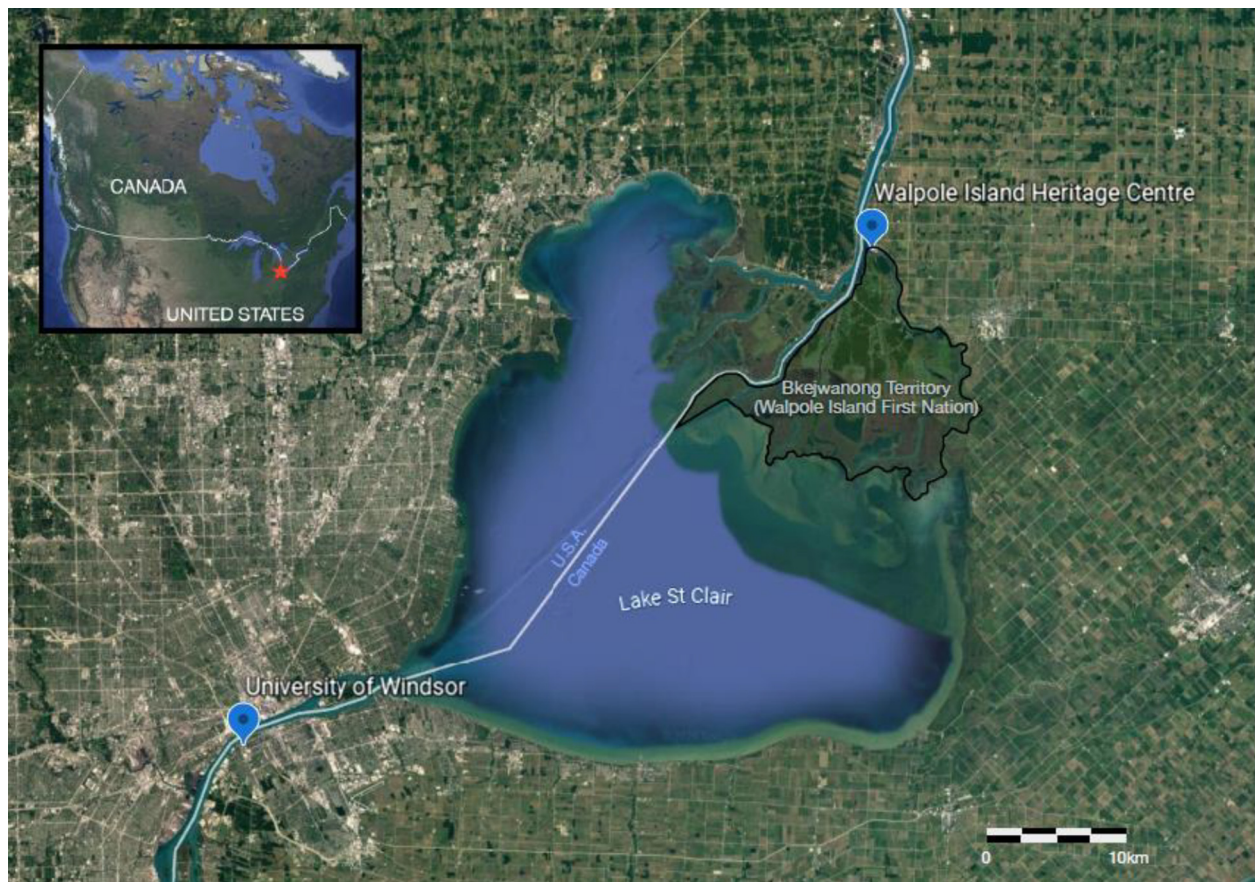


FIGURE 1. Map of Bkejwanong Territory/Walpole Island First Nation, indicating the location of the Walpole Island Heritage Centre and surrounding area where much of the field course took place.

[2], engaging in conservation, restoration, and empowerment of the next generation. Central to this vision is the opportunity to provide culturally responsive pathways for learning, self-reflection, relationship building, and land-based teaching as part of a collaborative approach to education. The effort described here was rooted in the Anishinaabeg worldview whereby all parts of creation are equal and valued, and knowledge is inseparable from our connection to place and creation. With that understanding comes responsibilities to care for and honor creation. The importance of place was a repeating thread through all aspects of course development and delivery. Thus, the authors acknowledge their connection to the Great Lakes Basin and in particular Bkejwanong Territory on Lake St. Clair, the center, or heart, of the Laurentian Great Lakes (figure 1).

Context Setting: Bkejwanong Territory, the Heart of the Laurentian Great Lakes

Bkejwanong Territory or Walpole Island First Nation is situated on Turtle Island (North America) in the heart of

the Laurentian Great Lakes (herein referred to as Bkejwanong). Bkejwanong is unceded land and the Walpole Island Heritage Centre (NinDaWaabJig) served as the central classroom for the course, with much of the hands-on learning taking place across Bkejwanong's varied habitats. Bkejwanong has over 70 plant and animal species that are listed as endangered, threatened, or special concern by the Committee on the Status of Endangered Wildlife in Canada [3]. Bkejwanong is home to a high diversity of species and is often referred to as the Nation's medicine chest with its incredible diversity of plant life. Located at the doorstep of the St. Clair River delta, natural habitats include the river and channels, wetlands, tallgrass prairies, oak savannas, and forests. As the traditional territory of the Three Fires Confederacy of First Nations, the Ojibwe, Odawa, and Potawatomi, generations of Knowledge Keepers have a deep understanding of the habitats' relationships and gifts that provide food, water, and cultural benefits. As a community, Bkejwanong has acted to maintain respect for, and continued

beneficial dependency upon, the environment. Bkejwanong endeavors to coexist with Mother Nature and protect this relationship, and the community pledges to use resources to the mutual benefit of all peoples and ensure proper respect for all things. Part of this effort includes the Walpole Island Heritage Centre (NinDaWaabJig) founded in 1989. NinDaWaabJig's priorities include stewardship of healthy plants and animals, restoration of language and culture, ecosystem conservation and recovery, research and building capacity, improved connections between people and ecosystems, stewardship and traditional habitat management, and community to be educated, aware and involved.

Navigating Institutional Structures and the Course Development Process

Prompted by the TRC's Calls to Action (2015), Canadian postsecondary institutions are struggling with how to ethically engage Indigenous communities and knowledge systems [4]. Communities, scholars, and administrators want better relationships but are faced with the challenging task of realizing these aspirations within a university culture that is still largely invested in Indigenous erasure and marginalization. Conceptually, indigenization represents a move to expand academia's still-narrow conceptions of knowledge to center Indigenous knowledge and experiences in transformative ways [4]. In our journey, it was clear that authentic, early, and ongoing immersion with Indigenous partners and community was necessary. One outcome was to commit to developing a course that highlighted TEK and cultural awareness to provide an interactive example for all through a lived, land-based experience.

Course development was preceded by years of relationship building between the University of Windsor and members of the Bkejwanong community, primarily led by author C. Jacobs. Through both formal and informal avenues, a trust-based partnership was formed that focused on undergraduate teaching and research opportunities. These relationship-building efforts included retreats at NinDaWaabJig and visits to key natural sites across Bkejwanong and to various university research facilities. A clear priority was the codevelopment of an Indigenous-led and co-designed land-based course centering Indigenous ways of knowing nature alongside Western scientific field-sampling methods and ecological concepts. Most importantly, the course would

encourage all involved (students, instructors, and community) to focus on their own relationship with nature and engage learners in diverse ways of understanding biodiversity, ecosystems, and communities. The course sought to foster those connections and deepen understanding through a multiday immersion at Bkejwanong. Outcomes would be learner-driven and informed through a reciprocal process between the learner, knowledge keepers, and the land. Students would engage in self-assessment of their own growing understanding through individual and group activities, which is consistent with growing scholarship on integrating approaches in science, technology, engineering, and math education [5] as well as TEK as a collaborative concept [6] and mutualistic relationship [7, 8].

A critical desired outcome from the course was strengthened understanding of nature, for both student and teacher, from multiple perspectives, including their own. All non-Indigenous participants would learn from the perspective of being good guests looking to build personal connections, confidence, and competence when working with Indigenous rights-holders and on traditional lands. This was the university's first formal offering of Indigenous knowledge in the Faculty of Science. Course co-organizers understood that in participating in the course, they were guests on the land and that knowledge shared (e.g., TEK) was a privilege in and of itself. Only Indigenous elders and community members were entrusted to share TEK in their own modality, voice, and determination. Non-Indigenous co-instructors engaged in the course through the delivery of modules that complemented TEK concepts. Modules included mapmaking, ecological monitoring, and habitat restoration activities and provided examples of collaborative research partnerships weaving TEK into research underway across Bkejwanong (table 1).

The Medicine Wheel as a Guiding Framework for the Course

It was important for the course to model holism and embedded a sense of responsibility in transferring knowledge to students. Whereas Western science approaches often separate self from nature, the course sought to do the opposite. We engaged students to think holistically, and one teaching element was the Medicine Wheel (figure 2). In Anishinaabeg (and other Indigenous) culture, the Medicine Wheel contains traditional teachings that can

TABLE 1. Daily Module Topics and Reflection Prompts for Students to Explore.

Topics	Description	Reflection Prompts
Prefield introductory session	A session held before the field component of the course, which included cultural awareness training, course expectations, and logistics.	What led you to this Indigenous field course? What does Indigenization mean? What do you hope to understand after completing the course?
Reconciliation and cultural awareness	Students are introduced to the history of Walpole Island and the relationship with Canada, legislations, the Indian Act. By exploring what reconciliation means to Indigenous people, the students get their first experience with how perspective shapes a story, knowledge, and science.	What is reconciliation to you? What does it look like to you? How would you do it?
Geology and landscape of Walpole’s Delta Islands	Participants studied the local landforms and learned the geological history of the Great Lakes focusing on the Walpole Island Delta. Students were introduced to the workings of satellites for GPS using an interactive demonstration. Students were required to define the border of an Oak Savanna using geographic information systems (GIS) and drones.	How did perspective on place change after doing the mapping activity? What is the role of boundaries, real or imaginary? How did this activity introduce you or change your perceptions on perspectives and how that change your scientific approaches?
Water, wetlands, and the First Nations	Water sustains all living things, so it is important for scientists to know and understand the water cycle and water quality. Wetlands are important in keeping our water clean and in preventing erosion and flooding. Students learned what biomonitoring is and how it is approached in different environments and when it is targeting different species and data. Biomonitoring took place in the Bush Marsh using provincial macroinvertebrate standards and on the beach, seining, for a fish grab.	What is the role of biomonitoring in restoration projects in cultural spaces and places? How are sensitive taxa and species at risk linked to restoration and conservation efforts, people, and this place?
Biodiversity and globalization	Students were introduced to the importance of native species, especially trees to the biodiversity of an ecosystem. The example given compared a native oak feeding up to 500 different species to an English oak that feeds 4. Also considered was the threat of invasive species that are harder to control in a globalized market. Terrestrial ecology techniques including the biodiversity of trees, plants, insects, and other invertebrates—sampled, plotted, and mapped.	What were some of your takeaways from the impact of globalization on forest ecosystems?
Flora of the savanna and prairies	Ethnobotany was introduced and used to explore and identify species of plants using family keys and characteristics including the Indigenous language, Anishinaabe teachings, stories, remedies, and recipes. Included was a history of Mshkode—the Prairie—meaning “where the fire went through” in Anishinaabemowin.	What is the role of invasive species and climate change on systems like tallgrass prairies? What did you feel/think/hear during the quiet reflection time in the prairies?
Birds: Walpole Island Purple Martin Project (WIPMP)	Visiting St. Anne Island, students learned how to identify Purple Martins birds by shape, color, bill shape and size, their songs and their habitats (apartments), and their cultural significance to Indigenous people and their reciprocal relationship. They assisted in maintaining the apartments, removing invasive nesters, and collecting data for the WIPMP.	What did you learn about symbiosis and connections between nature (e.g., Purple Martins) and humans?
Braiding sweetgrass	Elder shared the importance of the four directions, the corresponding sacred medicines—focusing on sweetgrass. Students braided the sweetgrass as a representation on the weaving of our two knowledge systems along with the thread of hope, peace, and friendship for our shared journey.	Braiding sweetgrass and knowledge systems—what were your reflections on weaving your learning and lived experience with Bkejwanong Territory and the Heritage Centre’s teachings?

Note: Local context and history were important for engaging students in the sense of place and should be carefully considered in other institutions and locations.



FIGURE 2. The Medicine Wheel adapted by the co-instructors to be used as a guiding framework for the course.

be used as a guide on any journey (e.g., FourDirectionsTeachings.com [9]). The Medicine Wheel, comprising four quadrants, teaches of interrelatedness, interconnectedness, wholeness, and balance and is fundamental in Anishinaabe learning [10, 11]. The number four has many significant meanings, including the four directions, four sacred medicines, four seasons, four stages of life and learning, four aspects of health, and four major divisions of creatures. Thus, as echoed through other land-based efforts [8, 12], the lesson for the students was not just content but the process through which they learned. In Anishinaabeg teachings, knowledge is often transferred through story or metaphor. Rarely are lessons straightforward, obvious, or one-dimensional but rather encourage the learner to approach everything holistically, to listen, observe, and consider the process, connection, and meaning of things. If any part of any system is unbalanced or ignored, the whole is incomplete. TEK encourages us to look at the whole of everything.

TEK Through Local Context and Experiential Learning

Indigenous instructors emphasized the importance of a local context (i.e., sense of place) and connections between humans and nature. Contrary to the Western science approach, where the individual is distanced from the scientific method, TEK was shown to be a different but complementary way of understanding nature. The practicalities of research and Western science were valued and guided our modules, but the course added the lens of connection. You are not only the observer—collecting, storing, and organizing all these little stories from Earth; you are part and parcel. This cannot be taught, the way that you cannot truly be taught to meditate or pray, it must be experienced, with time and guidance, and always in place.

Students were shown that across this context and across many Indigenous cultures, there is a direct, personal relationship with the earth and all formations, life, and spirit. Indigenous knowledge holders shared that they are part of

creation and that recognizing the signs and songs is a privilege that develops into a gift. From sharing meals together, listening circles, and numerous activities on the land and water, students related to Bkejwanong through their own lived experiences with Anishinaabeg culture and traditions.

Course Design

The course design reflected multiple objectives, including a desire to build a greater awareness of Indigenous histories, realities, culture, and pedagogy, create a decolonial approach to science education, and foster connections between the university and the traditional keepers of the land on which the university sits, between Indigenous and non-Indigenous students and their wider communities and among knowledge holders (science professors and staff, Elders, guides, and youth). Most importantly, the course was designed to engage students in place-based education that centered reciprocal relationships with Nature. In addition, the course intended to provide students with field skills necessary for conducting environmental or ecological field work. By design, the course connected students with Indigenous knowledge keepers and non-Indigenous scholars together. We centered the course delivery on the land and layered in Western field methods in a way that built upon Anishinaabeg teachings on culture and sustainability. This approach decentralized the teaching away from formal instructors but focused on the land through exploration of Bkejwanong's flora and fauna and teachings from community members. Learning outcomes included habitat and species identification, field sampling methods, understanding of Anishinaabeg culture, language and storytelling, and an understanding of reciprocal relationships with self, others, and nature.

The course was divided into three components: pre-field coursework, field-based coursework, and a final gathering. Instructors recognized that individuals were at different places in their journey toward cultural awareness of Indigenous peoples and history in the region and thus provided a range of online resources in the form of readings and videos before the course to allow students' time to individually reflect and prepare.

PREFIELD COURSEWORK. The course began with an introductory session, including cultural awareness training and discussion, course expectations, and logistics. Starting by sitting in a circle, all participants began to get to know one another and build trust. The introductory session was intended to ensure that students understood how to be

good guests on Indigenous lands. The message shared by the Indigenous knowledge holders present was:

Respectfully, if we hope to learn from another culture, we want to come to the relationship knowing our shared history, with some understanding of who the people are, the language, the treaties and how colonialism and the Canadian government disrupted and affected that culture (C. Jacobs).

Students completed a precourse survey to allow instructors to begin to get to know the students and their previous experience with Indigenous communities and TEK (Appendix A). Students explored their own self-awareness through personal reflections in the form of a written journal or field notebook (table 1). Students were encouraged to begin thinking about the development of a final project connected to any of the topics covered throughout the field course. Students were encouraged to identify a topic that connected Western science, TEK, Bkejwanong habitats visited, and/or the local community. Topics could be developed and refined throughout the week with feedback from the lead co-instructors (C. Jacobs, C. Febria).

FIELD-BASED COURSEWORK.

Let us meet the land, the place, Bkejwanong, meaning "where the waters divide." Many know Bkejwanong as Walpole Island, a delta of six islands that are made up of five major habitats: tallgrass prairie, oak savanna, Carolinian forest, wetlands, and open-water aquatics. As scientists these habitats and ecosystems are a dream to visit and study, traditionally referred to as "our nation's medicine chest" it is blessed with traditional sacred plants, now endangered species (C. Jacobs).

In June 2019, the field course component took place at Bkejwanong. Students and nonresidents of Walpole Island camped nearby and entered the island daily. Each day began and ended with a sharing circle where all voices were equal and there was no judgment, in keeping with the local custom and tradition. The group met elders and instructors for the day and proceeded with the scheduled module. Each evening, the group was welcomed with a meal and more sharing from community members, facilitated by co-instructor C. Jacobs. Each day would begin and end with a prayer of gratitude—Miigwech—and a chance for all to share their reflections.

In this way, each day followed a similar rhythm. Course content was delivered as general scientific modules

(e.g., biodiversity, maps, water) that could also be conveyed through TEK, each led by different university-based instructors and elders or community members (table 1). Field activities were organized around modules and included identifying plant species, drone training, mapping both species at risk and invasive species, assisting with the care of purple martin nesting colonies, and performing aquatic wildlife surveys. The technical field activities were complemented by cultural awareness sessions, history of the clans, personal stories of the residential school system, and a community language event. Throughout the course, participants were provided time for periods of reflection and fellowship. On one morning, students were asked to draw a map based on their sense of place in relation to the water, trees, and animals and route taken to Bkejwanong. This was then followed by the mapping module, which reinforced how relating to other beings is essential in both Indigenous and Western approaches to mapping. In another activity, students hiked through an oak savanna forest and recently burned prairie. After a period of guided reflection by Instructor C. Jacobs, students were encouraged to engage in ecological monitoring with community members and draw on their senses to help find rare and endangered plants. Students were able to identify various species at risk across the prairie and, to great surprise and delight, on the trail back to the start of the hike. Students expressed surprise in realizing that the plants were there the whole time, but they did not observe with their full senses when they first arrived. In another module, students participated in biodiversity monitoring activities to identify fish and invertebrates in a local wetland and waterway during the day, then engaged in storytelling by community members on the Anishinaabe clan system, which related animals to traditional teachings, occupations, roles, and responsibilities essential to Anishinaabe society.

Reflection

Personal narratives framed many of the course teachings, and reflections were the primary medium of learning assessment using a range of formats (e.g., journaling, note-taking, video). Upon arriving, while sharing a meal, Co-instructor C. Jacobs shared a story about his grandmother's teachings and reminder to "listen and be patient." This set the theme of the week, and the primary methodology through which knowledge would be revealed to the learner. Thus, to be

good guests, students were reminded to come to the course ready to actively listen, to be patient, and to reflect.

Community

The experience of working with, and being immersed in, local traditions was another intentional element of the course and place-based learning [13]. Eating meals provided from the island by local caterers and sharing the meal all together were integral to the experience and helped foster relationships and connections to the community. To share meals and teachings together is another important aspect of Anishinaabeg culture. In this way, you feed both the spirit and body with knowledge and sustenance. It also offers opportunities for silent reflection, trust building, reciprocity, and gratitude.

STUDENT ASSESSMENT. Individual student assessments were broken down into a final project (25%), field work (40%), a field notebook (10%), and personal reflections journal (25%). Assessment of field work was evenly split among four overarching topics: habitats and species (10%), field mapping and assessing habitats (10%), birds and grasslands (10%), and freshwater biodiversity and water quality (10%). The field notebook comprised individual worksheets that reflected methodologies taught for measuring and capturing biodiversity, geography, and environmental data. Students had the option of completing their final project individually or part of a group.

Individual reflections were an important thread connecting the course topics and cultural sessions, allowing students to supplement and build on the individual lessons to craft a more holistic understanding. Reflections were submitted in two forms: (1) a personal written reflection of their journey as a whole and (2) a photo journal of 10 individual moments. To guide personal reflection, a prompt question or theme was offered daily (table 1), and students were encouraged to include photos, videos, and any other creative expressions as part of their journal entries. Students were given time to work on these reflections daily and were often encouraged to capture thoughts, questions, and insights throughout the day. For the photo journal, students were asked to photograph individual moments and compile 10 favorite moments alongside simple caption. The photos were displayed at the final gathering and used with permission to showcase the course. On the last day of the field component, students submitted their field notebook, whereas the journal

and photo journal submissions were submitted onto the course website 2 weeks later.

FINAL GATHERING AND POSTGATHERING REFLECTIONS. Reflecting on the learning outcomes related to understanding the rich biodiversity and habitats across Bkejwanong, a deepened understanding of Anishinaabeg culture and relationships to the land, students were evaluated on their ability to weave the various knowledges together through the exploration of their personal and collective experiences. To bring the course to a close, 1 month after the field component ended, all course participants and community members were invited to meet at the University of Windsor to share a meal and present their finalized reflections, photo journals, and final projects. Students were asked to submit a brief write-up where they explained their rationale for their final project topic and the nature of their final output. Final projects were as diverse as the topics and individuals featured in the course, and all had an intended direct benefit for the Bkejwanong community. For example, students created cages to protect local turtle nests, pamphlets and educational information for local conservation groups, a review on the symbolisms and teachings of the Medicine Wheel, and a short video describing the course (YouTube: <https://tinyurl.com/tek-fieldcourse-2019>). This final meeting as part of the course was also shared as a new start for all those involved to see themselves as part of a bigger fellowship and community linking the university and traditional territory of Indigenous rights-holders. Bringing the course to a close in this way reinforced the concept of the Medicine Wheel as a framework and an effort to model holism and embed a sense of responsibility and fellowship with all who engaged in the course.

THE PROCESS AS PROGRESS: WHAT DID WE LEARN?

Following the example of many Indigenous cultures, the process of building a relationship in and of itself was progress [14] and the most successful outcome of the course. From that lens, the course was viewed as a success for both the university and Bkejwanong participants. Many lessons were learned by course cocreators. Commitments were made by the university to continue incorporating and supporting Indigenous ways of knowing in university course offerings. We have since used the template of the course to develop additional resources to

enhance future offerings and elements that can be applied to other courses across the arts and sciences. As a tangible outcome, in part from the ongoing relationship-building efforts that led to this course, a new category of faculty member was created and approved by the Senate: adjunct Indigenous scholar. Co-author C. Jacobs was the inaugural person to be nominated in this role. The course will continue to be offered while it is of interest to the Bkejwanong community, with ongoing discussions on how to nurture the partnership and commitment to learning over time. The flexible design of the course, as individual topics that together make up a whole course, will continue to develop over time. Outcomes of various student projects continue to be used by the communities.

The success of the course will ultimately be determined by the individual learner and by the community at Bkejwanong. Emphasis was placed on individual relationships with nature and to help support growing awareness of how Indigenous ways of knowing nature are all encompassing, complimentary to Western science, and can increase our understanding of sustainable coexistence with nature. Indigenous knowledge keepers encouraged learners to engage with all senses, including the heart. Given the current and future threats and stressors placed on Bkejwanong's habitats, the instructors hoped to demonstrate that reconciliation and restoration of the lands are only possible when individual connections with the land are healed and restored. One benefit of this partnership with the University and a land-based course across the traditional territory was the opportunity to strengthen relationships with one another, the community, and Institutions, and in doing so, encourage healing of the land. Focusing on the individual's experience in this course helped to model holism from the individual to the group, engage the teachings of the Medicine Wheel framework, and reinforce the importance of a relationship with place to achieve the learning outcomes of the course. Beyond the course itself, this decentralized, land-based learning opportunity also contributed to a greater sense of community with students, scholars, and community members, which will help strengthen future stewardship and restoration efforts at Bkejwanong and across the traditional territories for the benefit of future generations.

CONCLUSION

Developing and sharing lessons learned from a codeveloped field course on Indigenous lands and with

communities represents an effort to decolonize learning within academia. Our ongoing journey with this effort to shift science culture will take time. However, we hope that along that journey, a broad range of science and research excellence outcomes will include the ability of land-based learning to:

- center Indigenous ways of knowing nature in educational institutions by decentralizing the learning onto the land,
- recognize the contributions of Indigenous scholars to Western science education,
- fully engage Indigenous ways of knowing nature (in this case, Anishinaabe teachings and culture) as a complementary and essential thread in biological and environmental education, and
- play a role in bringing together Indigenous and non-Indigenous Canadians and redressing the harm done by colonialism by moving forward with new forms of institutionally based education.

Collectively, this effort is one of many that are required to support the creation of new, rich forms of research and educational experiences that are connected to the lands and recognize the rights of Indigenous peoples of that place.

CASE STUDY QUESTIONS

1. What opportunities for relationship building and transformative, decolonial teaching practices exist in your local context and institution?
2. Decentralizing knowledge away from the institution and onto the land, among multiple knowledge keepers both Indigenous and non-Indigenous, was a key component of the course. To what extent can this approach be applied to your local context and institution?
3. “We are all treaty people.” This refers to the roles of both settler and Indigenous communities in working toward reconciliation. To what extent can efforts support reconciliation with Indigenous peoples in a good way?
4. The decolonial approach in this course was designed to create safe space for Indigenous voices and to encourage the learner to transform the ways

in which they perceived nature, science, and Indigenous communities. In what other contexts would decolonial approaches be useful in teaching?

5. Thinking about the reader’s local context, how does the described approach benefit or enrich both Indigenous and non-Indigenous learners in existing Western science degree programs and institutions?

APPENDIX A

WALPOLE ISLAND FIELD COURSE PRECOURSE SURVEY

This course immerses students in history, ecology, restoration, invasive species, and planning in Indigenous contexts. Students will explore Indigenous and non-Indigenous ecological restoration efforts while simultaneously assisting in community-based projects aimed at environmental and cultural restoration. Before you go through the course process, we would like to survey some questions that are important for the learning outcomes. Thank you very much for taking it.

This survey was designed by HaiTao Yu, PhD Candidate in General Management (Sustainability) at Ivey Business School, Western University.

1. Your name:
2. Your year in university:
3. Your major:
4. Tell us why you take this course?
5. What do you expect to learn?
6. How much do you know about the colonial history of Canada?
7. How much do you know about Indigenous culture?
8. How much do you think you are connected to nature and the land?
9. How much do you know about the ecology in southwestern Ontario?
10. What does reconciliation mean to you?

AUTHOR CONTRIBUTIONS

C. Jacobs: conceptualization, funding acquisition, project administration, methodology, supervision, resources, writing—review and editing.

C. Donaldson: conceptualization, funding acquisition, project administration, writing—original draft.

J. Ives: writing—review and editing.

K. Keeshig: writing—review and editing.

T. Day: conceptualization, project administration.

C. Febria: conceptualization, funding acquisition, project administration, resources, supervision, writing—review and editing.

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COMPETING INTERESTS

The authors have declared that no competing interests exist.

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