Project-based learning activities as a pedagogy that encourages future 'change makers'

MEd Portfolio

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Abstract

This portfolio argues that project-based learning is an effective environmental education pedagogy to empower future change makers. The deliverables of this portfolio are two cross-curricular resource bundles, *Stephany Hildebrand: Framing the Environment* and *Abraham Francis: A Voice for the River*. These resource bundles are a part of the larger Great River Rapport Change Maker Series, which was created to empower future change makers. These resource bundles entail a case study about a change maker paired with a project-based learning activity to model the actions of a change maker. The development of these resource bundles was influenced by courses in the MEd program, including but not limited to Decolonial Approaches to Environmental Education, Changemaking in Climate Change Education, Wild Pedagogies, and Activism in Education. Influences beyond the MEd program also include my experiences as an undergraduate student and my work at a non-profit environmental organization, the River Institute. These resource bundles employ Land-based environmental education approaches, activist pedagogies and decolonial pedagogies. This portfolio demonstrates that a combination of these pedagogies with project-based learning is a promising approach that can empower future change makers.

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Chapter 1: Introduction

Background

I witness daily proof of alarming environmental degradation in my role at an environmental science non-profit while also witnessing the keen interest of college learners and education program learners in protecting the environment. Through these experiences, paired with volunteering for a civics action program as an undergraduate student and a variety of contracts that I worked on as an environmental educator, I have become keen to find ways to protect the environment, especially by means of education. With imminent threats of climate change to the environment and society, today's learners are in a unique position where they will be disproportionately impacted by the climate crisis compared to older generations and have limited opportunities for influencing action (Galway & Field, 2023). It is, therefore, crucial that educators help learners to be heard by decision-makers, for learners to feel heard, and to have safe spaces to be heard (Galway & Field, 2023). It is concerning that the required skills and self-efficacy to engage in meaningful change-making actions are not commonly taught in the education system, which based on my own experiences, still largely follows the 'banking model' discussed by Freire (2000). Freire (2000) discusses the 'banking model' as entailing facts being deposited by the teacher, where instead of engaging in critical thinking and skills development, learners are expected to simply digest facts and regurgitate them. In opposition to such a model, Freire (2000) calls for a shift to instead engage learners in critical thinking to produce more informed citizens, aligning with Galway & Field's (2023)'s call to action for helping learners to be heard and feel heard by decision-makers. The resource bundles featured in this portfolio aim to engage learners in a lived curriculum that entails project-based learning activities that can help learners be heard and feel heard by their communities about environmental and social issues that they care

about (Aoki, 1993; Galway & Field, 2023).

Purpose of the Portfolio

This portfolio has two purposes. The first is to create freely accessible and effective project-based resource bundles to support educators in implementing project-based learning in their classrooms, which intentionally focuses on empowering future change makers. This portfolio also demonstrates how project-based learning approaches can help environmental science non-profits mobilize and extend their curricular resources into classrooms.

As shown by Galway & Field (2023) regarding youth climate anxiety, youth have the desire to partake in what Aoki (1993) terms a lived curriculum. The lived curriculum that Galway & Field (2023) highlight entails learning about environmental solutions for climate change and being heard by decision-makers, in other words, relating learning to lived experiences of climate change anxiety (Aoki, 1993). From what I have witnessed through working in education, too often, **l**earners are subject to what Aoki (1993) refers to as curriculum as plan, which entails following a classic curriculum document and often being out of touch with lived experiences.

The project-based learning activities featured in these resource bundles are designed to provide learners with the opportunity to bring projects beyond the four walls of the classroom. Through implementing projects beyond the classroom, these resource bundles incorporate a lived curriculum and provide an opportunity for learners to be heard by their community regarding different environmental or social issues, such as climate change (Aoki, 1993). These resource bundles can be a model for developing future environmental education resources to help implement climate action project-based learning in as many classrooms as possible.

The second purpose of this portfolio is to explore and emphasize literature

related to project-based learning, like that implemented in the Great River Rapport Change Maker Series, as an effective pedagogy to empower learners to be future change makers. This portfolio provides evidence to support the widespread adoption of project-based learning in the modern education system that is intended to empower learners to take action in their communities.

The Great River Rapport Change Maker Series

The Great River Rapport Change Maker Series is a series of free, cross-curricular resource bundles designed for grades 7-12 that I designed and created as a part of the Great River Rapport Ecosystem Health Report. There are two main components of each resource bundle; the first component is a case study story about an individual 'change maker' which is designed to resemble a magazine with interesting layouts and photographs, as well as sub-headings throughout the stories, and bolded keywords with definitions to support vocabulary expansion. Case studies are intended to engage learners with stories that are relatable and inspire similar action. The second component of these resource bundles is a lesson plan detailing a learning activity in which the intention is for students to step into the shoes of the change maker through a project-based learning activity. The lesson plan includes a clear, step-by-step guide for educators, as well as multi-media components, such as videos and podcasts, to support student engagement and all required student handouts. The overall goal of this series of resource bundles is to support educators in empowering and modelling change maker skills and processes.

The Great River Rapport

The Great River Rapport is an ecosystem health report focused on the Upper St Lawrence River, conducted by the River Institute in Cornwall, Ontario (Great River Rapport, 2017). The River Institute (2024) is a non-profit organization focusing on

research, outreach and education on the St Lawrence River. The River Institute's award-winning education team was developed to inspire youth to engage in environmental stewardship and encourage youth to pursue careers in environmental science. The River Institute engages thousands of learners annually through various education programs, including experiential learning workshops about local freshwater ecology, water festivals, case study competitions, and more. The River Institute came to fruition in 1994 due to concerns regarding industrial pollution that led to heavy metal contamination in the sediments of the river. (River Institute, 2024). The Great River Rapport ecosystem health report was born in 2018 because the community would continue to ask the River Institute: *what is the health of the river?*

In the early stages of developing the Great River Rapport, Dr. Henry Lickers insisted that the project be framed by the Haudenosaunee Thanksgiving Address. The Great River Rapport (2023) describes the Thanksgiving Address as:

> The Thanksgiving Address, known as the Ohén:ton Karihwatéhkwen or "words that come before all else". It is a Haudenosaunee practice for clarity that can be heard during formal settings, such as ceremonies and significant events, but it is also said every morning when the sun rises to acknowledge all that was created, to send gratitude, and to continue to live with a good mind. When we continue to send gratitude to all that was created, the natural elements continue in their natural equilibrium. Thus, we are fulfilling our original instructions to care for all of creation and in return, these elements will continue to fulfill theirs.

With the framing of the Thanksgiving Address, this ecosystem health report aimed to take a holistic approach to reporting on ecosystem health that encompassed Indigenous perspectives, community knowledge and Western science (Great River Rapport, 2017). In an effort to further engage the community with the project, several other components were added to the project. This includes community stories that highlight individuals

who are engaged with the river and nearby ecosystems; videos of workshops that engage the community with scientific sampling methods, art, Mohawk traditions, and how to help conserve the environment; calls to action, which include encouraging the use of community science apps and websites; Indigenous art as a representation of the Thanksgiving Address throughout the project; and education.

Thanksgiving Address

A special part of the Great River Rapport project is that the Thanksgiving Address is related to all components. The community stories, for example, remind us that we are all connected to the river, and the workshops highlight the many different levels of creation, from the water to insects and fish (Great River Rapport, 2023). As is seen on the Great River Rapport's (2023) website, each level of creation is depicted by beautiful line work by Akwesasne artist Victoria Ransom. The line work is coupled with a description written by Victoria to describe each level in her own way. These visuals and corresponding descriptions are featured throughout different components of the project. Another important piece of the Thanksgiving Address is that the aim is to bring the minds of its listeners together as one (Great River Rapport, 2023). For each featured change maker, one of the levels of the Thanksgiving Address, inclusive of the line art and description, is related to their story and work, and is positioned as the opening to the case study story. Especially when read to learners as a group, it is intended to bring everyone's mind together as one before proceeding into the project-based learning activity. This essential teaching of the Thanksgiving Address can foreshadow the collaborative nature of the project-based learning activities that are to follow.

Featuring the Thanksgiving Address in the Change Maker Series is also a small way that concepts of Land-based education are implemented within resource bundles (UNESCO, 2021). This is because the Thanksgiving Address is based on Indigenous

(Haudenosaunee) worldviews, it helps learners understand their place within and responsibility to the rest of creation, and it teaches learners to view Land as a relative rather than a resource (UNESCO, 2021). As highlighted by McCoy, Elliot-Groves, Sabzalian, & Bang (2020), the current education system mostly teaches learners that Land is a resource that exists for human use and monetary gain. In contrast, the Great River Rapport, through the framing of the Thanksgiving Address, aims to teach learners to have respect and gratitude for Land. This is an important piece for encouraging future change makers, as changes in policies for better environmental protections can come from changing people's relationships with Land (UNESCO, 2021).

Although the Great River Rapport was successful in engaging the local community through these many components, youth engagement was missing. When I joined the Great River Rapport team with qualifications as a secondary science teacher, the team was keen to have me begin developing education materials to engage youth with the project, its scientific findings, and the river generally. The initial priority set by the team was for me to develop education materials that engage learners with scientific data used in the ecosystem health report. Due to a lack of scientific indicators being complete at the time, however, I was granted the opportunity to be creative, which gave rise to the Change Maker Series.

Personal background

My role at the River Institute has changed a few times since 2018. I began as a summer student with the role of Jr. Environmental Educator/ Biologist. Then, I led nature-based summer camps, assisted with fieldwork, and gained an overall appreciation and passion for ecology and environmental education. The knowledge, skills, and passion gained from this work were instrumental in empowering me to find ways to engage learners with the environment through education. After graduating with a Bachelor of Education, I returned to the River Institute for a quick summer contract that soon turned

into a one-year contract as a Research Assistant/ Educator while also being sub-contracted to St Lawrence College to teach General Biology for the Environmental Technician Program. This role proceeded to shift to a project coordinator position that includes public outreach, communications, education material development and more while continuing to teach at St Lawrence College.

Inspiration for the Change Maker Series

The Change Maker Series was designed because I wanted to contribute to meaningful change for the environment. Through taking part in fieldwork at the River Institute, I learned about the environment at an intimate level, gaining a deeper appreciation for it and its overall need for protection. In the summer of 2021, I attended a Great River Rapport (2023) workshop entitled *Ever wonder how to protect Monarch Butterflies,* facilitated by Christina Enright. In this workshop, Christina highlighted how she had a second chance at life after a devastating cancer diagnosis and how she found new meaning by advocating and caring for monarch butterflies. I related deeply to her newly acquired appreciation for this aspect of nature and her desire to protect it. While listening to Christina's story and thinking about the actions she took to contribute to making meaningful change for this species, such as collecting caterpillars, advocating for less roadside cutting of milkweed, and community outreach, I asked myself how I could be a change maker like she was at a personal and professional level. The first tool I could think of that was readily available in my toolbox was education, as I had just finished a Bachelor of Education. Shortly after this, I identified a list of other individuals I deemed change makers and began developing the Great River Rapport's Change Maker Series. Identifying individual change makers was a very personal experience. To me, a change maker is passionate, resilient, patient, hopeful, and has concrete examples of how they are taking action. Another important consideration was for there to be enough actions to tell a proper story for the case study. I needed a good amount of clear evidence to work

with.

As noted on the Great River Rapport website, Christina Enright was one of the first featured change makers and the inspiration for beginning the resource bundles with a story followed by encouraging learners to step into their shoes through a project-based learning activity. Not only was I inspired by Christina's story, but I was also committed to taking action as a change maker through the development of engaging education materials.

Featured Great River Rapport Change Makers

Stephany Hildebrand: Framing the Environment

To engage learners with environmental action through art, one of the two resource bundles featured in this portfolio is about Stephany Hildebrand. Stephany was chosen as a change maker because of her unique ability to use her skills in photography and design, scientific knowledge, and passion for the environment to advocate for change in social and environmental contexts. In choosing change makers to highlight in this series of education resource bundles, it was easiest to feature individuals I already knew due to the details needed to write a story and the intended collaborative nature of developing these resources. Stephany happens to be a friend and colleague of mine at the River Institute. I considered asking her to be a change maker for quite some time, and I observed her actions over time to confirm that she would be a good fit. I have always admired how she speaks up for what she believes in, regardless of who might be watching, which, to me, makes her a real change maker. In developing her story, we had many insightful conversations about her childhood that brought us closer as friends. My favourite memory from developing this resource bundle was when we sat together on the edge of the River Institute dock brainstorming the structure and flow of her learning activity. Stephany and I always come up with the best ideas when surrounded by nature.

Stephany's case study *Stephany Hildebrand: Framing the Environment* details her story and pathway in becoming a Visual Communications specialist at the River Institute, where she combined her unique set of skills, knowledge and passion to be an effective communicator that elicits care for usually overlooked species in settler society, such as the American Eel. Another important consideration for Stephany as a change maker was that she is an advocate beyond her professional work, often bringing awareness to various environmental and social issues using photography. Throughout Stephany's case study, learners are provided with photography tips and inspiration for how they can also use visual communication skills to contribute to change.

The project-based learning activity that complements Stephany's case study emphasizes how this series of resource bundles aims to be cross-curricular, as learners are tasked with creating a visual portrait of a place to create awareness for it. To equip learners with the specific photography techniques and knowledge necessary to engage in this learning activity, Stephany created a short lecture-style video that is linked in the lesson plan for teachers to access, which provides all the necessary information for creating a portrait of a place.

This project-based learning activity models the philosophies of Land as first teacher discussed by Styres (2011), as learners are tasked with finding and spending time in a place of interest to photograph for their portrait of a place. This task entails independent time to connect with their chosen place, whether urban or rural, allowing nature to be first teacher (Styres, 2011). Through this learning activity, the Land informs learners storying and reflective practice, emphasizing the interconnectedness of ourselves and everything around us with the Land (Styres, 2011).

Abraham Francis: A Voice for the River

To engage learners with Indigenous ways of knowing, encourage an increased

understanding of settler colonialism in what is now known as Canada, and ensure that Indigenous learners can relate to being a change maker, the second resource bundle featured in this portfolio is about Abraham Francis. Abraham is Wakeneniothró:non (Deer Clan) from the Kanienkehaka (Mohawk) community of Akwesasne. I chose Abraham to be a change maker because of the vast amount of work he does to advocate for his community and culture, his courage for speaking up in settler-dominated spaces, and his work advocating for the Rights of Rivers. As with Stephany, I had a pre-existing relationship with Abraham prior to the development of this resource bundle. I knew for a long time that I wanted to ask Abraham to be featured as a change maker for this series, as he was taking part in inspiring action almost every day. Abraham and I have known each other since about 2021, when I joined the Great River Rapport team full-time. Abraham worked for the Mohawk Council of Akwesasne at the time and was a founding partner of the project. Since this time, Abraham became a consultant on the River Strategy initiative (my main project at the River Institute), which has brought us together in many one-on-one meetings, catch-ups, working sessions, reflections, co-presentations to various groups, and lots of laughs. Abraham and I have gone from colleagues to friends. I am very grateful for all that he has shared with me and taught me, especially in the development of this resource bundle.

Abraham's case study *Abraham Francis: A Voice for the River* explains his pathway to being an advocate for his culture and community, as well as his current endeavours advocating for the Rights of Rivers. Abraham's love for his community, passion for the river, and knowledge of the damages wreaked upon his community's Land and water by ongoing settler colonialism has led him to advocate for his community to engage with the river like they once did and to hold systems and people accountable to these harms. It is important to note in this portfolio that settler colonialism is the repression of the rights and cultures of Indigenous Peoples through the means of

erasure and replacement, with settlers profiting from the theft and exploitation of Lands and resources that belong to Indigenous Peoples (Cornell Law, 2022). The harms imposed by settler colonialism was emphasized throughout Abraham's case study story. Throughout the case study, bolded keywords define terms that are important for Canadians' responsibilities in reconciliation and to help learners understand ongoing environmental damages faced by Indigenous communities while providing more context to Abraham's story (TRC, 2015).

The project-based learning activity that complements Abraham's case study entails writing a letter to the river (or other ecosystem). The idea is for this learning activity is to model Abraham's work advocating for the Rights of Rivers and to engage learners with the concept of Land/water rights. This key concept is explained in a video presentation by Abraham and his colleague, Lee Willbanks, a settler ally that works closely with Abraham and others advocating for the Rights of Rivers and is hyperlinked at the start of the lesson plan to emphasize to teachers that they need to show this teaching before proceeding with the learning activity. This resource bundle aims to engage learners in a positionality exercise, research, and connect with Land or place. It is also a way for learners to advocate for a chosen ecosystem, much like Abraham does for the St Lawrence River.

This resource bundle was influenced by decolonial (Korteweg & Russel, 2012). It is my own responsibility, as a white settler educator, to model steps for educators and learners in the direction of decolonizing education. The case study highlighting Abraham Francis aims to recognize, center and honour Indigenous worldviews, Land rights, knowledge and language systems that have kept ecosystems healthy, vibrant and intact since time immemorial (Korteweg & Russell, 2012). Abraham's story highlights for learners that every environmental catastrophe in Canada, such as the industrial pollution highlighted in his story, is in turn, a catastrophe on Indigenous Land harming

Indigenous peoples most deeply (Korteweg & Russell, 2012). The goal is for learners to shift their views of environmental issues as those that primarily impact and harm Indigenous peoples and communities, such as mercury contamination in the St Lawrence River, because they have the closest ongoing relationships with the Land and water (St Lawrence Remedial Action Plan, 2024; Korteweg & Russell, 2012). The project-based learning activity of writing a letter to the river (or other ecosystem) was influenced by place-based education (Styres. 2011).

As with Stephany's learning activity, an aspect of Abraham's learning activity is for learners to spend time in a place, but in this case, to connect with a place intimately enough to write a letter *to* it. This aspect relates to the Indigenous philosophy of Land as first teacher (Styres, 2011). This letter *to* an ecosystem relates to the pedagogy of Land as first teacher as learners are encouraged to observe and connect with the Land around them and engage in reflection about their reciprocal and respectful relations with that Land (Styres, 2011). This exercise helps learners to understand the interconnectedness of everything and everyone with the Land, as well (Styres, 2011).

While designing this learning activity, I reflected on my experiences taking part in learning activities facilitated in my Wild Pedagogies MEd course. This course entailed heading outside to observe and reflect almost on a weekly basis. I was very fond of these activities as I was given an opportunity to prioritize being outside and observe my surroundings with intention. I discovered that these intentional activities gave rise to new observations and realizations, including reflections on my personal connections to these places and the Land. The learning activity of writing a letter to the river (or other ecosystems) is intended to create opportunities for learners to have similar experiences as I did.

Chapter 2: Literature Review

Research Question

This literature review connects with research on project-based learning activities as a pedagogy to encourage learners to be future change makers. This investigation into the literature is useful as it builds the case for developing project-based learning activities, like that of the Great River Rapport Change Maker Series. It may also have the potential to provide evidence to influence school board priorities or pedagogical decisions of other teachers.

Introduction

Defining project-based learning activities

Most educators have heard the buzz term, *project-based learning*; but are unclear as to what this curricular approach means in practice. Project-based learning is defined in a variety of ways across the literature, often using terms such as *student-centred*, *active learning*, *self-teaching*, *research*, and *collaboration* (Juanengsih, Mahmudah & Ruri, 2018; Mingmei, 2019; Revelle et al., 2020). Juanengsih, Mahmudah & Ruri (2018) describe project-based learning as a collaborative, student-centred approach that encourages active, in-depth learning by investigating real issues within the community. With some similarity to Juanengsih, Mahmudah & Ruri (2018), Revelle et al. (2020) describe project-based learning as a collaborative process that occurs over an extended period of time, providing choice to learners and that has a purpose which is authentic and that connects to contexts beyond the classroom. With these two descriptions, it can be deduced that a key aspect of project-based learning is the investigation of real issues in the community that are of interest to learners (Juanengsih, Mahmudah & Ruri, 2018; Revelle et al., 2020). For the purpose of this literature review, concepts of project-based learning will be discussed in the context of project-based learning activities, as this

terminology is used to describe project-based lessons within the Great River Rapport Change Maker Series.

As accentuated by Reid-Griffin, Sterrett & Stanback (2020), project-based learning is an instructional approach that should be a part of a radical paradigm shift. To support this call to action by Reid-Griffin, Sterrett & Stanback (2020), this review will highlight positive outcomes associated with project-based learning activities, strategies for effective implementation in the classroom, acknowledge challenges associated with the implementation of project-based learning activities in classrooms, as well as opportunities presented by the implementation of this pedagogy.

Influential Environmental Education Pedagogy

In addition to project-based learning pedagogies, it is important to note that the resource bundles presented in this portfolio were influenced by various other pedagogies relevant to environmental education. The most relevant pedagogies, beyond project-based learning, to the development of the two resource bundles *Stephany Hildebrand: Framing the Environment* and *Abraham Francis: A Voice for the River* include Land-based environmental education, wild pedagogies, decolonial pedagogies and activist pedagogies. I found the touchstones presented by Jickling et al. (2018) for wild pedagogies compelling. I was particularly drawn to the idea of providing learners with agency and creating a role for nature as a co-teacher, and locating the wild (Jickling et al., 2018). Although Jickling et al. (2018) discuss wild pedagogies in the context of early childhood education only, Nguyen & Walters (2024) provide evidence for how these touchstones are likely equally as relevant for adolescents, in which the Change Maker Series is most relevant to. Nguyen & Walters (2024) highlight how exposure to nature has similar positive effects on cognition in both young children and adolescents, for example.

As Jickling et al. (2018) emphasize, nature gives rise to a wider range of

knowledge and understandings and that allowing nature to be a co-teacher resists normalizing the hierarchical separation of humans from non-human beings. I made a conscious effort in the design of learning activities in these resource bundles to ensure that spending time in and with nature, observing it, exploring it, and feeling it was encouraged. Locating the wild is the other touchstone presented by Jickling et al. (2018) that I tried to emphasize in the two learning activities. While encouraging teachers to bring learners outside, I also added emphasis on urban landscapes being an ample space for learning. I agree with Jickling et al.'s (2018) insistence that wildness can be encountered in a wide range of settings, including urban landscapes.

A second pedagogy relevant to environmental education that influenced the development of these resource bundles is decolonial pedagogies that begin with Indigenous stories or narratives of the Land. Cormier (2018) explains that decolonizing our minds entails Indigenous Peoples reclaiming and telling their personal narratives. Narratives about the Land are explained by Cormier (2018) as being of particular importance due to its role of transferring Indigenous culture and history. This Land-based pedagogy, which is a decolonial pedagogy, is centered on helping learners discover their responsibility to, and place within the world (UNESCO, 2021). A key principle of Land-based education is changing individuals' relationships with the land, which is thought to also contribute to a higher likelihood of protecting it (UNESCO, 2021).

With the overarching goal of the Change Maker Series to empower youth as change makers in protecting the environment, it was critical to adopt this pedagogy. Land-based pedagogies influenced how I designed learning activities to encourage teachers to bring learners into nature. The design of the resource bundle *Abraham Francis: A Voice for the River,* in particular, emulates how it is important to go beyond just bringing learners into nature, but to also provide learners with context about the

Land, highlight the Indigenous cultures of whom that Land belongs and Indigenous ways of knowing (UNESCO, 2021).

Through this particular resource bundle, and with the consultation of Abraham in the framing of his case study, it is intended to shift the way in which learners think about Land (and water) so that they begin to think about how colonialism has influenced the Land, their relationship with it, and how harming the Land is akin to harming the Indigenous communities of that Land (Korteweg & Russell, 2012).

A third pedagogical influence on the development of these resource bundles that is relevant to modern environmental education is activist pedagogy. A description of activist education by Niblett (2017) delineates that it entails guided activities that support learners in understanding their ability to contribute to real change. As with decolonial pedagogies, this key principle directly aligns with the goal of the Change Maker Series, which is to empower future change makers. It is further explained by Niblett (2017) that this pedagogy entails learning activities that are hands-on, mind-on and to some extent, student-directed. In the design of the learning activities for these two resource bundles, I tried to find ways to incorporate these aspects as much as possible. For example, in the *Stephany Hildebrand: Framing the Environment* resource bundle, learners are engaged in a minds-on activity while identifying aspects of their chosen place to photograph in an attempt to best achieve the intended goal of bringing awareness to it. Niblett (2017) explains how activist education also has three main components, which include ideas and actions or otherwise, putting ideas into action. It is emphasized that activist education warrants learners taking action and that this action should always be paired with some amount of reflection (Niblett, 2017). This reflective piece of activist education is one of the main messages provided by the case study *Abraham Francis: A Voice for the River*, as he urges future change makers to take action with love and kindness in mind.

Positive outcomes associated with project-based learning activities

Throughout the literature, it is discussed that there are many positive outcomes associated with the implementation of project-based learning activities. Positive outcomes include the acquisition of new skills, increased engagement and initiative, increased self-efficacy, as well as an increased likelihood of engaging in community action.

Skills acquisition

An important skill associated with project-based learning activities includes collaboration (Juanengsih, Mahmudah & Ruri, 2018; Reid-Griffin, Sterrett & Stanback, 2020). Juanengsih, Mahmudah & Ruri (2018) emphasize the role that project-based learning activities play in preparing learners for the workplace through collaborating with peers. This is also supported by Reid-Griffin, Sterrett & Stanback (2020), who discuss project-based learning activities as a pedagogy that allows learners to engage in collaborative learning. In addition to collaboration, Juanengsih, Mahmudah & Ruri (2018) and Reid-Griffin, Sterrett & Stanback (2020) both justify project-based learning activities as effective in supporting the acquisition of problem-solving skills as learners collaborate with peers. Lastly, independent learning is highlighted as a skill acquired through project-based learning, as learners take responsibility for their projects from start to finish, from the design to the planning and implementing projects in the community (Juanengsih, Mahmudah & Ruri, 2018). In addition to being important skills for the workplace, as highlighted by Juanengsih, Mahmudah & Ruri (2018), I credit these skills as being vital for learners to be effective change-makers in their communities.

Engagement and initiative

A study by De Beer (2019) focused on outcomes related to project-based learning. It showed that most participating teachers encountered improved energy in their classrooms and that learners demonstrated interest and even feelings of inspiration by participating in science project-based learning activities (De Beer, 2019). Similar reports also come from the work of Mingmei (2019), who describes benefits such as increased motivation, initiative for one's own learning, and positive attitudes associated with learners taking responsibility for a portion of a project. In a study about teacher's views of project-based learning in practice by Aksela et al. (2019), it is highlighted that although not intended, project-based learning often leads to better class attendance, and as with Mingmei's (2019) study, improved attitudes toward learning. These studies by De Beer (2019), Mingmei (2019) and Aksela et al. (2019) clearly demonstrate that the implementation of project-based learning activities can create the potential for positive shifts in a classroom atmosphere, and it can be an effective strategy to engage learners.

Increased self-efficacy

Although it often seems to be overlooked as an important achievement, self-efficacy is another valuable outcome associated with project-based learning (Ballard, Cohen, Littenberg-Tobias, 2016; Stewart, Burke & Askari, 2022; Reid-Griffin, Sterrett & Stanback, 2020). Especially in projects directly involving real-world contexts, like the action civics program discussed by Ballard, Cohen, Littenberg-Tobias (2016), learners demonstrated increased civic self-efficacy. Through participating in projects that bring awareness to a water crisis in their community, learners in a study by Stewart, Burke & Askari (2022) also gained self-efficacy related to their ability to be agents of change within their community. Another influence of learner self-efficacy discussed in the literature related to project-based learning is centered on learning environments (Reid-Griffin, Sterrett & Stanback, 2020). In their study about the influence of project-based learning on middle school learners, Reid-Griffin, Sterrett & Stanback

(2020) stress the importance of a positive learning environment to foster self-efficacy, with positive learning environments associated with collaborative projects. Juanengsih, Mahmudah & Ruri (2018) also highlight that project-based learning involves various types of tasks which cater to various learning styles. I attribute catering to various learning styles as being another contributing factor to increased self-efficacy brought about by this instructional approach, as learners get to witness the outcomes of their work and come to know that they are capable.

Increased likelihood of community action

A positive outcome of project-based learning that directly relates to the theme of this portfolio is that learners are reported as being more likely to engage in community action after participating in project-based activities (Blevins, LeCompte & Wells, 2016; Stewart, Burke & Askari, 2022; Hart & Wandeler, 2018; Reichert & Print, 2018). Engaging in community action is described differently across the literature, with Blevins, LeCompte & Wells (2016), Hart & Wandeler (2018) and Reichert & Print (2018) emphasizing the likelihood of learners engaging in civic action as an outcome of engaging in civics action projects. A noteworthy characteristic of studies by Blevins, LeCompte & Wells (2016), Stewart, Burke & Askari (2022) and Reichert & Print (2018) is that they discuss action projects that focus directly on interacting with local communities. I argue that this makes outcomes related to an increased likelihood of engaging in community action applicable to any community-based projects unrelated to civics, as well. It is important to note that an emphasis on civic action projects in the literature might be due to the preliminary use of key terms for this literature search related to civic action projects. Melaville, Berg & Blank (2006) discuss community-based (i.e. project-based) learning more generally, expanding their scope beyond civic action projects to include any project that entails learners choosing a topic of interest within their community. Melaville, Berg & Blank (2006) report that this instructional approach contributes to learners connecting to their communities and increasing civic responsibility.

Effective implementation of project-based learning activities

For project-based learning activities to reap the benefits discussed above, teachers need to ensure this instructional approach is implemented strategically to be effective (Andolina & Conklin, 2020; Aksela et al., 2019). In the context of civics education specifically, Andolina & Conklin (2020) voice concern about the quality of civics programming across the United States, stating that it is most often focused on political knowledge rather than project-based learning approaches that involve participating in their communities and the acquisition of skills. Aksela et al. (2019) emphasize that the ability of teachers to implement project-based learning approaches in their classrooms determines how effective this instructional approach can be in the context of learner outcomes.

Providing choice

A seemingly non-negotiable strategy for the effective implementation of project-based learning activities is providing learners with choice and autonomy (Andolina & Conklin, 2020; Melaville, Berg & Blank, 2006; Aksela et al., 2019; McWilliams, 2019; Watters & Diexmann, 2013). Aksela et al. (2019) describe the element of choice as a vital indicator of learner success, as it deepens learning. As highlighted by Melaville, Berg & Blank (2006), feelings associated with control and choice over projects are linked to learning, and a key characteristic for the effective implementation of project-based learning activities is for teachers to be explicit in their role as guides rather than informers, helping learners to explore their interests rather than being told what to explore (Melaville, Berg & Blank, 2006). Stewart, Burke & Askari (2022) provide further evidence for the role of educators as guides, as they discuss success associated with teachers encouraging learners to be genuinely interested in their project topics. A study by Andolina & Conklin (2020) also found that increased care and interest in project topics was a significant predictor of positive project outcomes. McWilliams (2019) and Acar (2010) also emphasize the importance of learner autonomy in the process of project design and

implementation. As with providing student choice when identifying project topics, teachers play a key role in guiding learners to be autonomous in project design and deciding on next steps (Acar, 2010).

Real-world contexts

Another key strategy for the successful implementation of project-based learning activities is to engage learners in real-world contexts (McWilliams, 2019; Cohen et al., 2021; Stewart, Burke & Askari, 2022; Hart & Wandeler, 2018). For this literature review, real-world contexts include anything from designing a project to address an issue in the local community, the use of real data or information to come to conclusions and engaging with community partners through projects. Having learners engage with real community contexts was found by McWilliams (2019) to allow learners to develop a sense of purpose, ownership, and leadership in their projects. Cohen et al. (2021) add how connecting the classroom to real contexts allows learning to feel more relevant and interesting while also increasing general academic engagement. Results in a study about civic action projects by Stewart, Burke & Askari (2022) also indicated positive results associated with real-world contexts in projects, as learners seemingly gained self-efficacy related to their abilities to contribute to addressing issues in their communities. It was also found by Hart & Wandeler (2018) that learners reported a higher civic commitment based on how authentically projects involved the community. Overall, it seems that there is higher learner satisfaction associated with authentic community involvement in project-based learning activities (McWilliams, 2019; Cohen et al., 2021; Stewart, Burke & Askari, 2022; Hart & Wandeler, 2018). As emphasized by McWilliams (2019), it is important that learners discover what lies beyond the four walls of a classroom. With the evidence provided by this literature review, I believe that community involvement (i.e. real-world contexts) in project-based learning activities is a promising way to help learners discover what lies beyond the classroom.

Environmental factors

A recurring theme throughout the literature related to best practices for successfully implementing project-based learning activities is the emphasis on the existing environmental factors in a classroom, as it is suggested that a supportive, attentive classroom environment is critical for success (Melaville, Berg & Blank, 2006; Andolina & Conklin, 2020). In a study focused on activism projects and the likelihood of learners engaging in activism outside of the classroom, it was uncovered that the classroom environment is a significant predictor (Bencze, Sperling & Carter, 2012). It is explained by Bencze, Sperling & Carter (2012) that anyone in the immediate learning environment can influence engagement, inclusive of the teacher, classmates and administration staff. Based on the literature, there are two main contributing factors to creating a supportive and attentive classroom environment, that is, teacher support and a culture of collaboration (Melaville, Berg & Blank, 2006; Revelle, Wise, Duke et al., 2020).

Although the successful implementation of project-based learning activities requires that teachers take a step back and act only as a guide, support and feedback from teachers throughout the entire process of project-based learning activities is vital for learner success (Melaville, Berg & Blank, 2006; Stewart, Burke & Askari, 2022). Stewart, Burke & Askari (2022) highlight how in post-project interviews, learners voiced a need for more feedback and support from their teachers in developing their projects. Stewart, Burke & Askari (2022) note evidence of learners interpreting feedback from teachers as constructive and intended to improve their work when in the context of project-based learning activities, rather than interpreting teacher feedback as judgmental as is often perceived by learners in traditional learning environments. Melaville, Berg & Blank (2006) add that learners often want continuous feedback from teachers that is sincere and supportive, including concrete suggestions to improve their projects. Regarding general encouragement from teachers, Andolina & Conklin (2020) highlight results that indicate that if learners perceived encouragement and respect for their opinions from teachers, then they

were more likely to engage in work related to their chosen issue again in the future. Evidently, teachers need to maintain a delicate balance between allowing learners to be autonomous in the design of projects and providing constructive feedback to support learners in project development (Acar, 2010; Stewart, Burke & Askari, 2022).

Beyond the support of teachers in the development of project-based learning activities, learners also require a supportive environment from peers to achieve the best learning outcomes (Revelle, Wise, Duke et al., 2020). It is recommended by Revelle, Wise, Duke et al. (2020) that teachers make a conscious effort to create a culture of collaboration in their classrooms through strategic pairing of groups and explicit discussion about best practices to collaborate effectively with peers. A strategy utilized by a teacher in the study by Andolina & Conklin (2020) to create a culture of collaboration in their classroom, for example, is to encourage enthusiastic clapping and praise when peers present projects.

Challenges associated with project-based learning activities

As mentioned above, although strategies have been identified to effectively implement project-based learning approaches in the classroom, this instructional approach also comes with its challenges (Aksela et al., 2019). It is important to note, however, that many of the challenges associated with the implementation of project-based learning approaches are influenced by individual teachers' beliefs and attitudes and can likely begin to be overcome with training (Revelle, Wise, Duke et al., 2020; Aksela et al., 2019). A common challenge that is discussed by Aksela et al. (2019) is that teachers are resistant to instructional approaches that provide high amounts of autonomy to learners, such as project-based learning, as this is perceived as giving up control of their class. This challenge lends itself to the call to action by Dobson & Dobson (2021) for schools to create better spaces for learners to embrace their own agency and foster collaboration. Relating to Dobson & Dobson's (2021) call to action is a challenge emphasized by Revelle et al. (2020), which is a need for a pre-existing culture of collaboration in a classroom

for the effective implementation of project-based learning activities.

Other challenges associated with the implementation of project-based learning activities reported by teachers include perceived challenges in supporting diverse learning needs (Revelle, Wise, Duke et al., 2020). Hart & Wandeler (2018) specifically highlight unique challenges associated with differences in engagement among male and female learners, with female learners demonstrating significantly higher engagement and positive outcomes in an action civics service-learning program. Aldabbus (2018) further emphasizes challenges such as identifying significant content, the highly time-consuming nature of project-based learning, the demanding nature of project-based learning regarding the monitoring and evaluation of learners, and the lack of resources and facilities needed for project activities. Aldabbus (2018) reports that over three-quarters of participating teachers in their study were unable to implement project-based learning approaches in their classrooms due to these varying challenges.

Another challenge associated with project-based learning is that teachers must adjust to a new instructional approach (Revelle, Wise, Duke et al., 2020). Findings by Revelle, Wise, Duke et al. (2020) indicate that teachers vary in their willingness to adopt project-based learning approaches in their classrooms due to challenges associated with teaching a new curriculum for the first time and not being familiar with their school's community. It is likely, however, that training with an emphasis on project-based learning approaches, which are discussed by Aksela et al. (2019), is a promising strategy to support teachers in overcoming such challenges.

An important challenge to consider when encouraging the embrace of project-based learning approaches is the need for increased teacher training (Melaville, Berg & Blank, 2006). Bencze, Sperling & Carter (2012) highlight how the ways in which teachers are trained is often a limiting factor in the adoption of new instructional approaches, such as project-based learning. In the context of community-based learning specifically, Melaville, Berg & Blank (2006) call to action for state (provincial) leaders to re-evaluate existing professional development programs to

instead emphasize community-based learning approaches to better equip teachers for its implementation in the classroom. This is backed by a study conducted by Aksela et al. (2019), who found that teachers were clearly in need of more training to support their pedagogical content knowledge of project-based learning approaches. A key challenge discovered by Aksela et al. (2019) is that learning to use project-based learning approaches in practice can be a lengthy process, with examples of teachers taking two to three years to shift their understandings while actively participating in training. With this, there is a need for long-term teacher training focused on project-based learning approaches (Aksela et al., 2019). A call to action for increased training goes beyond in-service teachers, as it is emphasized by Aksela et al. (2019) that project-based learning is a pedagogical approach that should begin in pre-service teacher training.

Conclusion

As evidenced through this literature review, project-based learning approaches boast many positive outcomes for learners and even the larger community. Noteworthy outcomes include the acquisition of skills, improved engagement and initiative in the classroom, increased self-efficacy and an increased likelihood of engaging in community action (Juanengsih, Mahmudah & Ruri, 2018; De Beer, 2019; Reid-Griffin, Sterrett & Stanback, 2020; Hart & Wandeler, 2018). These outcomes have important implications not only for learning but also for future workplaces and, of course, the ability to contribute to meaningful change in the broader community (Juanengsih, Mahmudah & Ruri, 2018). To reap the benefits of project-based learning activities, it is, of course, imperative that this pedagogy is implemented effectively by teachers (Andolina & Conklin, 2020). The literature emphasizes the importance of teachers providing learners with choices in project topics and design, aligning projects with real-world contexts, and creating a learning environment that is supportive and fosters a culture of collaboration (Andolina & Conklin, 2020; McWilliams, 2019; Melaville, Berg & Blank, 2006). Many of the barriers to implementing project-based learning activities in a classroom relate to

individual teacher attitudes and beliefs, which can likely be overcome through increased training focused on project-based learning pedagogies for both in-service and pre-service teachers (Revelle, Wise, Duke et al., 2020; Aksela et al., 2019). The way in which a teacher is trained has a lasting impact on the likelihood of a teacher adopting new instructional approaches, including project-based learning; thus, it is imperative that teachers are exposed to this pedagogy early on in training (Bencze, Sperling & Carter, 2012). It is hoped that resource bundles featured in the Change Maker Series can support teachers in overcoming some barriers to implementing this instructional approach and contribute to the widespread adoption of project-based learning approaches that empower future change makers.

Chapter 3: Methodology

Conceptual structure

The development of the Change Maker Series, and hence the two resource bundles *Abraham Francis: A Voice for the River* and *Stephany Hildebrand: Framing the Environment,* followed a similar conceptual structure as Youth Ottawa's (2017) Active Citizenship Initiative (formerly DILA program). I volunteered as a facilitator of this program during my undergraduate degree to gain experience prior to applying for a Bachelor of Education, and my pedagogy has since been influenced to favour project-based learning. I found the project-based learning approaches in the Active Citizenship Initiative compelling, especially while witnessing grade ten learners so engaged. This interest in project-based learning was also influenced by the pedagogy of professors in the MEd program. Throughout MEd courses, many learning activities entailed projects that connected to real-world contexts, such as climate change and outdoor learning pedagogy. If learning through connecting to real-world contexts is engaging to me, I'm sure it will be engaging for other learners, too.

Background: Active Citizenship Initiative

The Active Citizenship Initiative is a unique program in which grade ten students embark in a civic action project to address an issue of interest in their community, guided by a facilitator (Youth Ottawa, 2017). In this program, facilitators visit the same classroom once a week for eight weeks to guide students through the process of identifying an issue of interest, deciding what civic tactics should be implemented, creating a project action plan, and supporting learners in implementing their projects at a community scale (Youth Ottawa, 2017). Through this program, I have witnessed learners develop the skills, knowledge and empowerment to meaningfully contribute to change in their communities. The Change Maker Series employs a similar

conceptual structure to the Active Citizenship Initiative, as learners often identify an issue of interest and take part in a project to address said issue, guided by their teacher and inspired by the story of the featured change maker.

Methods

The development of each resource bundle in the Change Maker Series includes four main phases: 1) identifying a change maker; 2) collaboratively creating a narrative; 3) writing up the case study story; 4) designing the project-based learning activity; and 5) extra components.

Phase one

Phase 1) identifying a change maker entails finding an individual that meets a variety of criteria. This criterion includes ensuring an individual clearly contributes to making positive change in their community or area of expertise related to the environment and/or aquatic ecosystems in some way to account for the themes of the Great River Rapport in which the Change Maker Series is a part. An effort is also made to review an individual's online activity to account for a positive online presence, followed by reflecting on whether or not this individual has enough of a story to tell in the case study. For the two specific resource bundles included in this portfolio, *Abraham Francis: A Voice for the River* and *Stephany Hildebrand: Framing the Environment,* extra consideration was made to account for including more diversity in age, culture, and discipline in an effort for the Change Maker Series to relate to a broader range of learners. Once a change maker is identified, they are contacted and invited to be a Great River Rapport Change Maker.

Phase two

Phase 2) Collaborating with the change maker entails meeting with the individual to discuss the narrative of their story and the structure of their project-based learning activity. The intention is for the creation of each resource bundle to be collaborative in nature, to authentically capture the essence of the individual being featured. To guide discussions, I begin

by asking the change maker a series of questions about their past, work, goals, and inspirations. Answers are used to help guide the writing of the case study and, at times, also entail reading and/or watching videos that already exist about the individual and their work. After co-creating a narrative for their case study, I also asked the change maker what type of project-based learning activity they envision to complement their story, which aims to have learners essentially model their actions. To provide context for the individual, I provide examples of project-based learning activities featured in other resource bundles and provide suggestions based on our prior discussions about their case study. It is vital that the narrative of the case study is decided prior to the design of the project-based learning activity to ensure the two components complement one another to effectively provide enough context for learners.

Phase three

Phase 3) writing up the case study story is often the longest phase in the process of creating a resource bundle. Using the answers and discussions from phase 2, I create an outline for the story about the featured change maker. Each case study has consistent sub-headings throughout to provide context to learners. Subheadings include an introduction, biography, change making actions, unique sub-heading specific to the featured individual's work, and conclusion. Within each subheading, an effort is made to highlight similar concepts and maintain similar lengths across the series of case studies. The intention behind consistency across all case studies is for educators and learners who use several Change Maker Series resource bundles to become familiar with the structure and create opportunities for making connections or identifying differences among the series of stories. In addition to consistent subheadings, case studies also feature 'keywords.' These are terms that are bolded throughout stories which have definitions at the bottoms or sides of pages to support vocabulary expansion or to describe specific places or things. Examples of 'keywords' include a definition of settler-colonialism in Abraham Francis' case study and Environmental Technician in Stephany Hildebrand's case

study. These terms are also intended to support making resource bundles cross-curricular and applicable for grades 7-12. To identify terms as 'keywords,' I reflect on their perceived difficulty to define and understand, a term's importance to the overall context of the story and consider curriculum links for grades 7-12.

Phase four

Phase four, designing the project-based learning activity, entails considering the featured change maker's actions and discussions from phase 2 to create detailed lesson plans to guide learners through a project-based learning activity. As with the case study, the structure of lesson plans is consistent across the Change Maker Series. Each lesson plan has a minimum of six components. This includes an overview, in which a brief description of the learning activity is provided, along with objectives, a list of needed materials, and the time needed. Although at the beginning of the lesson plan, this component is the last to be written. Following the overview is the lesson plan itself, which is subdivided into at least four parts. The lesson plan is uniquely designed to be clear and succinct for educators and is divided into; 1. *Read,* 2. *Class discussion prompts,* 3. *Watch,* and 4. *Be the Change Maker.*

Part 1. *Read* provides two options for educators; read the case study story to their class, noting bolded key terms, or assign learners to read the case study story independently. Providing two options is intended to support these materials being used by a variety of grade levels. Part 2. *Class discussion prompts* usually entail three prompts for educators to provide learners to engage in reflection about the case study story and what it means to be a change maker. An example includes, "What actions could you take to be a change maker in your community"? Part 3. *Watch* provides a link to a video about the featured change maker that is freely available to access online. Videos vary from recorded presentations that already exist online or short videos produced in-house through the Great River Rapport project. For Abraham Francis' resource bundle, a video of a presentation he provided is featured, and for Stephany Hildebrand's resource

bundle, a video she created to teach learners about photography techniques is featured. The intention behind the use of videos in the Change Maker Series is to further engage and empower students through hearing directly from the featured change maker and providing more context prior to beginning the project-based learning activity. Part 4. *Be the Change Maker* entails steps for educators to follow to facilitate the project-based learning activity. The first line in this part of the lesson plan is to *explain to students that it is their turn to be the change maker* to re-emphasize the goal behind the activity (to empower future change makers). This is followed by between 2-4 main steps and, finally, the assignment's criteria. Throughout the entire lesson plan, there are key points labelled as *tips* which are accompanied by a short line to recommend ways to further engage learners or provide possible modifications. The intention of tips being provided throughout lesson plans is to accommodate the circumstances and learning goals of as many classrooms as possible.

Phase five

Phase five, extra components entail a variety of components throughout the entire resource bundle to further extend learning and ease for educators to implement featured project-based learning activities in their classrooms. Within the lesson plan, extra components include extensions and modifications, handouts, and rubrics. The extensions and modifications are bullet points that highlight strategies to implement project-based learning activities beyond the classroom or to modify the project-based learning activities based on the needs of their unique learners. A very exciting and unique feature of the Change Maker Series is that some featured change makers have provided the option for educators to contact them to share their projects or to provide an update about their work. A rubric that follows the four-level grading system is also provided at the end of each lesson plan to provide educators with the option to grade learners on their project-based learning activity. Finally, some resource bundles also feature handouts for learners. Handouts vary greatly among resource bundles within the series and can include project

planning sheets and information sheets with the aim of supporting learners in completing their project-based learning activities. The addition of handouts and rubrics in resource bundles are intended to ensure this series provides all required resources for educators to effectively implement project-based learning activities in their classrooms with ease, while also meeting curriculum requirements.

Design of resource bundles

A final and arguably critical piece to the Change Maker Series' ability to engage learners and make the lesson plan easily digestible for educators is the design of the resource bundle. Fortunately, through working with the Great River Rapport team, I have access to the talents of a visual communications specialist. This individual takes the case study story and uses photography and strategic placements of paragraphs and keywords to create layouts that are interesting to look at, mimicking that of a magazine. The lesson plan, as well, follows a consistent visual design to place information in a way that makes it clear, easy to follow and digest for educators. Although not typically thought of as a critical piece to education resources, the design of these resource bundles is arguably the first step of engaging with both learners and educators.

Final steps

After all the steps described above, a final and important step is required: allowing the featured change maker to review the entire resource bundle. The collaborative nature of the development of the Change Maker Series is honoured through ensuring that featured individuals are pleased with the narrative of the story being told, photos being used, and the project-based learning activity being facilitated. If an individual would prefer to have any aspects changed, there is a discussion to ensure the change is understood and then the changes are implemented prior to the launch of the resource bundle.

Self-examination as an Environmental Education Curriculum Designer

Although the intention of Change Maker Series is to empower others to learn and be future change makers, I also learned a great deal as the designer of these materials. In critically thinking about the pedagogies that influenced these materials, I've discovered what pedagogies I resonate with most. The first few resource bundles in the Change Maker Series were designed and developed without consideration for how different environmental education pedagogies could be influential. After engaging with the development of these materials in a way that considers different environmental education pedagogy, I have found that I resonate deeply with Land-based environmental education and activist education (Korteweg & Russell, 2012; Niblett, 2017). Beyond the design of the Change Maker Series resource bundles, these pedagogies have also influenced my instructional strategy in my teaching roles. I've learned that effective instructional strategies do not always need to entail a fancy lesson plan and formal activities. Effective instructional strategies can and should include encouraging learners to slow down to connect with nature, allowing nature to be first teacher (Styres, 2011). I have also learned that activist pedagogy can be easily integrated into almost any instructional approach (Niblett, 2017). In my environmental science courses at St Lawrence College, I teach learners about environmental facts and concepts, often followed by providing actions that they can do to contribute to change related to protecting the aspect of the environment being highlighted. Although this does not always entail a complete learning activity in which I guide learners through a project-based learning activity, which Niblett (2017) emphasizes as often being a part of activist pedagogy, this instructional approach is still helping learners to understand their ability to contribute to real change.

Through the design of these resource bundles, I've also reflected on my relationality with Indigenous Knowledge holders, such as Abraham Francis. As a white settler educator, I approached the writing of Abraham's story with sensitivity and deep care. While writing first

drafts of the stories about other change makers in the series, I would have the file available on a file-sharing platform and have several co-workers review and provide feedback. Given the sensitive nature of Abraham's story, however, only myself and one co-worker that I know Abraham trusts were involved in and had access to the file in its early stages until Abraham was able to review and provide edits and approval. The knowledge and stories that Abraham shared with me and my co-worker are not for all to hear, so I made sure that I did not risk adding too many personal details. I also learned that the language used to describe Abraham and his experiences matters and that the terms that Abraham prefers are personal to his lived experiences and culture and not that of all Indigenous Peoples in Canada.

Designing these resource bundles has also prompted me to reflect on the National Truth and Reconciliation Commission's (TRC) 49 Calls to Action as a white settler educator (TRC, 2015). Although these materials are a good step in supporting the achievement of calls to action related to education for reconciliation, I can see that there is still much work to be done in Canada regarding reconciliation generally and in the context of education (TRC, 2015). This exercise has also prompted me to reflect on how important it is that I, as a white settler educator, actively and openly participate in calls to action set out by the TRC (2015) as a model for learners. This modelling can include being mindful of the language I utilize to discuss and refer to Indigenous communities, cultures and knowledge, as well as my everyday actions, such as continuing to learn about and acknowledge the harms of settler colonialism and referring to the TRC's calls to action in my classrooms (TRC, 2015). If I expect learners in my classrooms to be settler allies, I must ensure that I am, too. Generally, through designing and developing these two resource bundles for the Change Maker Series, I feel even more empowered to be a change maker myself. I have accomplished creating useful resource bundles to help others (learners) become change makers, but now it is my turn to be an active change maker by taking action for social and environmental issues in my community.

Chapter 4: Resource Bundles

Great River RAPPORT

Framing the environment

with

Stephany Hildebrand

By Emilie DeRochie
Photos by Stephany Hildebrand

Grades: 7-12

Subjects:
Media Studies
Science
Environmental Science
Geography
Equity Studies
Civics

Duration:
3-5 hours

Key Themes:
Photography
Storytelling
Environmental justice
Career exploration

Photo by Matt Windle

Shonkwahtsì:’a Enkiehkehnéhka Karáhkwa

(Our Elder Brother the Sun)

Next we acknowledge the Brother Sun for continuously rising from the east and setting in the west, bringing light to each day. In doing so, we give thanks to the Sun for providing us with warmth. So, we turn now to Brother Sun and send our greetings and thanks.

Now our minds are one.

The Thanksgiving Address known as the Ohén:ton Karihwatéhkwen or “words that come before all else”. It is a Haudenosaunee practice for clarity that can be heard during formal settings, such as ceremonies and significant events, but it is also said every morning when the sun rises to acknowledge all that was created, to send gratitude, and to continue to live with a good mind. When we continue to send gratitude to all that was created, the natural elements continue in their natural equilibrium. Thus, we are fulfilling our original instructions to care for all of creation and in return these elements will continue to fulfill theirs.

Illustration by Victoria Ransom

Photo by Dmytro Yarovoy

INTRODUCTION

Do you have a variety of different interests that seem worlds apart? Stephany Hildebrand spent many years pursuing one of her passions, while leaving others to the side. This was until she discovered a career pathway to combine them, leading to new opportunities to create meaningful change.

BIOGRAPHY

When Stephany was young, she lived in the Laurentian Mountains in Quebec. She has fond memories of her family spending countless hours outdoors foraging for edible berries, mushrooms, and cattails. Stephany also remembers catching frogs with her mom and meandering through the forest, taking in all its beauty, sounds, smells, and textures. She doesn't recall ever being bored at this time of her life; there was always something to observe, and explore, however large or small. The attention to detail she developed as a child making observations in nature would later come to benefit Stephany in her career as a **Graphic Designer** and Professional Photographer.

When she was eight years old, Stephany and her family moved to Cornwall, Ontario—a place that felt completely unfamiliar. She was now living in a city and soon longed to get back into nature. In searching for places that felt more like home, Stephany eventually found Guindon Park nearby, a large public park with many nature trails and ponds located just west of the city. Soon, she was visiting the park regularly to watch turtles, frogs, and other creatures, observing how the ecosystem changed through the seasons and from year to year. Although no longer fully immersed in nature like she once was, Stephany remained deeply curious about the natural world and always felt best when exploring outdoors.

Even when not outside in nature, Stephany had the desire to learn about it. While in grade school, she would often tell her mother that she was sick so that she could stay home from school and instead visit the Cornwall Library, where she read books about the **flora and fauna** she found at Guindon Park.

KEY WORDS

Graphic Designer
An individual who combines text and images to help communicate a message.

Flora and fauna
Flora refers to all plant life in a region; fauna refers to all animal life in a region.

Despite her interest in learning about local flora and fauna, Stephany was not very interested in school, and not at all keen on learning math, languages, or science in her classes. School did not seem to uplift her passion for learning in the same way that exploring nature or creating art could. Stephany's learning style was more of an **autodidact**, as a number of the important skills that she now uses in her career are self-taught.

Through her self-directed learning, Stephany became a skilled **naturalist**, but she also had creative interests. When she wasn't out in nature, or reading books about nature, you could find her creating paintings, collages, and sculptures inspired by nature. Eventually, Stephany also became interested in cameras and photography, as well. She loved the way photography provided an instantaneous method of expressing her thoughts through images. She found inspiration documenting the colours and textures of the forest floor, as well as everyday life with her family and their adventures outdoors.

As Stephany was becoming interested in photography, she was also introduced to **social and environmental justice** documentaries such as Manufactured Landscapes, The Corporation, Up the Yangtze, and Le Peuple Invisible. Stephany credits these documentaries with sensitizing her to environmental issues that stem from **capitalism** and **colonialism** and have influenced her to be the artist and advocate that she is today.

In her mid-twenties, Stephany launched her career as a photographer. She worked for a Montreal artist who specialized in luxury artwork and interior design, which provided an opportunity for her to hone her skills and gain experience with photography as a professional. Even with this exciting career, Stephany soon felt that a part of her was missing and that the job did not resonate with her passions and

A sculpture Stephany made from garbage found in a local forest where Stephany would spend her time as a teenager.

Stephany, her best friend, and her little sister finding and measuring a snapping turtle found at Guindon Park.

KEY WORDS

Autodidact

An individual who teaches themself something, for example a skill like cooking or singing.

Naturalist

An individual who is very knowledgeable about the natural history of a region.

Social justice

The idea that society should be fair and equitable for everyone, this can include the equitable sharing of wealth, privileges and opportunities.

Environmental justice

The idea that everyone should be able to live in a clean and healthy environment.

Capitalism

A political and economic system based on private ownership and competition for profit.

Colonialism

When a country or power uses violence to take control of another country, nation or region and sends people — "settlers" — to live on that land.

Guindon Park, Cornwall, ON

values. At this point in her life, Stephany was feeling disconnected from nature. Although she sometimes dreamed of becoming a nature photographer instead, she didn't feel as though she was talented enough to succeed in that field.

One day, while walking the familiar trails of Guindon Park, Stephany realized how much she was missing her connection to nature. This memorable walk inspired her to make a radical career change and return to school to pursue a diploma as an **Environmental Technician**. At the time, Stephany felt like she had to make a choice between art and the environment, and although this decision meant taking a step away from photography, it was an opportunity to reconnect with nature.

Between the first and second years of her diploma, Stephany got a summer job at the St. Lawrence River Institute, an environmental research, education, and outreach organization in Cornwall. Working for this organization, she saw opportunities to improve their **visual communications** to more effectively communicate scientific findings to the community. This was an **"ah ha" moment** for Stephany—she had found an opportunity to potentially bring together her skills and passions as both an artist and a naturalist. After completing her diploma program, Stephany began working as a field technician, graphic designer, and Photographer at the River Institute. Over the following years, Stephany took on increased responsibility, leading the rebranding and redesign of all aspects of visual communications at the organization. Her work has played a critical role in increasing the popularity and impact of the River Institute's outreach and community engagement work. She finally found a career that granted her the ability to combine photography with her love for nature.

KEY WORDS

Environmental Technician
An individual trained to perform technical fieldwork and laboratory procedures to support environmental projects.

Visual communications
The use of visual elements like photographs, illustrations and videos to communicate a message, make people feel an emotion and/or inspire people to do something.

"ah ha" moment
A moment when a person suddenly understands a concept or sees a new solution to a problem

CHANGE MAKING ACTIONS

Stephany is a Change Maker in her community because of her ability to tell meaningful stories through photography and visual communications. Her goal is to uplift the work of scientists and community members through beautiful imagery that will inspire others. She believes that the ability of nature to renew and rebound is powerful and that sharing the sensitivity and strength of the natural world can motivate people to make change.
In her position as a Graphic Designer and Photographer for the River Institute, Stephany translates complex scientific concepts and findings into visuals for research projects like the **Great River Rapport**, that are easier to understand and more interesting to read. Through her design and images, Stephany communicates both key information and evokes strong emotions. Stephany's goal is to promote better understanding of the natural world, while also encouraging audiences to care about issues and feel motivated to act.


Photo by Courtney Holden

Stephany also uses her unique abilities as a photographer and visual communicator to be an **advocate** for nature and non-human beings. Of particular interest to her is the **American Eel (Anguilla rostrata)** a long, slender freshwater fish that are often thought of as creepy, or as a nuisance, but for Stephany they are beautiful and inspiring animals. American Eels have remarkable life cycles, beginning and ending life in the Atlantic Ocean. When they are young, female American Eels migrate upstream to **brackish** and freshwater habitats, including Lake Ontario, where they can spend up to 20 years growing before starting their return migration to spawn.

Today, however, American Eels are in serious trouble. Their populations have declined by approximately 99% in the past few decades because of pressures such as over-fishing, and hydroelectric dam turbines, which kill and injure eels during their downstream migration back to the ocean. Stephany has found dead and injured eels washed up along the banks of the river near the base of the dam, a sight that made her feel deeply upset. She has since become passionate about sharing this story with the world and encouraging others to get involved in helping to protect the remaining population. Stephany shares the story of the American Eel by being a voice for the eels and using her photographs to help people connect with and understand their story.

KEY WORDS

Great River Rapport

An ecosystem health report that focuses on the health of the Upper St Lawrence River
www.riverrapport.ca

Advocate

An individual who publicly supports a specific cause.

Brackish

Water that is slightly salty and can include the aquatic ecosystems where a freshwater river and seawater meet in estuaries such as the Gulf of the St Lawrence.

American Eel (*Anguilla rostrata*)

A long-bodied, slender fish that spends most of its life cycle in freshwater and mates in the Sargasso Sea at the end of its life. It is a species that is highly significant to the Haudenosaunee Peoples as a food and medicine and is threatened.

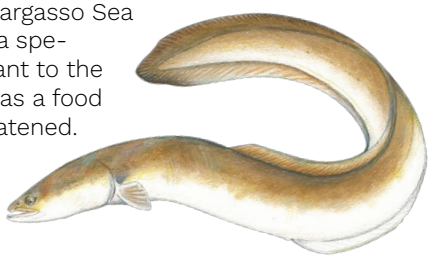


Illustration by Kate Schwartz

In her journey of advocating for American Eels, Stephany has sometimes experienced **imposter syndrome**, but over time she has learned that all types of skills and knowledge are needed when working to achieve change, and that she doesn't need to be an expert to be an effective advocate. She collaborates closely with scientists who are conducting research to better understand threats to eel populations and potential conservation actions. Stephany, in turn, can use her skills in photography and visual communications to bring awareness to the challenges faced by eels and to encourage people to care about these animals.

IMPACTFUL PHOTOGRAPHY

Photography can have a powerful impact on people's perceptions of the environment. It can encourage **empathy** and influence action. An example that Stephany likes to use for photographs influencing action is the photo series by photographer **Chris Jordan**. He documented dead sea birds with stomachs full of plastic. These images, along with others, outraged people across the globe, contributing to a movement to reduce the use of single-use plastics. Without these types of photos, the movement against single-use plastic may not have gained the momentum that it did.

Stephany also emphasizes the power of photographs that show changes over time in a place. She sees this type of photography as an opportunity to bring attention to processes of environmental change, such as climate change. Photography can also be used to simply make people aware of less well-known organisms. For example, when Stephany shows her photos of freshwater sponges to people,

KEY WORDS

Imposter syndrome

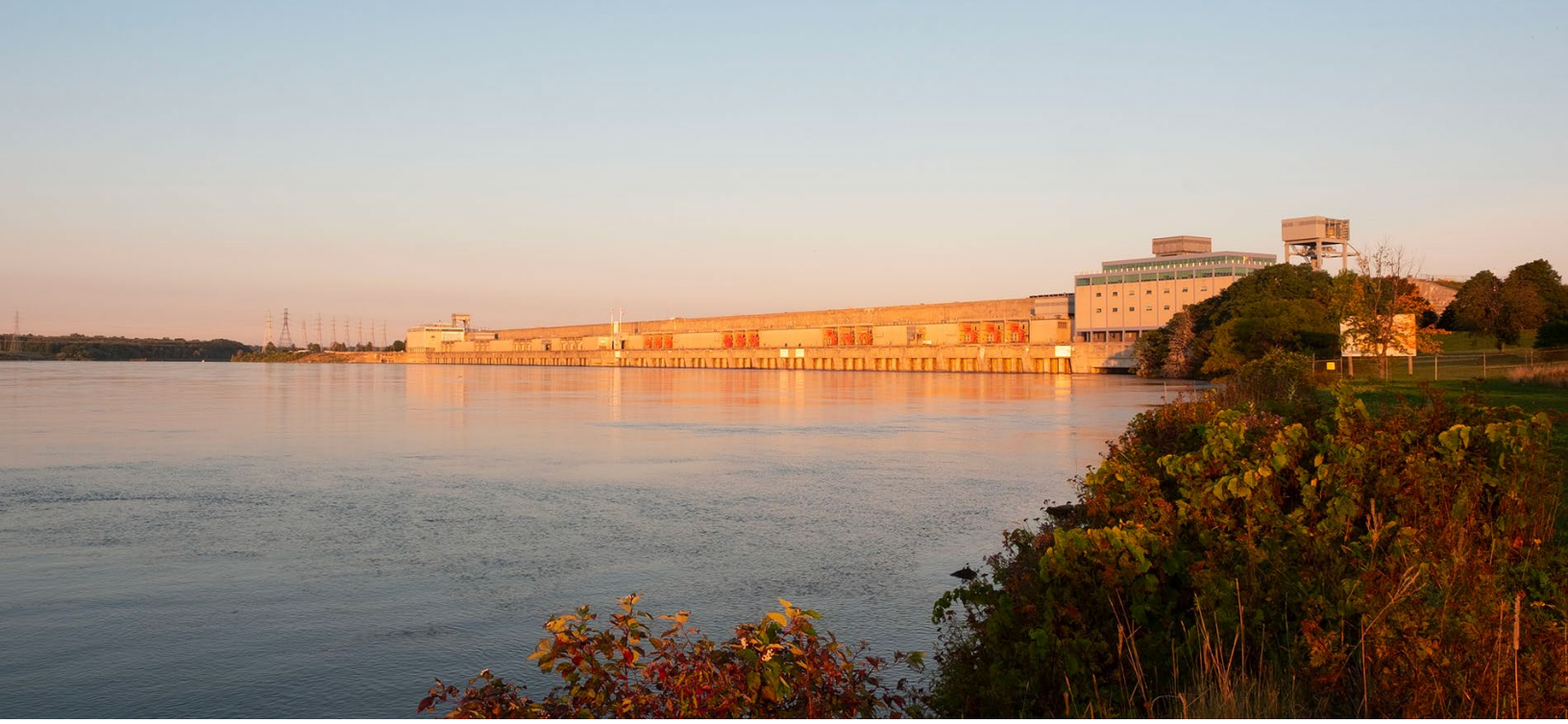
The internal belief that one's success and/or achievements are not entirely deserved, making one feel like a fraud in their successes. It is a common phenomenon for young professionals to experience.

Empathy

The ability to understand and share the feelings of another individual.

Chris Jordan

A well-known photographer and filmmaker that documented photos of dead sea birds with stomachs full of plastics. Contributing to the movement to reduce plastic consumption. *Trigger warning: To read more see: **www.bbc.com/future/article/20230531-the-photo-that-changed-the-worlds-response-to-the-plastics-crisis**



many say that they did not know that they existed. Awareness of these creatures can inspire curiosity and action to protect them.

An element of photography that is very important to Stephany is emotion. An important tool for eliciting emotion in a photograph is the strategic use of lighting. Lighting that is bright and vibrant, for example, can elicit happiness, whereas lighting that is dark or muted can elicit sadness. To illustrate this, Stephany uses the example of two photos that she has of the Moses-Saunders Hydro Electric Dam in Cornwall. In the first photo, the colours are warm and light, making it a good photo to highlight positive elements of hydroelectricity, such as its contributions to reducing greenhouse gas emissions. In the second photo, the colours are cold and dark, making it a better choice to highlight negative impacts of dams, such as their impacts on American Eels. Both photos have the same subject, but the lighting changes the mood completely.

CONCLUSION

Stephany shows that science and art can and should be combined to make positive change in the world. She hopes to inspire the scientific community to invest in high-quality visual communications to better communicate complex scientific and environmental information. One day, Stephany also hopes to create a database for photographers to display photographs of nature in different regions, and to tell stories of ecosystem change over time.

To Stephany, being a Change Maker involves passion, generosity, empathy, curiosity, and a drive to create a better and healthier world – all traits that Stephany embodies and demonstrates daily. She has a unique ability to take information, or a moment in time, and adds her creative touch to make it into something interesting and noteworthy. Change Makers are also often lifelong learners and Stephany continues to grow and learn through **professional development**. She is always open to learning new things and trying out new ideas.

By combining her passion for art and photography with nature and science, Stephany demonstrates that artists can use their creativity to make important contributions to environmental science, and that artists and scientists working together can be a powerful force for making change for the better.

How will you create change through combining your passions?

KEY WORDS

Professional development

Special training or education for individuals who are already working to improve their skills or knowledge.

OVERVIEW: OPTION #1 – WATER TESTING AND REPORT

In this Case Study and Learning Activity students learn about the characteristics of a Change Maker through exploring the actions of Stephany Hildebrand, a graphic designer and professional photographer. After learning about Stephany's many actions as a Change Maker, students learn how to bring awareness to place through photography with a video lesson by Stephany herself. Students demonstrate their learning by producing a portrait of their chosen place.

OBJECTIVES

- Understand that there are many ways for a person to contribute to meaningful change in their community.
- Demonstrate how photography can be used to bring awareness to a natural place.

MATERIALS

- Projector
- Camera (or cell phone)
- Photo editing software

TIME

Between 3-5 class periods (3-5 hours)

LESSON PLAN

1. Read

A) Ask students to read the Great River Rapport's Change Maker Series' *Stephany Hildebrand: Framing the Environment* individually.

or

B) Read the Great River Rapport's Change Maker Series' *Stephany Hildebrand: Framing the Environment* to students, making note of bolded terms and their definitions.

2. Class discussion prompts

A) What makes Stephany a Change Maker?

B) Why is photography important for making change?

C) What skills do you have that you think could be utilized to make change?

---

3. Watch

A) To learn more about photographic techniques, watch this presentation by Stephany:

Photographic Techniques- 27 minutes YouTube

https://www.youtube.com/watch?v=VqW6DC0eRes

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4. Be the Change Maker

A) Explain to students that it is their turn to be the Change Maker. Task students with choosing a place in nature that interests them and then taking time to get to know this place by exploring and observing it.

Tip:

The place in nature can be anywhere, from a ditch on the side of the road to a pristine lake.

B) Once the students have made their choice, ask them to photograph this place using photographic techniques discussed in the case study and video.

C) Using tips provided in the case study and video, students will produce their own portrait of their chosen place.

Tip:

Have students explore a variety of photo editing software! Many free, easy-to-use options exist and can be used on a computer or cell phone.

Example

- Canva Photo Editor

5. Assignment

Bring awareness to a place by producing a portrait of a landscape!

Portrait Criteria

- Includes between 10 and 20 photos.
- Includes a diversity of photographs, demonstrating techniques discussed by Stephany such as a mixture of portraits, details, and scene photos.
- Demonstrates a thorough exploration of their chosen place.
- Photographs answer the 4 key questions: who, what, where, when?
- Is presented in an interesting way to catch the attention of their audience?

  Tip: Allow students to present their visual portrait in a format of their choosing, such as a slideshow, tik tok, Instagram post, video, etc.

- Includes a clear and succinct caption (between 2-5 sentences) of the place.

  Tip: Explain to students that the caption can include where the place is, why they found it interesting, or why they thought it needed to be photographed, for example.

TIPS:

- Encourage your students to research the organisms in their photographs and list what they are in the caption – giving names to what is seen helps an audience connect with the subject
- Give students some time outside to decide on a subject on which to focus their photography. For inspiration, see Stephany's photography website: **https://stephanyhildebrand.visura.co/**

Extensions and modifications

- If learners are constrained by time, ask them to submit just one photograph, instead of 10-20 photographs.
- Contact the Great River Rapport team to schedule a virtual meeting with Stephany to learn more about her work, gain insightful photography tips, and learn about her most recent projects.
- Encourage students to post their visual stories to social media platforms to begin creating real awareness for their chosen place.
- Host a gallery walk in your classroom to encourage students to share their work with the school community.

TIP:

Have students respond to discussion prompts as an exit ticket or in journals.

Vocabulary

- Graphic Designer
- Flora and fauna
- Autodidact
- Naturalist
- Social justice
- Environmental justice
- Capitalism
- Colonialism
- Environmental Technician
- Visual Communications
- Advocate
- Brackish
- American Eel (Anguilla rostrate)
- Imposter syndrome
- Empathy
- Professional development

RUBRIC

	Level 1	**Level 2**	**Level 3**	**Level 4**
Subject and story	Portrait shows limited elements of the place, bringing limited awareness to subjects that are often overlooked	Portrait shows some different elements of the place, bringing some awareness to subjects that are often overlooked	Portrait shows different elements of the place, bringing awareness to subjects that are often overlooked	Portrait emphasizes different elements of the place, clearly bringing awareness to subjects that are often overlooked
Caption	Caption lacks clarity and is lengthy or too shore, and demonstrates limited personal connection to place	Caption is somewhat clear and succinct and demonstrates some personal connection to place	Caption is clear and succinct (between 2-5 sentences) and demonstrates a personal connection to place	Caption is very clear and succinct (between 2-5 sentences) and demonstrates a deep personal connection to place
Photography style	Visual story does not demonstrate the application of photography principles outlined in the case study and video	Visual story somewhat demonstrates the application of photography principles outlined in the case study and video	Visual story demonstrates the application of photography principles outlined in the case study and video	Visual story demonstrates the outstanding application of photography techniques outlined in the case study and video
Quality	Visual story demonstrates limited aesthetic and written quality	Visual story demonstrates some aesthetic and written quality	Visual story demonstrates good overall aesthetic and written quality	Visual story demonstrates excellent overall aesthetic and written quality

Great River RAPPORT

A Voice for the River

with

Abraham Francis

By Emilie DeRochie
Photos by Stephany Hildebrand

Grades: 7-12

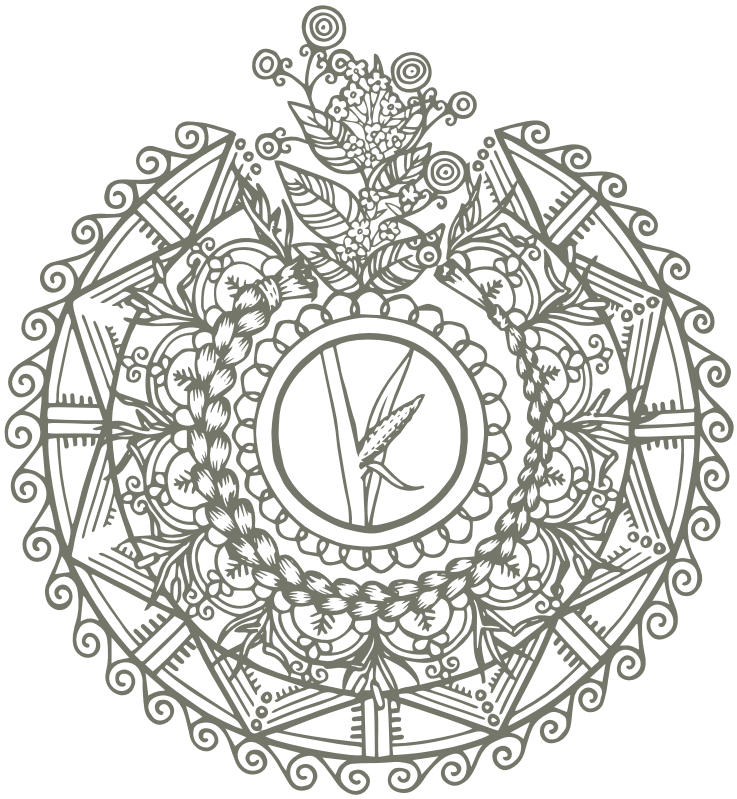
Subjects:
Environmental Science
Geography
Language
Indigenous Studies
Science
Equity Studies
Civics

Duration:
3-4 hours

Key Themes:
Settler-colonialism
Indigenous Knowledge
Environmental justice
Environmental degradation

Desjardins

River INSTITUTE



Ononhkwa’shòn:’a

(Medicines)

We continue to acknowledge the Medicines for aiding us to health when needed. They continue to grow freely and can be picked by those with the knowledge. We acknowledge them as, like many other plants and foods, they continue to follow their original instructions by growing every year. So, we turn now to Medicines and send our greetings and thanks.

Now our minds are one.

The Thanksgiving Address known as the Ohén:ton Karihwatéhkwen or “words that come before all else”. It is a Haudenosaunee practice for clarity that can be heard during formal settings, such as ceremonies and significant events, but it is also said every morning when the sun rises to acknowledge all that was created, to send gratitude, and to continue to live with a good mind. When we continue to send gratitude to all that was created, the natural elements continue in their natural equilibrium. Thus, we are fulfilling our original instructions to care for all of creation and in return these elements will continue to fulfill theirs.

Illustration by Victoria Ransom

INTRODUCTION

How do you advocate for your community? Abraham Francis combines his pride for being **Kanien'kehá:ka (Mohawk)**, love for his community of **Akwesasne**, and passion for the **Kaniatarowanenneh (St Lawrence River)** to be an advocate for change and **empowerment** of all **Haudenosaunee** communities.

KEY WORDS

Kanien'kehá:ka (Mohawk)

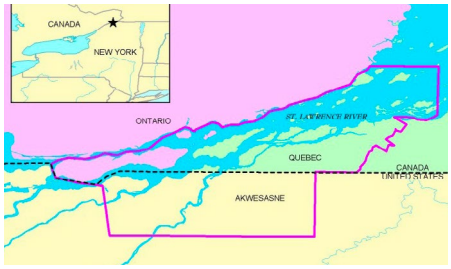
Kanien'kehá:ka is a Mohawk term that translates to "People of the Flint" and is a term used to refer to the Mohawk people.

Kaniatarowanenneh

Kaniatarowanenneh is a Mohawk term that translates to "the great waterway". The river that is now known as the St. Lawrence River was given this name because of its size and power.

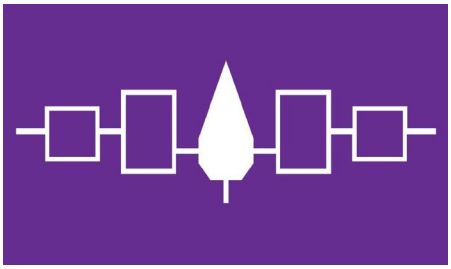
Empowerment

To support individual(s) to feel more confident, able, and motivated in their capabilities



Akwesasne

Akwesasne is a Mohawk community of the Haudenosaunee People, which has extensive traditional territory that includes the St Lawrence River. This territory has Canada to the north and the United States of America to the south; and falls within the Canadian Provinces of Ontario and Quebec; and the American State of New York.



Haudenosaunee

Haudenosaunee is a term that is often translated as "People of the Long-house," and refers to the people of the Haudenosaunee Confederacy, an alliance of six nations in what is now known as North America, along the St. Lawrence River, connected by the Kain-aerekowa (Great Law). Each nation has its own identity and language. These nations include Mohawk, Oneida, Onondaga, Cayuga, Seneca and Tuscarora.

BIOGRAPHY

There are many important pieces to the identity of Abraham Francis. Abraham is **Wakenón:wat (two-spirit)** and Wakeneniothró:non (deer clan), born and raised in the Kanien'kehá:ka community of Akwesasne. He is the second born of five children in his family. Abraham has fond memories of gearing up in his little rubber boots and exploring the **ecology** of the Kaniatarowanenneh (St. Lawrence River) at the edge of Rakosai Point under the watchful eye of his Father's Francis family.

Influenced by his time exploring the river's tiniest details as a child, Abraham developed a passion for discovery and learning, which later led him to briefly leave his community after high school to pursue a Bachelor of Science in Biology with a concentration in Microbiology. His love for microbiology was a byproduct of his amazement at how an entire world could exist at the tip of his finger, and he could not see it. Additionally, he hoped it could be used to remediate the pollution in his community because certain bacteria can break down pollutants. Following his degree, he found the **Environment Program at the Mohawk Council of Akwesasne**, where he learned how to incorporate Haudenosaunee perspectives into science. This led him to pursue a Master of Science in Natural Resources where he focused on Haudenosaunee perspectives for Forest Stewardship; emphasizing the value and insight of the Mohawk community to conserve and protect the environment. His thesis was a celebration of his community's connection to and knowledge of forests that opened up insights on how to care for creation in a manner that is consistent with Haudenosaunee values and teachings.

KEY WORDS

Wakenón:wat (two-spirit)
An individual who embodies both a masculine and a feminine spirit.

Ecology

Environment Program at the Mohawk Council of Akwesasne
The Environment Program strives to better understand, protect, maintain, and enhance the natural environment of Akwesasne and beyond. The Environment program works on a variety of environmental research and conservation projects and are committed to sharing knowledge of the environment through education and connecting with the community.

After graduating, Abraham began working again for the Mohawk Council of Akwesasne Environment Program again as the Environmental Science Officer where he could put his thesis into practice. Here, he continued to be **mentored** by fellow Haudenosaunee leaders in environmental protection, Peggy Pyke Thompson and Henry Lickers, who encouraged him to be an advocate for his community and the environment. Within two years, Abraham became the Manager of the Environment Program at the Mohawk Council of Akwesasne. This work was exciting and very interesting to Abraham, as he was working in his community, for his community and the environment. As with many other Indigenous organizations, the Environment Program at the Mohawk Council of Akwesasne had a heavy workload, as he and his team were flooded with propositions from other, non-Indigenous organizations to partner on projects, in addition to their own work. After much deliberation about how he could best serve his community, Abraham applied to pursue a PhD in Environmental Science and Engineering, which also led him to founding the **Aronia Collective**. Abraham wanted to gain a deeper understanding of barriers that affect the ability of Indigenous Communities to care for their environments in ways that are consistent with their culture, as well as come up with a toolbox to help their own and other Indigenous Communities! Since long before he was born, Abraham's family had a deep relationship with the Kaniatarowanenneh. Being Kanien'kehá:ka, the river is more than an aesthetically pleasing water body, as it is to many settlers, but a significant **ecosystem** that represents life, ceremony, food, and the **interconnectedness** of all living beings.

Although Abraham has a deep love and respect for the river, this water body also reminds him of a long, complex, and violent history of **settler colonialism**. The community of Akwesasne has been subject to

KEY WORDS

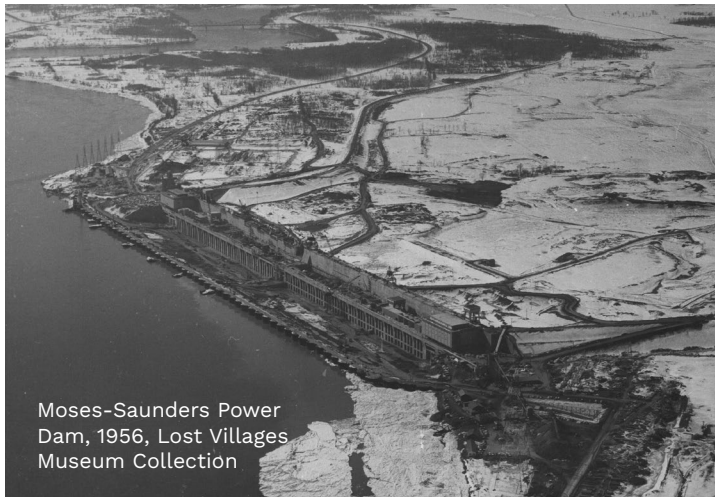
Mentored
A trusted individual who provides advice and/or training to help someone succeed. Usually, a mentor is older or more experienced than the mentee (person being mentored).

Aronia Collective
Abraham's own consulting business

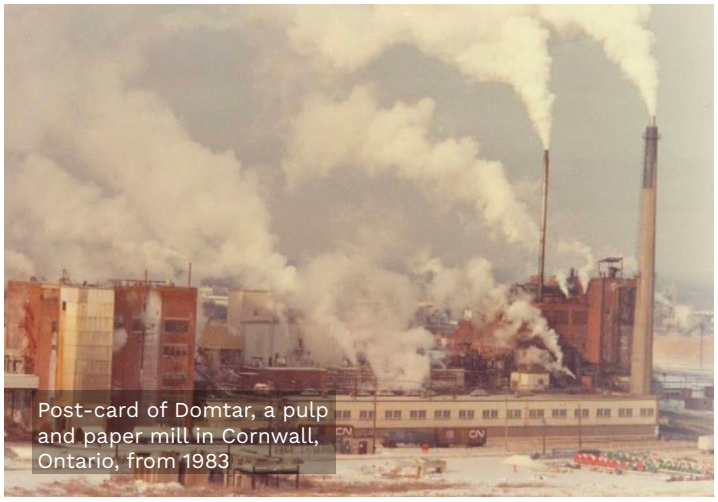
Ecosystem
All the living (biotic) and nonliving (abiotic) things in an area, including plants, animals and materials like water, rocks, soil, and sand. A river, a swamp, and a forest are all examples of ecosystems.

Interconnectedness
The notion that everything, from the smallest, simplest organisms to the largest and most complex are all connected to one another in some way.

Settler colonialism
Worldviews that are based on ideologies and practices imposed by European settlers.



Moses-Saunders Power Dam, 1956, Lost Villages Museum Collection



Post-card of Domtar, a pulp and paper mill in Cornwall, Ontario, from 1983

ALCOA, an aluminium factory

harms imposed by settler-colonialism such as the development **St Lawrence Seaway** and **Moses-Saunders Hydro-Electric Dam**, **legacy industrial pollution**, and a loss of relationship and connection with the river.

The development of the St Lawrence Seaway and Moses-Saunders Hydro-Electric Dam entailed a large amount of **dredging** at the bottom of the river to ensure it was deep enough to allow large cargo ships to pass. This dredging destroyed the **spawning grounds** of significant fish species, such

KEY WORDS

St Lawrence Seaway

Often referred to as a marine highway, the St. Lawrence Seaway is a specific pathway for cargo ships along the St. Lawrence River from the Atlantic Ocean up into Lake Eerie. The St Lawrence Seaway includes a series of structures called locks that allow ships to climb 75 meters above sea level! The development of this marine highway also required major alterations to the natural river ecosystem in some areas to let large, deep-bodied cargo ships pass through.

Moses-Saunders Hydro-Electric Dam

A hydro-electric dam is a large structure built across a river to produce electricity and regulate water flow. The dam holds large amounts of water behind it and forces water to pass through machines called turbines that generate electricity. The Moses-Saunders Hydro-Electric Dam was built across the St. Lawrence River and the border between Canada and the United States. To build this dam, large areas were flooded, with many societal impacts including over 6,000 people relocated from their homes.

Legacy industrial pollution

Pollution caused by industrial activities, such as factories, that release chemicals into the environment, harming the surrounding ecosystem.

Dredging

The removal of material, usually sediment or vegetation, from a water environment.

Spawning grounds

A place where animals, such as fish, lay and fertilize eggs.

as **Teiotién:taron (Lake Sturgeon)**, an important food source among the Mohawk People, and the excess sediments were often dumped on Mohawk land. The building of the Moses-Saunders Hydro-Electric Dam also had significant impacts, such as altering the river's flow, impeding the **migration** of many fish species, and causing mass injuries and mortality to the culturally significant **Tiawerón:ko (American Eel)**. The community of Akwesasne is also near a lot of industrial activity. This industrial activity has polluted local ecosystems, including the Kaniatarowanenneh, leading to the community of Akwesasne being advised to limit or cease fish consumption back as 1979. This harm has led to changes in the community, leading to many community members no longer engaging in traditional harvesting practices, such as fishing, and a loss of connection to culture in the community - damage to the land is damage on the people and culture.

Abraham loves his community and culture deeply and felt compelled to help his community engage with the river like they once did before the harms of settler colonialism. Abraham envisions a future that has a flourishing environment and provides his community with food, ceremony, and deep connection to the land and water. To help preserve his vibrant culture, Abraham needed to start at the source; protecting the Kaniatarowanenneh.

KEY WORDS

Teiotién:taron (Lake Sturgeon)

A large, freshwater, bottom-feeding fish. Lake Sturgeon has been fished by the Haudenosaunee People since time immemorial. These fish are often caught on night lines and prepared by being smoked. This species has declined in the St Lawrence River and is now considered a threatened species.

Migration

When an animal travels from one area to another based on seasonal or life cycle changes.

Tiawerón:ko (American Eel)

A long, slender fish with a snake-like body that is of great significance to the Haudenosaunee People. This fish is caught for the consumption of smoked eel, as well as for medicine, as its skin has medicinal properties. One of the clans of the Haudenosaunee People is the Eel Clan.

Illustration by Kate Schwartz

CHANGE MAKING ACTIONS

Abraham Francis engages in a wide variety of change-making actions to help his community engage with the river as they once did. These actions include advocating for his community, developing frameworks and plans, providing cultural awareness trainings, developing and implementing research projects, and speaking at various events to bring awareness to issues close to his heart.

Around the time that Abraham was coming to understand his own two-spirit identity, he took a position as a prevention/intervention coordinator for the Mohawk Council of Akwesasne. Through this position, he worked and developed a passion to create safe spaces for vulnerable **2SLGBTQQIA+ Akwesasronon** youth. Although no longer in this position, Abraham continues to advocate for 2SLGBTQQIA+ voices wherever possible in his day-to-day work. Youth motivates much of what Abraham does, as he hopes to help create a world in which Indigenous youth feel valued and **empowered**. In his many meetings, he can be found speaking with and uplifting the Indigenous youth in the room. Abraham's mentors were instrumental in helping him realize his path, and he hopes he can provide support to the youth whom he mentors. He aims to especially help young Indigenous scholars embrace their culture and be cognizant of settler-colonial influences in research practices.

One of Abraham's goals in his work is also to hold systems and people, such as industries, **accountable** for the damage they have caused to the river and his community. In working through this journey, Abraham stumbled across a group called **Talking Rivers**. Early in his interactions with this group, he was approached to help advocate for the Rights of Rivers. At first, Abraham was skeptical of this idea. In thinking about the rights of nature from a Haudenosaunee perspective, Abraham did not think we should assign rights to the environment. To the Haudenosaunee people, everything has roles and responsibilities to each other, which means they already have agency and rights. As he learned more about it and the impact it could have for reducing harms on the river, Abraham soon embraced the idea. He is now the vice-president of Talking Rivers' board of

KEY WORDS

2SLGBTQQIA+

This acronym means individuals who are two-spirited, lesbian, gay, bisexual, transgender, queer, questioning, intersex, asexual, and all other sexual orientations and genders.

Akwesasronon

Akwesasronon is a Mohawk term that means an individual from the community of Akwesasne.

Accountable

The act of accepting one's responsibility

Talking Rivers

Talking Rivers is a non-profit organization that weaves together communities across the Upper St. Lawrence River / Kaniatarowanénhne and Adirondack Watersheds, advocating for the Rights and Rites of Rivers and their Ecosystems. Through art, storytelling, and community conversations we strive to educate our human neighbors about the Roles and Responsibilities we have towards the rivers that unite our communities.

www.talkingrivers.org/rights

RIGHTS OF RIVERS

In settler-colonial society, people have rights, but a river is not a human, so how can a river have rights? After speaking with the founders of Talking Rivers and opening his mind to the potential of this movement, Abraham began to understand that giving rights to rivers is a **call to action** for communities to realize that these vital ecosystems have their own right to exist, flourish and thrive. Finding a way to give rights to rivers is based on how the current legal system is failing the river by allowing it to be harmed and **exploited**. The main failure contributing to these harms is the widespread adoption in settler-colonial society that nature is considered human 'property'.

Rights of Rivers aims to hold the people surrounding these ecosystems accountable to advocate for the river. After all, our welfare as people is linked to the river's welfare. This movement aims to unite communities to create an ecocentric governance system for rivers to be considered in their own right and protected.

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KEY WORDS

Call to action
A request or encouragement to perform a specific act.

Exploited
To make full, extractive use of a resource.

Ecocentric governance
A political system that is centered on nature, viewing humans as a part of nature and non-human nature as having its own intrinsic value.

So, how does one uphold their responsibility to the river? Talking Rivers presents seven calls to action through the Great Rivers Bill of Rights and Responsibilities:

1. Respect the rivers natural cycles and processes
2. Acknowledge our ecological duty to advocate for the river
3. Monitor the health of the river, their watershed and natural communities
4. Collaborate with our fellow stewards to preserve and restore the river
5. Nurture **reciprocal relations** that foment healthy human and natural communities
6. Work in harmony with the natural communities that make up the watershed
7. Protect the ability of the river to fulfill their roles and responsibilities to all the natural communities that make up their watershed

Abraham's own expression of these calls to action is through three main ideas:

1. The rights of the river to community
2. To be seen and heard
3. To be cared for

Abraham explains that these calls to action are nothing new to the Haudenosaunee People, as they have had the responsibility of being stewards of the river since time immemorial. It is time for the rest of us to act, too.

KEY WORDS

Reciprocal relations

Relationships in which two or more individuals or groups give back to one another.

CONCLUSION

In looking to the future, and in addition to contributing to the achievement of rights being given to rivers, Abraham hopes to address the need for meaningful relationship-building across Indigenous communities by developing a Haudenosaunee Network. He aims for this network to extend across the international border, gathering individuals from all Haudenosaunee communities to create a space for discussion on community-specific issues, develop a Haudenosaunee research agenda, and identify ways to support one another. Abraham hopes an Indigenous research institute can be born from this network. He aspires to create a space that is safe, accessible, and non-judgmental to perform meaningful research that is conducted by the Haudenosaunee people and for the Haudenosaunee people. To explain his vision, Abraham likes to refer to this research institute as a space that will "smell of medicine"; it will be a space intended for collective healing from the harms imposed by settler colonialism and resist the harmful norms of western research practices to allow for the liberation of his people.

To Abraham, a change maker is kind and helpful to those around them while contributing to meaningful change. He emphasizes that a change maker operates with love and kindness in mind, rather than the intention of simply being successful. Abraham was reminded by one of his mentors that settler society insists that we are never enough, with our identities being defined by our accomplishments. Abraham, however, resists this way of thinking and instead wants to remind Indigenous and non-Indigenous individuals that it is important to be kind and patient not only to those around you, but also to yourself.

What change will you make through love and kindness?

OVERVIEW: OPTION #1 – WATER TESTING AND REPORT

In this Case Study and Learning Activity students learn about the characteristics of a Change Maker through exploring the actions of Abraham Francis, a member of the Kanienkehaka (Mohawk) community of Akwesasne, who is advocating for his people and the rights of rivers. After learning about Abraham's many actions as a Change Maker, students learn how to bring awareness to an ecosystem by writing a letter *to* it.

OBJECTIVES

- Understand that there are many ways for a person to contribute to meaningful change in their community.
- Demonstrate an understanding of the significance of all natural ecosystems by writing a letter.

MATERIALS

- Pen/Pencils OR computers
- Projector

TIME

3-4 hours (class periods)

LESSON PLAN

1. Read

A) Ask students to read the Great River Rapport's Change Maker Series' *Abraham Francis: A Voice for the River* individually.

or

B) Read the Great River Rapport's Change Maker Series' *Abraham Francis: A Voice for the River* to students, making note of bolded terms and their definitions.

2. Class discussion prompts

A) What makes Abraham a Change Maker?

B) In the conclusion of the story, Abraham emphasizes that a change maker operates with love and kindness in mind, rather than the intention of simply being successful. Do you think that the intention behind actions makes them less meaningful?

C) What ecosystems in your community do you think should have its own rights to flourish and thrive?

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3. Watch

A) Rights of Nature: A Timeless Concept Whose Time is Now – Presentation by Abraham Francis & Lee Willbanks

Rights of Nature: A Timeless Concept Whose Time is Now- 17 minutes YouTube

https://www.youtube.com/live/E3ewiJM3EF4?t=6980&si=OlHGyz17NXB-KEL1

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4. Be the Change Maker

A) Explain to students that it is their turn to be the Change Maker. Task students with choosing an ecosystem that they connect with, followed by writing a letter to this ecosystem to reflect on how they connect to it, to bring awareness to it and make a call to action for its protection.

> **Tip:**
> Bring students outside to choose an ecosystem that they connect with. Chosen ecosystems can vary from being a meadow, to a water body or even an urban outdoor landscape.

B) Once the students have chosen their ecosystem and have spent time in it, ask students to research information about their chosen ecosystem.

> **Tip:**
> See letter criteria on next page.

C) Write a letter to the ecosystem

5. Assignment

Bring awareness to an ecosystem by writing a letter to it!

Letter Criteria

- A short positionality statement:
    - Greeting
    - Who are you?
    - Where do you come from?
    - What is your relationship to this place?
    - Why do you care about this place?

- Information about why this ecosystem is important:
    - **Ecologically** (i.e. what lives there and what ecosystem services does it provide?)
    - **Socially** (I.e. is this a place of recreation for people, is it a place that connects people to nature?)
    - **Culturally** (i.e. What Indigenous Nation's land is this ecosystem on? Do you know how it is important to their culture?)

- What can be done to protect this ecosystem?
- A call to action for protecting this ecosystem.
- A salutation to the ecosystem.

TIP: Post the criteria for the letter to the board for students to easily refer to

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Extensions and modifications

- If there is a lack of access to different ecosystems at or nearby your school, challenge students to research and identify an ecosystem of interest to them!
- Provide the option for students to meet criteria by making a video, slideshow or tiktok.
- Have students share their letters widely and make an impact for their chosen ecosystem by posting their letters to social media
- Engage students with the letters written by their peers by having students read their letters to the class
- Are there any Rights of Nature movements in your area? Challenge students to find out and see if you can get involved!
- Take an extra step to engage audiences with letters by having students create art that represents their chosen ecosystem, just like Talking Rivers did!

TIP: Have students respond to discussion prompts as an exit ticket or in journals.

Vocabulary

- Kanien'kehá:ka
- Empowerment
- Haudenosaunee
- Settler-colonial
- Mentor
- Ecosystem
- Interconnectedness
- Industrial pollution
- Spawning grounds
- Migration
- Accountable
- Call to action
- Exploited

RUBRIC

	Level 1	**Level 2**	**Level 3**	**Level 4**
Depth of thought and connection	Letter demonstrates a limited connection to and consideration of the ecosystem	Letter somewhat demonstrates a connection to and consideration of the ecosystem	Letter demonstrates a connection to and consideration of the ecosystem	Letter emphasizes a deep connection to and thoughtful consideration of the ecosystem
Research and call to action	Letter demonstrates limited research about the ecosystem and a limited or lack of a call to action for its protection	Letter demonstrates sufficient research about the ecosystem and a call to action for its protection	Letter demonstrates good quality research about the ecosystem and a relevant call to action for its protection	Letter clearly demonstrates thorough research about the ecosystem and a realistic and meaningful call to action for its protection
Writing quality	Letter demonstrates limited written quality, with many grammatical errors and sentence structure errors	Letter is sufficiently written, with some grammatical errors and some sentence structure errors	Letter is well written, with very few grammatical errors, good sentence structure and use of impactful terms	Letter is very well written, with no grammatical errors, excellent sentence structure and use of impactful terms
Overall Quality	Letter demonstrates limited overall quality and meets limited criteria	Letter demonstrates sufficient overall quality and meets most criteria	Letter demonstrates good overall quality and meets all criteria	Letter demonstrates excellent overall quality and goes above and beyond all criteria

Chapter 5: Conclusion

This portfolio reflects influences from my MEd studies, experiences had during my Undergraduate degree, and my work at a non-profit environmental organization, the River Institute. With Undergraduate studies focused on the environment and education, in an effort to contribute to meaningful change in my community for the betterment of the environment, and with an opportunity to create education materials through the Great River Rapport project, I came to develop the Great River Rapport's Change Maker Series. Upon completion of the two resource bundles for this portfolio, I understand how my engagement with Land-based environmental education, decolonial and activist pedagogy has been influential. It is also important to note the significant influence that each change maker, Stephany Hildebrand and Abraham Francis, had on the design and development of their respective resource bundles. A unique aspect of designing these resource bundles is that the direction of stories and learning activities always veered from my original ideas. Sometimes, I would suggest that we take an alternative approach, and other times, the change makers would suggest alternative approaches to me. Adapting these resource bundles to accurately and appropriately represent each change maker came from building relationships and understanding each individual and their life experiences as well as being open to collaboration. This adaptive process also embodies the essence of the lived curriculum discussed by Aoki (1993) because of carefully considering the lived experiences of each change maker. Adapting these resource bundles was a rewarding experience that led to exciting new ideas and demonstrates the importance of collaboration for the design of rich education resources.

The two resource bundles, *Stephany Hildebrand: Framing the Environment* and *Abraham Francis: A Voice for the River* employ the Indigenous philosophies of Land as first teacher, through the act of learners spending time immersed in nature (including urban outdoor spaces) (Styres, 2011). Immersing learners outdoors allows nature to be first-teacher and is a way to encourage learners to

understand their relationships with the Land (Styres, 2011). Decolonial pedagogy is also employed through these resource bundles, especially that of Abraham Francis, as it aims to center and validate the worldviews, rights, knowledge and language of Indigenous Peoples (Korteweg & Russell, 2012). With the goal of the Change Maker Series being to empower future change makers, activist pedagogy was an important influence in the development of these resource bundles. A key aspect of activist pedagogy, as highlighted by Niblett (2017), is that it entails guided activities that support learners in understanding their ability to contribute to real change. It is my hope that guiding learners to put their ideas into action through the learning activities in the Change Maker Series will allow learners to gain increased self-efficacy to realize just how capable they really are of making change (Niblett, 2017). The completion of this MEd portfolio has convinced me of the opportunity that project-based learning activities with the influence of Land-based education, decolonial pedagogy, and activist pedagogy present as an instructional approach to engage learners and influence real change. This portfolio demonstrates that a combination of Land-based environmental education approaches as well as activist and decolonial pedagogies, in combination with project-based learning, is a promising approach to resource bundle design that can empower learners to be future change makers.

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