

Environmental Education at Kwantlen Polytechnic University:
Hidden Curriculum, Informal Learning of Pro-environmental Values

by

MELISSA DRURY

A Thesis Submitted to the Faculty of Social and Applied Sciences in Partial Fulfillment of the
Requirements for the Degree of

MASTER OF ARTS IN ENVIRONMENTAL EDUCATION AND COMMUNICATION

Royal Roads University
Victoria, British Columbia, Canada

Supervisor: Dr. Geo Takach
June, 2024

© MELISSA DRURY, 2024

COMMITTEE APPROVAL

The members of Melissa Drury's Thesis Committee certify that they have read the thesis titled Environmental Education at Kwantlen Polytechnic University: Hidden Curriculum, Informal Learning of Pro-environmental Values and recommend that it be accepted as fulfilling the thesis requirements for the Degree of Master of Arts in Environmental Education and Communication:

DR. GEO TAKACH [signature on file]

DR. JOEL MURRAY [signature on file]

Final approval and acceptance of this thesis is contingent upon submission of the final copy of the thesis to Royal Roads University. The thesis supervisor confirms to have read this thesis and recommends that it be accepted as fulfilling the thesis requirements:

DR. GEO TAKACH [signature on file]

Abstract

The purpose of this study was to identify if and how the hidden curriculum (informal teaching and learning) on Kwantlen Polytechnic University (KPU) campuses influences students' pro-environmental behaviour and ideas. The study aims to make the invisible visible. A phenomenographic approach involved interviewing 14 KPU students, individually, to collect their perceptions of pro-environmental examples on campus, and potential improvements. I grouped data from interviews into themes and also incorporated the lens of environmental worldviews into my analysis of the results. Consequent recommendations to KPU and post-secondary counterparts include environmental communications incorporating understanding of different worldviews, efforts to move towards zero-waste (making green behaviour convenient) as well as fostering stronger community and student sense of belonging. It is hoped the KPU community, as well as other post-secondary institutions, can better model environmentally responsible practices on all campuses to positively influence environmental literacy and pro-environmental values of students.

Keywords: hidden curriculum, education, informal learning, pro-environmental behaviour, worldviews, environmental sustainability

Table of Contents

Abstract	3
Table of Contents	4
Acknowledgements	6
Introduction	7
Research Objectives	12
Research Question	12
Literature Review	12
Informal Education and/or Hidden Curriculum	14
Phenomenography	16
Environmental Worldviews applied to Environmental Education	18
Research Methodology	24
Research Design	24
Project Participants	27
Instrumentation/Data Collection	29
Data Analysis	30
Limitations, Validity & Reliability	31
Limitations	31
Reliability & Validity	33
Biases	33
Ethics	34
Findings	35
Pro-environmental, or environmentally sustainable examples and events seen on campus	37
Informal education teaching pro-environmental values	41
Challenges identified with pro-environmental activities on KPU campuses	42
How to enhance informal environmental education at KPU	44
Discussion	47
Pro-environmental, or environmentally sustainable examples and events seen on campus	53
Solid Waste	54
Transportation	57
Events	59
Food	60

Green Space.	61
Informal education teaching pro-environmental values	62
Challenges identified with pro-environmental activities on KPU campuses.....	64
How to enhance informal environmental education at KPU... AKA recommendations	71
Micro.	73
Meso.....	79
Macro.	83
Conclusion	85
Key Findings.....	85
Research question(s) and address research aims	86
Contribution to the state of knowledge and understanding about informal environmental education.....	86
Dissemination to KPU Community	89
Limitations of this study	90
Suggested avenues for further research	91
Closing remarks	91
References.....	93
Appendices.....	105
Appendix 1 – Request for Volunteers.....	105
Appendix 2 – Questions for Participants	106

Acknowledgements

I am deeply indebted to my thesis supervisor, Dr. Geo Takach, for his patience, guidance, and valuable feedback in this process. You have taught me so much in this lengthy process and I truly appreciate your support and encouragement.

I also thank my second committee member, Dr. Joel Murray, for his assistance, patience, knowledge, and eagle eyes with respect to grammar and more in this project.

I am grateful to Dr. Robert Kull for his assistance in helping me muddle through determining my thesis topic.

I am extremely grateful to Dr. Hilary Leighton for her guidance (and patience with me) as the Head of the MAEEC program.

This endeavor would not have been possible without the 14 KPU students, and recent alumni, who volunteered their valuable time and thoughtfulness to this research. I enjoyed learning from, and working with, all of them.

I am grateful to my family; Travis, Jillian, Dylan, Auntie Nancy, Auntie Lorraine, and many others, for their love, support, and encouragement during this lengthy learning journey.

I am grateful to the Indigenous peoples of the land where I live, as an uninvited settler, for their stewardship of this beautiful place on earth since time immemorial. Specifically, I thank Coast Salish, Stó:lō, Katzie, Tswassen, Kwantlen, and Semiahmoo peoples.

Introduction

Pro-environmental values in humans are essential for the health of our Earth, and post-secondary institutions have the opportunity to positively influence youth and communities in this realm. Winter & Cotton (2012) note that, in addition to formal academic curriculum, opportunities exist on university campuses for facilitating learning about environmental sustainability, and that they are safe places where experiential, place-based learning about environmental sustainability can be fostered. This research explores informal ways in which post-secondary institutions can contribute to environmental education (EE).

Formal education, or curriculum, “following the ‘Western model,’ consists of systematic instruction in ‘universal’ knowledge and skills, provided at prearranged times and places by specialists” (Trommsdorff, 2001). At KPU formal curriculum consist of learning outcomes within courses (course learning outcomes; CLOs) and programs (program learning outcomes; PLOs). Incorporating sustainability into formal curriculum at post-secondary institutions requires significant time and resources of faculty. In addition to this, not all faculty are inclined to add environmental-sustainability issues to their teaching materials. Incorporating environmental sustainability into *informal* education is a possible way to help educate students regardless of which program they are in, or what the priorities and values of their instructors are. Hidden curriculum, also known as informal education, is one way in which an institution can shape ideas and behaviours of the community. Hidden curriculum is “the idea that the structures of schooling teach much that is not included in the official curriculum” (Schubert, 2018 p. 404).

According to the Glossary of Education Reform (2015),

hidden curriculum refers to the unwritten, unofficial, and often unintended lessons, values, and perspectives that students learn in school... the hidden curriculum consists of the unspoken or implicit academic, social, and cultural messages that are communicated to students while they are in school. (para. 1)

Intentional hidden curriculum can be thought of as an educational institution leading by example. People may be influenced by the culture of their surroundings (Schubert, 2018 p. 404), such as the quality of the solid waste collection/management systems, the availability of intercampus shuttles and EV charging stations, the offering of sustainable menu items at cafeterias, the availability of showers for those who use active transportation, and the importance placed on providing and maintaining natural outdoor spaces on campus. Solid waste collection systems with clear instructions can, for example, inform people why it is important to compost organic material; the greenhouse gas impacts of methane, which results from anaerobic decomposition of organic matter, are not yet common knowledge. Making EV charging stations available supports people who drive electric vehicles, and allocating resources to installing them can express to the community that KPU acknowledges the importance of decarbonizing transportation and mobility. Offering locally grown and produced meat free menu items allows people to make more sustainable food choices when they purchase meals at campus food services. Failing to provide these relatively simple things (organics collection, EV charging places, and sustainable meal options) to help facilitate sustainable behaviour is unintentional hidden curriculum. An institution can be unintentionally teaching the community that these pro-environmental actions are unimportant. The values and norms communicated or fostered by

hidden curriculum can become part of the culture, or one's view of the world, of the place and community within it. Worldviews will be discussed in more detail below.

In response to the challenges of widely incorporating sustainability into formal curriculum, such as bureaucracy and limited resources, “[environmental] enthusiasts have increasingly turned to other spaces where students share access and experiences, the most prominent of which is the university campus” (Winter & Cotton, 2012, p. 785). The idea that the institution can lead by example and encourage pro-environmental values through informal education resonates with me because it seems logical and simple; demonstrate pro-environmental behavior to inspire others to do it too. In *Learning Spaces*, Oblinger states that at colleges and universities formal learning occurs in classrooms, and informal learning results from “serendipitous interactions among individuals” (2006, p. 1.1): “Space ... can have an impact on learning. It can bring people together; it can encourage exploration, collaboration, and discussion” (Oblinger, 2006, p. 1.1). In line with this, I want to explore if, how, and to what extent the learning spaces in a post-secondary institution can convey and encourage pro-environmental values in students.

Kwantlen Polytechnic University (KPU) has been offering post-secondary education for more than 30 years and offers a range of degree, diploma, certificate, and citation programs on five different campuses in the lower mainland of BC. I have worked at KPU as an instructor for over 10 years, and in various support staff roles for the 10 years before that. A key goal in KPU's Draft VISION 2023 is to “foster environmental sustainability through our offerings, research and operations” (KPU, 2018). This research will explore, through interviewing students and recent graduates, if and how KPU incorporates environmental sustainability into informal and non-

curricular education on campus. Information collected by qualitative research and presented in a report can foster conversations about environmental education and can begin to account for what is being done outside of formal curriculum at KPU to encourage pro-environmental behaviour.

Oxford Reference (2024) defines worldview as “a largely unconscious but generally coherent set of presuppositions and beliefs that every person has which shape how we make sense of the world and everything in it.” Worldviews are diverse at KPU; all campuses are situated in the multicultural communities of Richmond, Surrey, and Langley, BC. In the 2017/18 academic year, 29% of KPU students were international students, primarily from India (KPU, n.d.). Input from diverse worldviews can add value to the insights on the importance and effectiveness of informal environmental education on campuses.

I asked student participants how they define environmental sustainability, what they recalled seeing on campus as examples of informal environmental education, and asked how informal environmental education could be improved in their eyes. I sought to explore, in the eyes of students, the important environmental issues and the effective ways that KPU can informally teach these values, or lead by example. Questions for participants are included in Appendix 2.

The responses of students for this research may provide insight on how and if KPU is demonstrating pro-environmental values in its operations. In addition to checking to see if it is teaching green values/sustainability in leading by example, what messages are perceived by students with respect to sustainability? How can KPU operate and become more environmentally proactive, thus demonstrating a positive example to our communities?

I remain curious about the importance and potential impact of hidden curriculum. Is KPU using the power of intentionally designed hidden curricula to their advantage? I have joined KPU's Environmental Sustainability Committee in an effort to better understand KPU's environmental sustainability goals. The committee's mandate is "to facilitate, advise, advocate and enable the implementation of integrated environmental sustainability activities at KPU" (KPU, 2018). The President and Vice Chancellor of KPU and the Executive Director, Facilities Services are the co-chairs of the KPU Environmental Sustainability Committee. My volunteer involvement with this committee has increased my familiarity with sustainability goals at KPU.

Once completed, I plan to present my research results to the committee as an interested and influential audience. I have been invited to join KPU's Sustainability Hub, run by the Office of Sustainability, so I can share it there, as well as with KPU's Natural Spaces Advisory Committee (NSAC). KPU's Sustainability Hub is "a space where members of the campus community, including faculty, staff, and students, come together to collectively advance sustainable performance at KPU through dialogue, advocacy, and action" (C. Joseph, personal communication, email October 25, 2023). NSAC is a committee which was created in order to recognize that many outdoor natural spaces on campus are also 'classrooms'; they are used by instructors for teaching and learning activities. NSAC includes both faculty representatives, as well as representatives from Administration, specifically Facilities, who care for KPU grounds and buildings.

This research may support and build upon the work of the KPU Sustainability Committee, as well as KPU's Sustainability Hub. Student perspectives will provide insight on

how current efforts impact the KPU community and may provide inspiration for activities and events encouraging environmental sustainability.

Research Objectives

My objective was to look into whether environmental education was happening informally at KPU. For the purposes of this study, I did not provide a definition of environmental education/sustainability to the interviewees because I do not want to influence or limit participant perceptions.

Research Question

The purpose of this study is to explore the informal environmental learning of students at a post-secondary institution, KPU. At this stage in the research, informal environmental education will be generally defined as an institution leading by example and influencing students through their engagement with environmental sustainability initiatives. Informal education, and what it means, is discussed further in the literature review below.

How do post-secondary students perceive pro-environmental, or environmentally sustainable, examples on campus? In the eyes of students, how can informal education teach pro-environmental values? In their imaginations, what can be improved?

This is what I want to explore: to what extent, and how, is environmentally sustainable management on campus influencing or teaching students? In the eyes of students, how can campus management be applied as an informative means to support learning about environmental issues and sustainability?

Literature Review

During this research I reviewed journal articles, books, and websites on informal education and/or hidden curriculum, teaching environmental sustainability, phenomenography, and environmental worldviews. Informal environmental education resonates with me as a means for large institutions to lead by example. In my eyes, educational institutions have a responsibility to make positive social change. Phenomenography is a method I have applied because I wanted to explore this concept from the perspective of KPU's key stakeholders: students. I believe worldviews encompass so much of how individuals value and/or treat the world around us. Applying the lens of worldviews to this research helps tie in the concept of environmental education and communications to it. Exploring variety within worldviews can help with navigating pre-conceived values and ideas about our climate challenge, as well as how to communicate with folks with various worldviews and opinions on climate change. In colonial terms, worldviews are also relevant to the informal aspect of education. What colonial or western views consider informal education, such as storytelling, may not be deemed 'informal' in Indigenous, or kinship, worldviews. In *Restoring the Kinship Worldview* Darcia Narvaez explains that in Indigenous worldview education "the learner is not separated from community to learn abstractions but learns within the community the personal knowledge needed for practical wisdom, the coordination and integration of all... areas" (Topa (Four Arrows) & Narvaez, 2022, p. 339).

In *Braiding Sweetgrass* (2013, p. 9), Robin Wall Kimmerer explains that in Western worldviews, humans are at the top of a hierarchy of living beings, with plants at the bottom, but in Native ways of knowing, Wall Kimmerer describes that humans are viewed as having the least experience (as compared to plants) on this land, and therefore have much to learn. She

emphasizes that humans should look for teachers among other species for the wisdom of the ways in which they live, because they have lived here on earth for longer than we have. This lens of Indigenous worldviews emphasizes the importance of human beings being part of nature, in contrast to being apart from it. Because of this we need to re-learn to live within nature, in reciprocity with it; continued attempts to dominate our natural world are unsustainable and will likely result in our own demise.

Informal Education and/or Hidden Curriculum

People learn from their surroundings and education happens in a variety of ways. Hopkinson, Hughes, and Layer (2008) outline three types of curriculum: “(1) Formal curriculum (2) Informal curriculum (3) Campus curriculum” (p. 437) and note that each can contribute to the environmental-sustainability education of post-secondary students. My research and curiosity involve informal curriculum (learning activities outside of formal curriculum such as events and volunteering) as well as campus curriculum (“the way in which campus environmental management and sustainability can be used as an educational tool in support of learning about [sustainable development]” (p. 436)). In this work I merge the concepts of both informal curriculum and campus curriculum in the terms *informal education* or *hidden curriculum*.

I wanted to explore how the operations, events, and activities on a campus can support environmental education. Campus facilities and operations departments are motivated by cost savings to decarbonize energy use and reduce water consumption on campus. Can communicating these initiatives, and other pro-environmental behaviour, help educate students

on environmental issues? Hopkinson, Hughes, & Layer (2008) shine light on the importance of informal environmental education in the statement:

Much has been written about the environmental management of campus operations such as energy, transport, etc., but much less attention has been given to the way in which campus environmental management and sustainability can be used as an educational tool in support of learning about [sustainable development]. (p. 436)

Several studies (Barth, Godemann, Rieckmann, & Stoltenberg, 2007; Chiong et al., 2017; Winter, & Cotton, 2012) identify how the hidden curriculum of the campus (informal teaching and learning on and around campus, teaching not formally delivered in classrooms or labs) influences students' conceptions of sustainability. For example, sustainable campus operations, events hosted by environmental clubs, and extracurricular activities can all contribute to teaching students about environmental sustainability.

Chiong et al. (2017) note that "graduates are influenced by the environment they are in and that explains why factors such as campus management have influence on sustainability integration into [institutions of higher education]" (p. 919). This illustrates the importance of non-curricular opportunities for education for sustainable development teaching and learning, and to engage in conversations about teaching sustainability values on campus.

Post-secondary education institutions have the opportunity to strengthen and enhance informal learning and education of their students. Barth et al. (2007) "refer to universities as learning environments that also offer settings for informal learning, such as discussions with fellow students or volunteering in student groups on campus where students learn outside the

organised academic learning processes” (p. 420). I hope to explore how KPU can contribute to the environmental education of their students by applying informal education and/or hidden curriculum; how can learning activities outside of course curriculum, and campus environmental management and sustainability, encourage pro-environmental behavior?

According to Al-Nuaimi and Al-Ghamdi (2022) higher education institutions (HEIs) are increasingly aware that they need to support sustainability and sustainable development, and this contribution can be made when educating post-secondary students. “HEIs can promote a sustainable society through their education, culture, and campus, as well as provide capable professionals for business, communities, and the economy” (Al-Nuaimi, 2022, para 3, introduction).

This research may ignite conversations and therefore learning about sustainability and pro-environmental behaviour among the participants and their friends and family. “Encouraging students to critically analyse and evaluate the messages being sent by an institution can potentially raise awareness of sustainability practices and encourage dialogue about personal responsibility” (Winter & Cotton, 2012, p. 792). The conversations student participants have with friends and family about participating in this research can encourage a more thorough consideration of what demonstrates green values on KPU campuses, and elsewhere.

Phenomenography

Phenomenography is a method of research used to describe the appearance of a phenomenon. This study aims to explore if and how environmental education is being informally taught at KPU, and phenomenography allows the collection of student perceptions of this phenomenon. As Orgill (2012) observes:

Phenomenography is an empirical research tradition ... designed to answer questions about teaching and learning, particularly in the context of educational research. The aim of a phenomenographic study is to identify the different ways in which a group of people experience, interpret, understand, perceive or conceptualize a certain phenomenon or aspect of reality — and to do so from the perspectives of the members of the group. (p. 2608).

Winter and Cotton's (2012) article, "Making the Hidden Curriculum Visible: Sustainability Literacy in Higher Education" sparked my curiosity in exploring KPU student ideas about informal environmental education. Their research used a "phenomenographic approach to explore students' perceptions of the 'hidden sustainability curriculum' at a leading sustainability university" (p. 783). They applied the approach in order to "identify and categorise the qualitatively different experiences of students regarding campus based sustainability" (p. 787). Findings in Winter & Cotton (2012, abstract) suggest that facilitating student examination of environmental hidden curriculum may strengthen their sustainability literacy, and that it can help develop their understanding of sustainability as well as their ability to imagine and craft solutions. This can potentially evolve into stronger pro-environmental behavior. My research did not delve as deep into this as Winter & Cotton did; however, their work, in addition to mine, may inspire future research at KPU on this subject.

By inviting students from multiple campuses of KPU to participate in this research I hoped to gain insights from students on the phenomenon of informal environmental education on a post-secondary education campus.

Environmental Worldviews applied to Environmental Education

I employ environmental worldviews as a theoretical lens to analyze, understand, and discuss the results of this research because “worldviews profoundly inform how environmental issues, such as climate change, are perceived” (de Witt, 2015, p. 908) and “public divisions over climate change do not stem from the public’s incomprehension of science but from a distinctive conflict of interest that can be best explained by fundamental differences in worldview” (de Witt, 2015, p. 907). As mentioned earlier, Oxford Reference (2024) defines worldview as “a largely unconscious but generally coherent set of presuppositions and beliefs that every person has which shape how we make sense of the world and everything in it”. Peoples’ worldviews influence how they interpret environmental issues and where they place human activity in relationship with Earth. Some understanding of varying worldviews can assist with the efficacy of environmental communication, as well as informal environmental education.

I now touch on both Indigenous and non-Indigenous worldviews here, with respect to how they relate to environmentalism. The definition of environmental worldviews applied in this research is based on how de Witt (2015) outlines non-Indigenous worldviews (the four categories of traditional, modern, postmodern, and integrative), as well as the Indigenous worldview as defined by Wilson and Hodgson in *Pulling Together: Foundations Guide*: “In the Indigenous worldview, everything has a spirit and deserves to be respected. The natural world was not simply a resource to control or conquer” (Wilson & Hodgson, n.d., Section 2: Colonization, para 13).

In non-Indigenous *Traditional worldviews*, people are “fundamentally different from nature ... [and] [t]he relationship with nature is frequently understood in terms of “dominion” or

“stewardship”” (de Witt, 2015, p. 910). The anthropocentrism of dominion degrades our environment for human use and convenience, while the concept of stewardship directs humans to care for land and the environment.

In non-Indigenous *Modern worldviews* “the existence of a higher power... is generally rejected. Science tends to be seen as the ultimate ... source of reliable knowledge Individualistic and hedonistic values—such as freedom, independence, success, performance, social recognition, comfort, and fun—are usually dominant” (de Witt, 2015, p. 910). Unfortunately, success, social recognition, comfort and convenience tend to present as consumerism in people, which of course uses natural resources and creates significant waste, which are both deleterious to our environment and contribute significantly to climate crisis.

Non-Indigenous *Postmodern worldviews* are “characterized by a tendency to acknowledge and value multiple perspectives on reality, and are generally critical of science’s claim to exclusively provide objective knowledge” (de Witt, 2015, p. 910). *Postmodern Worldviews* “emphasize the relativity and contextuality of knowledge, as well as the value of moral, emotional, and artistic ways of knowing” (de Witt, 2015, p. 910). “Generally, postmodern worldviews celebrate diversity, heterogeneity, relativism, and “postmaterialistic” ... values” (de Witt, 2015, p. 910). Ideally, postmaterialistic values can and will lead to the consumption of fewer resources and less wastefulness.

Non-Indigenous *Integrative worldviews* are “primarily characterized by a self-reflexive attempt to bring together and synthesize elements of other worldviews, or of domains that in other worldviews tend to be viewed as mutually exclusive” (de Witt, 2015, p. 910). In Hedlund-de Witt’s (2014) research, which interviews twenty integrative environmental leaders, they

explain that the “integrative cultural movement and worldview, which attempts to reconcile rational thought and science with a spiritual sense of awe for the cosmos... may hold important potentials for sustainable development” and that Integrative worldviews “may serve the important task of public communication and large-scale mobilization for sustainable solutions to our pressing, planetary issues” (p. 191). Integrative worldviews may lead to stronger human connections with nature, and the view of nature having intrinsic value — a suitable segue to Indigenous worldviews.

I aim to include the lens of *Indigenous worldviews*, where Earth is not to be conquered, but where humans live in relationship with Earth, as a respectful and grateful part of ecosystems, in an attempt to assist to decolonize a small piece of informal education at KPU. “In the Indigenous worldview, everything has a spirit and deserves to be respected. The natural world was not simply a resource to control or conquer.” (Wilson & Hodgson, n.d., Section 2: Colonization, The Indigenous worldview).

Environmental aspects of Indigenous worldviews are shared by many in the book *We are Kwantlen*. Kwantlen’s Chief Marilyn Gabriel states “everything we are as a people is connected to the land. Even our language comes from the land. Without ... connection or belonging to our sacred land – we’d be lost” (p. 20). This is valuable insight for people who do not naturally feel connection to the land; Indigenous worldviews connect humans to the environment intrinsically. In *We are Kwantlen* Sesselot Fern Gabriel shares that “the river is our grandmother. We treat her with respect” (p. 18). Fern refers to the Fraser River as a close relative, as part of their immediate family. Fern tells readers that “Kwantlen valued the strength that came through living traditions of respect with a good mind and a good heart” (p.18). In this perspective, living in

harmony with the land and treating the natural environment as a close relative provides people with strength and essential resources for life. Sacquilty Charlie Savino shares that Kwantlen people “thank the river for the fish we get” and that “The river is us. We are part of the river” (p. 19), again painting us a picture of the reciprocity of the Kwantlen Indigenous worldview.

I am including Indigenous worldviews in this work because for the most part we, as humans, seem to have lost our connection with the earth and our understanding that we are part of nature, not apart from it. In their 1967 article, *The Historical Roots of Our Ecological Crisis*, Lynn White, Jr. explains how, in Medieval times, a shift in agricultural technology made progress so that the “relation to the soil [and so, our environment] was profoundly changed. Formerly man had been part of nature; now he was the exploiter of nature” (p. 1205). This helps to explain the traditional worldview in which humans are not only separate from nature, but also master of it.

According to White (1967) “human ecology is deeply conditioned by beliefs about our nature and destiny — that is, by religion” (p. 1205), and

Man named all the animals, thus establishing his dominance over them. God planned all of this explicitly for man's benefit and rule: *no item in the physical creation had any purpose save to serve man's purposes....* Especially in its Western form, Christianity is the most anthropocentric religion the world has seen. (p. 1205)

According to White, (1967) Christianity, unlike paganism and the religions of Asia, separated humans from nature and demanded that it is God's will for humans to exploit nature for their use. This is clearly not a positive contributor to a worldview which includes stewardship of

our planet Earth. Of course, sweeping generalizations tend to be inaccurate and are unfair. There are Christians in our world, such as Canadian climate scientist Katharine Hayhoe, who choose to interpret the responsibility for every living thing on earth, as written in the Bible, as wise stewardship of nature, instead of as dominion over the earth. When discussing how climate change will “strike hardest against the very people [Christians are] told to love: the poor and vulnerable” (Hayhoe, 2019), Katharine Hayhoe (2019) explains to her critics that “caring about this planet and every living thing on it is not somehow antithetical to who we are as Christians, but rather central to it. Being concerned about climate change is a genuine expression of our faith.”

In response to the idea that “many observers claim there has been a “greening of Christianity” in the United States.” (Clements et al, 2014) the 2014 study by Clements et al “suggest[s] that [a] presumed greening of Christianity has not yet translated into a significant greening of pro-environmental attitudes, beliefs, and behaviors of rank-and-file Christians in the U.S. general public.” Another study, in 2022, by Ives et al. found that pro-environmental messaging from trusted faith-based sources can impact and encourage pro-environmental behavior. Ives et al. conclude there is

Evidence of internal shifts in beliefs and attitudes in response to pro-environmental messages framed through the lens of Christian theology, and the activation of these beliefs in self-reported behavioural changes offers substantial promise that faith communities can play an important role in the societal transformation needed for an ecologically sustainable twenty-first century. (p. 888)

While White (1967) states that Christianity separated humans from nature, and demanded that it is God's will for humans to exploit nature for their use, in contrast, Indigenous worldviews posit humans are an integral part of our environment. We must live respectfully in this world, learning from our elders, which, according to Robin Wall Kimmerer (p. 18, 28, 56, 2013), are plants and other species which have been on Earth longer than humans have.

Decolonization and inclusion of Indigenous voices are essential in teaching and learning in BC, and all of Canada. From my experience as a parent of a child currently in grade 9 in BC, I am aware that the K-12 system is making steps toward including Indigenous voices in curriculum. Post secondary institutions also need to do this important work. *xéʔełł KPU Pathway to Systemic Transformation* has been written with support from the Indigenous Advisory Committee at Kwantlen Polytechnic University. *xéʔełł* commits KPU to an ongoing process of systemic transformation through actions detailed in six pathways, one of which is *Weaving Indigenous Worldviews: Foster sense of belonging, personal growth, well-being, and empowerment* (<https://www.kpu.ca/indigenous/activities>). Two items within this pathway are relevant to informal environmental education and applying Indigenous worldviews to assist with it: “Create physical and virtual spaces at each of the five campuses that reflect Indigenous peoples’ histories, contributions, languages and diversities” (*xéʔełł KPU Pathway to Systemic Transformation*, p. 17), and “Host welcoming events and community circles to support students’ sense of belonging to connect with their peers in classroom settings” (*xéʔełł KPU Pathway to Systemic Transformation*, p. 17). These connections will be explained further in the Discussion section.

In this section I have written about the literature read and reflected upon in this thesis work. Following is a description of the research methodology for my work.

Research Methodology

Research Design

Phenomenography is an exploratory and qualitative method of research which originates in educational research (Hajar, 2020) and is used to describe the appearance of a phenomenon.

Phenomenography “originally emerged ... when Marton and Säljö (1976) conducted a landmark study at the University of Gothenburg in Sweden with a group of first-year university learners to understand why learners faced with the same learning problem or opportunity often arrived at different outcomes or solutions (Hajar, p.1, 2020).

It “investigates the qualitatively different ways in which people experience something or think about something” (Bowden et al., 1997; Ashworth & Lucas, 1998, as cited in Farrow et al 2020) and “the main purpose of phenomenographic research is to discern different ways of understanding a given phenomenon” (Hajar, 2020). Hajar states that “the phenomenographer should have specific criteria when choosing their participants, in order to obtain the most varied and similar data” (2020, p. 6) and that 15-20 participants is ideal in order to “allow variations in experience and perceptions to be revealed without producing an unwieldy volume of data to analyse” (2020, p. 6).

Advantages of phenomenography as a research tool [are]:

- it provides direct descriptions of the phenomenon of interest;
- it describes individuals’ conceptions in a holistic and integrated way;

- it can capture a range of conceptions, due to its focus on both similarity and variation in individuals' experiences; and
- it produces descriptions of conceptions which are useful in teaching and learning (Hajar, p. 10, 2020).

Orgill (2012), as cited in (Hajar, 2020) believes the major problem of phenomenography is that “contradictions are possible between a phenomenographer’s interpretation of their participants’ accounts of a particular phenomenon and the participants’ actual experiences of that phenomenon”.

Phenomenography allows a small number of KPU students, key members of our campus community, to express their impressions of pro-environmental activities on campus and to contribute their ideas and imaginations to this research. This study aims to explore if and how environmental education is being informally taught at KPU, and phenomenography allows the collection of student perceptions of this phenomenon. As Orgill (2012) explains:

Phenomenography is... designed to answer questions about teaching and learning, particularly in the context of educational research. The aim of a phenomenographic study is to identify the different ways in which a group of people experience, interpret, understand, perceive or conceptualize a certain phenomenon or aspect of reality. (p. 2608.)

Because of this, I have used a phenomenographic approach in this study.

“Phenomenography applied to adult education focuses on exploring and portraying how learners experience and interpret learning” (Patton, 2002, p. 483) and my research is interested in exactly

this: exploring whether, and if so, how non-curricular activities can teach environmental sustainability.

Asking different students for their insights on an experience, informal environmental education for example, can provide insight into the variety of interpretations and understandings of activities. An advantage of the phenomenographic research method is that “different students can understand ... one and the same concept in a number of different ways” (Booth, 1997, p. 136).

The questions I asked student participants were open-ended interview questions: What pro-environmental, or environmentally sustainable, examples have you seen on campus? In your eyes, is this informal education a way of teaching pro-environmental values? In your imagination, what can be improved? Their interview responses did “yield direct quotations ... about their experiences, opinions, feelings, and knowledge” (Patton, 2002, p. 4). I chose the format of a small number of open-ended interview questions partly because Patton (2002) explains that “open-ended responses permit one to understand the world as seen by the respondents” (p. 21) and this is a key aspect of phenomenography. The method of phenomenography is in line with the aim of this research; responses to open-ended questions from a participant will most closely represent the lived experiences and perceptions of the participant. I do not want my own ideas and biases of what environmental sustainability is happening (or not happening) on campus to influence this research and so “gathering responses to open-ended questions [enables me] to understand and capture the points of view of other people without predetermining those points of view” (Patton, 2002, p. 21). Open-ended questions help to facilitate conversation by leading to more conversation about the topics being discussed.

Questions used in this research, listed in Appendix 2, were created with the hopes of fostering the sharing of ideas.

Participants responded verbally while I recorded the semi-structured interviews using Microsoft Teams. I asked what they remember seeing with respect to informal environmental education on any of the KPU campuses. This was an opportunity for students who are passionate about environmental issues to contribute their voices and ideas to informal environmental education at KPU.

Project Participants

Participation in this research was voluntary and invitations were extended to actively enrolled KPU students across five campuses provided that they were not enrolled in the EPT program, for which I serve as an instructor. Volunteer participants were KPU students over 18 years of age. Participants could not be participating in a Co-operative Education option of any program at KPU, because during part of this research I was an instructor within that department, so I could have been considered to have influence over those students.

Volunteers from all of KPU's five campuses (Richmond, Surrey, Cloverdale, Langley, and Civic Plaza) were invited to participate in this research. Ultimately, only students from the Richmond, Surrey and Langley campuses responded to the call for volunteers. Students who volunteered were accepted into the research, in other words, convenience sampling was used. Convenience sampling is "locating any convenient cases who meet the required criteria and then selecting those who respond on a first-come-first-served basis until the sample size quotient is full" (Robinson, 2014, p. 32). I began by asking instructors I know if they knew of students who would be interested in participating and asked if they could forward on my request to faculty

who might. At the time I was seeking participants and conducting interviews, a friend of mine, a graduate of the EPT program, was the Sustainability Coordinator for the Kwantlen Student Association (KSA) and she assisted me in sharing my request for volunteers. Once I began interviews, I asked participants to let their friends know about the opportunity to participate, and some volunteers did result from this snowball sampling, which is “a recruitment technique in which research participants are asked to assist researchers in identifying other potential subjects” (Oregon State University, 2010).

Another option, if the snowball sampling approach did not prove fruitful, was to email the “all faculty” email group at KPU; however, I felt the convenience sampling approach was more respectful and targeted, and so did not put my call to the “all faculty” email list. Emailing all faculty would produce a more random sample; however, with qualitative research random is not essential. The Tri-Council Policy Statement on Ethical Conduct for Research Involving Humans states that with qualitative research “Samples and research sites ... are chosen because they are viewed as particularly useful or rich sources of information for furthering one’s understanding of phenomena of interest, and not because the results may prove statistically significant” (2010, p. 137).

I emailed a group of about 90 students who had taken a KPU course with me, ENVI 1121 Environmental Issues, and who were no longer students within my influence, with my invitation for participation in this research. My original request to this group resulted in only two volunteers. About a month later I emailed a follow-up to the same group of students with a note that I was still seeking volunteers and I was pleasantly surprised to have eight more volunteers email me in response. Ultimately, 14 participants were interviewed.

Instrumentation/Data Collection

Before conducting the interviews for this research, I developed my questions and conducted a test interview. “By conducting test interviews [with peers or volunteers] the novice researcher gains skills prior to embarking on data collection. ...They furnish the researcher with an opportunity to explore language, the clarity of the questions, and aspects of active listening” (McGrath, Palmgren, & Liljedahl, 2018, p. 1003). I appreciated the value of practising in advance to tailor language, craft clear questions, and practise active listening. Even with this practice, I am of the opinion that research interviewing is a skill which can be continuously improved upon and in which I am definitely not an expert.

One of McGrath, Palmgren, & Liljedahl’s (2018) twelve tips for conducting qualitative research interviews is to build rapport with interviewees. Many (9/14 or 64%) of my research participants had me as an instructor for Environmental Issues (ENVI 1121 at KPU), so they were comfortable discussing the interview questions with me. In addition, I reassured participants that there were no wrong answers to any of these questions.

McGrath, Palmgren, & Liljedahl (2018) also suggest beginning interviews with “a few ‘easy’ questions to make the interviewee comfortable and to familiarize him/her with the subject of the interview” (p. 1003). Along this line of reasoning, I sent participants the interview questions (see Appendix 2) in advance in order to set them at ease and reassure them the interview was meant to simply collect information on their lived experience as KPU students and was not a test of their knowledge. One of my first questions asked for their definition of environmental sustainability, and while this is useful information for my research, it also served as an icebreaker.

In total, I interviewed 14 KPU student volunteers by video, using Microsoft Teams, and I recorded our conversations for transcription. The interviews I conducted ranged from 17 to 31 minutes in duration; most interviews were about 30 minutes long. I asked interviewees to tell what they saw on campus as environmentally minded systems/behaviour/activities/items/ examples. I asked about informal education examples, but a few interviewees still felt inclined to include examples from their courses. I used a semi-structured interview method.

Another reason I chose a semi-structured interview method for this study is because “compared to structured interviews, semi structured interviews can make better use of the knowledge-producing potentials of dialogues by allowing much more leeway for following up on whatever angles are deemed important by the interviewee” (Leavy, 2014, p. 286). A less rigid structure than structured interviews will elicit more detailed information on the participants’ thoughts on sustainable happenings on campus and how it may (or may not) be informal environmental education. Conducting interviews with 14 different students at KPU has provided a variety of insights into informal environmental education at KPU.

Data Analysis

I used Otter.ai (Otter.ai, 2023) to create a rough transcription of each interview from the video audio, and then I watched and listened to each interview recording multiple times while correcting the Otter.ai transcriptions for accuracy. When each transcript was accurate, I sent it to the respective participant for checking and approval, allowing them to correct or expand on their ideas if they wished to.

Once interview transcripts had been approved and/or edited by the respective participants, I read each interview and highlighted phrases which made up data relevant to the

research questions. I entered these key phrases into an Excel sheet indicating which questions the phrases related to. I looked for patterns and themes in order to do content analysis. “Content analysis refers to any qualitative data reduction and sense-making effort that takes a volume of qualitative material and attempts to identify core consistencies and meanings” (Patton, 2015, p. 541).

Because my intention was to explore the informal environmental education on KPU campuses, and I did not want my bias to be overlaid upon the data by predetermining themes and categories, I applied inductive analysis to discover patterns, themes and categories within the data. In inductive analysis “findings emerge out of the data, through the analyst’s interactions with the data” (Patton, 2015, p. 542) as opposed to imposing a predetermined framework on the data.

Limitations, Validity & Reliability

Limitations

Limitations for this study are the small number of participants as well as the self-selection of volunteers and their likely bias towards pro-environmental beliefs. The self-selection of volunteers and their likely bias towards pro-environmental beliefs is a limitation because the study may miss out on insights and contributions from folks who are less savvy about, or experienced with, environmental issues. The more important audience for environmental education is those who know less about it. Preaching to the converted is a cliché, but it expresses what I mean here. It is more important to show folks who are less green-savvy the reasons and ways to be environmentally sustainable because those who are in the know are likely to already be taking actions to behave in an environmentally sustainable manner. In this qualitative and exploratory study, I hope that, by tapping into insights of a small but diverse group of students,

we will be able to consider the data and findings and apply them to strengthening informal environmental education to a broader audience. I did not actively seek them out, however at least two of the 14 interviewees had what I would deem a basic, lower-level, understanding of what could be done on campus to foster environmentally sustainable behaviour. Here I establish a spectrum ranking interviewees and their environmental consciousness.

Low (1-4) = think recycling is the solution to environmental concerns

Mid-range (5-8) = took ENVI 1121, Environmental Issues course at KPU, basic understanding

High (9-10) = more environmental knowledge than me, read IPCC reports

The rankings in this table are my own. In retrospect, it may have been interesting or useful to have participants rank themselves as well. If I conduct further research on this I will include a self-ranking of environmental consciousness.

Table 1

Interviewee level of environmental savviness

	Low					High				
Ranking	1	2	3	4	5	6	7	8	9	10
Tally of interviewees						3	2	6	2	1

A small sample size may be considered a limitation because it does not provide statistically significant data. This research is qualitative, exploratory, and phenomenographic and is therefore not held to the need for large numbers of participants as quantitative studies are. Small sample size may be a limitation, and I do not declare that the results of this research are

the truth or reality. In qualitative research “there is generally a greater emphasis placed on depth of research than on breadth” (Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, and Social Sciences and Humanities Research Council of Canada, 2018).

A delimitation of this study is that I limited my study to students and did not include employees. I chose to do this because my research is focused on education. As an educational institution KPU’s focus is to educate students; educating employees of the institution on environmental issues is a possible, and undocumented, benefit. Another delimitation of this study is that it did not include current students of KPU’s Environmental Protection Technology (EPT) program in an effort to avoid ethical issues: EPT students are within my influence, as I am the program chair and an instructor of a course within the EPT program: ENVI 1121, Environmental Issues.

Reliability & Validity

I had each interviewee review the transcript of their interview. Providing transcripts to interviewees for review is called member checking, or participant validation. Member checking is one method of ensuring trustworthy qualitative data when conducting interviews; “... experience suggests that this process offers novice researcher a good opportunity to check the quality of the data” (McGrath, Palmgren, & Liljedahl, 2018, p. 1005). I am certainly a novice researcher and feel this participant validation assisted in improving the quality of the data for this research.

Biases

In phenomenological research we strive to explore the lived experiences of phenomena, and to not overlay researcher bias or ideas on top of findings. Bracketing is employed to

consciously hold back, or contain, personal bias of the researcher. As Nazir (2016) notes, “all phenomenological researchers agree that bracketing, whatever its form, is essential to ensure the validity of the research to confirm that what is being reported is what is really there and not what she or he wants to see” (p. 183). Also, “bracketing is a method used in qualitative research to mitigate the potentially deleterious effects of preconceptions that may taint the research process” (Tufford & Newman, 2010, p. 80). I aimed to apply bracketing in order to identify and attempt to mitigate my researcher bias. My bias is my belief that environmental sustainability is an essential piece of education. I did my best to keep this in mind while conducting interviews, and strived not to let this influence my coding and interpretation of interview videos. My bias was obvious to study participants due to the fact that I am conducting this research.

As a researcher, I aimed to keep an open and curious mind to explore the lived experiences of students on our campuses. “Reflexivity reminds the qualitative inquirer to be attentive to and conscious of the cultural, political, social, linguistic, and ideological origins of one’s own perspective and voice as well as the perspective and voices of those one interviews and those to whom one reports” (Patton, 2015, p. 70). According to Roni (2015, p. 220), reflexivity is where the researcher acknowledges that their position and/or situation may affect the research process and outcome. It is a strategy which I applied to try to mitigate bias in this research.

Ethics

This research project secured approval from both the RRU and KPU Research Ethics Boards. Informed consent was obtained before data was collected from participants. Data was stored in a secure manner on my KPU OneDrive. In order to prevent the identification of

individuals, numbers were assigned to participants. No names or identifying information were used in the recording nor reporting of data in order to achieve privacy, confidentiality, and anonymity for participants.

There were no risks to my participants that might result from their participation in the study; neither their grades nor their academic standing were affected. I am a faculty member at KPU and while I may gain personally from this project in the form of networking and increased connections within my workplace, I do not stand to gain financially from this research so I do not believe there are significant conflicts of interest. While there could be perceived conflict of interest because I am an instructor at KPU and this research involves students, no interviewees were students in the Environmental Protection Technology program, in which I coordinate and teach. Many interviewees were past students of mine (non-EPT students who took ENVI 1121, Environmental Issues, as an elective) but their final grades had all been submitted for that course before they were invited to participate in this research. I am unlikely to have these students in a future class, as at this time I teach only the one course; this is another factor removing a potential future conflict.

To ensure rigor and transparency, transcripts of the interviews were shared with the research participants electronically for review and I invited them to review transcripts and make changes if they wished.

Findings

The goal in this phenomenographic study was to collect information on student experiences and ideas of pro-environmental events, systems, instances, or activities on KPU campuses, as well as to ask for ideas on how to improve informal environmental education at

KPU. Interviews with a small but varied set of students have provided data and findings which may be applied to strengthen informal environmental education to a broader audience. When seeking volunteers, I did not set parameters requiring a variety of levels of environmental savvy, however, as previously noted in Table 1 at least 2 interviewees had what I would call a very basic understanding of what could be done on campus to foster environmentally sustainable behaviour.

In order to set participants at ease and start our conversation, the first question I asked each interviewee was to tell me How do you define environmental sustainability or pro-environmental behaviour? All participants had thoughtful, if sometimes brief, responses for this question which included concepts such as “behavior that tries to reduce the impact of your personal life on the natural world” (001) and “sustainability is doing things to keep the world intact for future generations” (002) in their definitions of environmental sustainability, or pro-environmental behavior. The responses reassured me that they were interested in this research and wanted to contribute to it.

To someone who has worked in KPU’s post-secondary environment for over 20 years, some interview results are predictable, such as observations that the recycling system can be improved, and KPU’s lack of on-campus residences does not foster a strong sense of community. However, they also contain interesting insights and ideas. Here is a summary of the results of the pro-environmental, or environmentally sustainable, examples and events interviewees have seen on campus.

Pro-environmental, or environmentally sustainable examples and events seen on campus

In this exploration of informal environmental education at KPU, question two was *What pro-environmental, or environmentally sustainable examples and events do you see on campus?*

I sorted answers to this question into themes, and have listed them here in the order of the number of times students mentioned them. Note that some interviewees may have mentioned an item multiple times within one interview.

- solid waste (23 mentions)
- transportation (10 mentions)
- events (8 mentions)
- food (plant- vs animal-based) (6 mentions)
- green space (5 mentions)
- climate (4 mentions)
- online educational resources (OER) (4 mentions)
- program specific items (4 mentions)
- energy (2 mentions) and
- 2 miscellaneous items (hand air-driers in washrooms, and KPU's sustainability plan).

Within the theme of *solid waste*, students primarily mentioned *water bottle refilling stations* as a pro-environmental thing in place on KPU campuses. Eleven out of fourteen interviewees mentioned them, and this may be due, in part, to the fact that I used water bottle refilling stations as an example of pro-environmental things on campus in my request for volunteers (see Appendix 1). It is also a very visible and tangible example of an action individuals can take in reducing their consumption of plastic water bottles, with the added bonus that most water filling stations have a digital tally of how many plastic bottles have been 'saved' (not used) by patrons using the refill station.

Also within the theme of *solid waste*, most students mentioned the *garbage and recycling systems* on campus. Nine out of fourteen students mentioned these solid waste management systems. The mentions were sometimes positive, in that they are good examples of informal environmental education, but many interviewees felt that users are confused and unsure of where to place some items, so they deduced that signage and user training can be improved. A few interviewees noted that, in their visual assessment, the majority of solid waste seems to be created by single-use containers for beverages and food.

Within the 14 interviews, *transportation* was mentioned 10 times, by seven (50%) of the interviewees. Items such as the intercampus shuttle (run by the Kwantlen Student Association (KSA)), public transportation, cycling, and electric vehicle charging stations were identified as environmentally sustainable actions witnessed by KPU students.

Events identified by the interviewees which are environmentally minded were the farmers markets (four mentions) which used to be held on KPU's Langley and Richmond campuses; sustainability week (hosted by KSA) which is typically in October; and sales of vegetables from the farm school (Richmond campus only). Only four out of 14 students named events which struck them as pro-environmental. Interviews occurred during the pandemic, and in-person events were prohibited for a while and are only recently re-starting, so this is to be expected. It is difficult to say if this result would be any stronger pre-pandemic, due to the commuter campus nature of the institution. More on the commuter campus culture and its impacts on pro-environmental behaviors is mentioned further along in the discussion.

Four out of 14 students mentioned *food*-related topics, such as food services offering plant-based or vegan meal options, and KPU cafeteria partnering with KPU's Sustainable

Agriculture program to use their potatoes for fries. The mention of the cafeteria using potatoes from the Sustainable Agriculture program was by a student who is exceptionally aware of green happenings on campus. The use of Sustainable Agriculture (Sust. Ag.) potatoes in the Richmond campus cafeteria for French fries was advertised by poster in the cafeteria as well as through the Sust. Ag. program's social media (R. Harbut, personal communication, November 30, 2022). Dr. Harbut feels the communication could have been improved and/or more widespread, but did not state how. Anecdotally, I know from our work together in KPU's Environmental Sustainability Committee that Dr. Harbut is in favour of KPU better promoting our green initiatives somehow, perhaps in a repository of green happenings on campus. I do not believe the use of Sustainable Agriculture potatoes in our cafeteria was shared on Today@KPU (KPU's internal information sharing tool, emailed to all employees) and it should have been, perhaps every semester, or even once a month during the collaboration. I can also envision some social-media promotion of these green happenings on campus.

Five out of 14 students mentioned *green space* as something pro-environmental that they noticed on KPU campuses. While it was indicated as something which is already evident and in place, most interviewees who brought it up also indicated that *green space* on campus could be expanded or improved on as well. KPU has a Natural Spaces Advisory Committee (NSAC) and during this research I reached out to learn more about the committee, and have joined it in order to get a sense of what their goals are and if the results of this study can help them in their work.

Climate was mentioned four times, by only two participants as an issue they have seen showcased or identified informally (not in classrooms) at KPU. Related to minimizing resource consumption, *Online Educational Resources (OER)* such as course websites and digital resources

instead of traditional textbooks, were mentioned four times by three different interviewees.

Students appreciate not only the lower costs of OER, but also the environmentally sustainable nature of not having to purchase textbooks which quickly go out of date.

Program-specific items, which evolved in interviews even though I specifically asked students about informal education examples, were mentioned four times, by three participants. Items mentioned were incubator plots that are available to sustainable agriculture students (the student noted this is a valuable opportunity which UBC did not provide for their agriculture students at the time when she was comparing programs); the brewery program has a wastewater treatment system for effluent before it is discharged into the municipal sewer system; and it was noted that both the brewery and fashion marketing programs incorporate sustainability into their course materials and projects. There are numerous examples of formal pro-environmental education at KPU, and as I type this, there is a project mapping the courses which incorporate the UN Sustainable Development Goals. Environmental education within courses at KPU is not within the scope of this research; I am focused on informal education.

Energy usage was mentioned by two interviewees. One mention was with respect to the use of natural lighting, specifically on the Richmond campus, and another was related to folks being encouraged to use stairs instead of elevators. A few *miscellaneous* items were brought up: upgrades to washrooms, making them more water efficient, and installing electric hand driers to replace paper towels. Another student was aware that KPU has a sustainability plan, due to having looked it up during research when taking a class on Environmental Issues.

In summarizing pro-environmental examples events, systems, and instances student interviewees mentioned in our interviews, items most mentioned as pro-environmental examples

they see on KPU campuses are bottle-filling stations, places to recycle and compost, sustainable transportation options, events, and food options. Single-use food or beverage containers were, anecdotally, observed to be a significant contributor to campus solid waste; this indicates opportunity for reducing solid waste on campus. Transportation was mentioned by 50% of interviewees, so it can also be an opportunity, if not a significant example of current informal EE. There is opportunity to increase green/sustainable/climate events on campus, and these can incorporate food within them. Green spaces, and the intentional care of them is an example of pro-environmental behavior students have observed on campus. The next question in this research, discussed below, inquired about what did student interviewees consider to be informal EE.

Informal education teaching pro-environmental values

For question three, I asked participants: *In your eyes, is informal education an effective way of teaching pro-environmental values?* Most interviewees agreed that informal education, essentially leading by example, can encourage pro-environmental behavior and values in people. Almost every interviewee felt that there is an opportunity to do more; interviewees expressed KPU can make more of an impact by intentionally incorporating informal environmental education into their systems. Direct quotes from participants with respect to challenges (such as reducing solid waste and improving community and sense of place) are:

- “disposable cups and things - where do these items go?” (001);
- “[KPU] definitely try to separate the streams and they try to promote students to use the bins properly, but it's super confusing” (001);

- “I don’t necessarily think that our pro environmental behaviors are because we care about the climate. I think a lot of them are, [due to] convenience” (001);
- “recycling bins, lots but not the best. There's not good signage on them” (002);
- “in the cafeteria ... everything's all wrapped in single use plastics, they still [sell bottled water]” (008);
- “Unfortunately, I think Kwantlen really lacks a sense of community. And I think that has a lot to do with it... Kwantlen doesn't really have the same sense of community that a lot of other universities have. It's really difficult to build a sense of not only community but like ownership over your, you know, your place at the university. We really don't feel like... you don't really have that emotional attachment to it” (009).

Challenges identified with pro-environmental activities on KPU campuses

I did not ask students about the challenges they see with pro-environmental activities on KPU campuses; however, the format of semi-structured interviews naturally created space for these thoughts and concerns to be voiced by interviewees. The challenges for pro-environmental behaviours which students discussed were both specific to KPU, as well as larger societal issues. I have sorted the challenges to pro-environmental behavior, identified by the KPU students interviewed for this study, into the following themes:

KPU has the need for (KPU can improve informal EE with):

- Reducing campus solid waste;
- Stronger community, student life, sense of belonging;

- Changing social norms, fostering pro-environmental habits, and decreasing consumption;
- Convenient pro-environmental options, (people are busy);
- Intentional environmental communication;
- Continuity of pro-environmental student initiatives and cohesive systems.

These issues can be reframed into opportunities, or be incorporated into ideas and suggestions for improving informal EE at KPU. These opportunities can be grouped into categories, taking their scope into consideration. There is a range of opportunities which are somewhat easily addressed on the smaller scale of a post-secondary campus, and there are more broadly challenging opportunities which are much larger and impact society as a whole.

Suggested groupings in these categories are as follows:

Table 2

Opportunities for improving informal environmental education at KPU

Micro	Need for intentional environmental communication Need to reduce campus solid waste
Meso	Need for convenient pro-environmental options Need for continuity of student initiatives and cohesive systems Need for stronger community, student life, sense of belonging
Macro	Need for changing social norms, fostering pro-environmental habits, and decreasing consumption

How some of these challenges can be re-framed into opportunities will be explored in the discussion section.

How to enhance informal environmental education at KPU

As the final interview question, I asked participants *in your imagination, what can be improved to enhance informal environmental education at KPU?* Responses to this question provided a variety of information and suggestions. As you can see from the themes listed here, there is some overlap between the issues identified above and suggestions for improvement. The themes which evolved during the analysis of these suggestions are:

- Reducing campus solid waste and pursuing zero-waste,
- Making green options convenient, influencing/shaping social norms,
- Enhancing intentional environmental communication (EC),
- Hosting more pro-environmental events (connected to intentional EC),
- Increasing green space and rainwater use (connected to intentional EC),
- Promoting and facilitating public and active transportation.

Themes are briefly fleshed out here, giving snippets of answers, and will be discussed in more depth in the discussion section below.

Many students noted that improvements can be made to *reduce campus solid waste*. Students felt signage about the existing waste systems can be improved, and the idea that KPU needs to “move more towards zero-waste on campus” (001) was mentioned. This idea of *pursuing zero-waste*, in terms of providing only sustainable and re-useable options in foodservices, aligns well with the suggestion that KPU work on initiatives to *Making green options convenient, influencing/shaping social norms*. As one interviewee mentioned, “You're

gonna [sic] have more pro-environmental behaviour if there is no bad option. If [people] have to choose between a [ceramic] plate or plastic take away container that they have to return” (001) then the social norm on KPU campuses moves closer to zero-waste for food services. In the above quote, the interviewee is referencing the plastic takeaway container as one which is in a circular deposit-based system and will be returned for re-use.

Enhancing environmental communication and hosting more pro-environmental events are sound suggestions from KPU students which can be leveraged towards initiating and informally teaching more pro-environmental behavior in our communities. They are closely linked to things like *increasing green space and rainwater use* because in addition to providing green space for the KPU community, and capturing, storing, and using rainwater in irrigation systems can be intentionally communicated to people in order to become a piece of informal environmental education. Some pro-environmental things happening at KPU are unexceptional (such as recycling and providing bicycle racks, and indeed, they are viewed as commonplace by some worldviews such as Postmodern and Integrative Worldviews), so the communication should be careful and respectful. As one student mentioned, some of these things like recycling and water bottle filling stations are unexceptional. They are, however, teachable items to many members in our communities who are still learning about environmentally sustainable actions and behaviours. Communication can explain the rationale behind the steps to promote sustainability. Communication can demonstrate what actions should be taken to behave environmentally and sustainably without the risk of being perceived as greenwashing. Merriam Webster (2023) defines greenwashing as “the act or practice of making a product, policy, activity, etc. appear to

be more environmentally friendly or less environmentally damaging than it really is”

("greenwashing," para. 1).

An example of intentional environmental communication would be posting educational information about the benefits of composting near campus organics disposal bins. As Metro Vancouver (2023) states:

In the landfill, buried under layers of waste and without access to oxygen, food can't decompose properly. Food buried in the landfill creates methane, a greenhouse gas linked to climate change that's roughly 30 times more potent than CO₂. When food scraps are composted, they produce way less greenhouse gas. In our region, recycling one tonne of food scraps prevents the equivalent of 0.4 tonnes of CO₂ emissions compared to disposal. (Metro Vancouver, About Food Scraps Recycling).

Transportation was identified as an issue which KPU could use as an example to communicate and support informal environmental education. Promoting and facilitating public and active transportation as pro-environmental behavior is an opportunity for KPU.

Transportation is a significant contributor to our climate crisis; the transportation sector is the largest GHG emitting sector in British Columbia, at 37% of emissions (Canada Energy Regulator, 2021). According to the Intergovernmental Panel on Climate Change (IPCC) “In 2019, direct greenhouse gas (GHG) emissions from the transport sector ... accounted for 23% of global energy-related CO₂ emissions. 70% of direct transport emissions came from road vehicles” (Jaramillo et al., 2022). Because of this, KPU should encourage and support the use of public transportation and active transportation to and from its campuses. While improvements to

public transportation in each KPU neighbourhood are not realistically within the scope of KPU's power, creating campuses and culture which support and encourage active transportation is.

This section presented the findings of my research, namely the items interviewees see as pro-environmental actions, as well as challenges to these actions being effective informal EE. The section also began to present ideas on how to enhance informal environmental education at KPU. The following Discussion section dives into more detail on applying worldviews, as a lens to explore improving informal EE at KPU, and perhaps on PSE campuses in general.

Discussion

The aim of this research is to explore if, in the eyes of students, environmentally sustainable management on campus is influencing or informally teaching students. Several studies (Barth, Godemann, Rieckmann, & Stoltenberg, 2007; Chiong et al., 2017; Winter, & Cotton, 2012) identify that informal teaching and learning on campus, teaching not formally delivered in classrooms or labs (also known as hidden curriculum) influences students' ideas of sustainability. Green campus operations, environmental sustainability events on campus, and pro-environmental extracurricular activities can all contribute to teaching students about environmental issues and sustainable behaviour.

Environmental worldviews are the theoretical lens I am applying to the results of this research, in an attempt to illuminate the situation. Modern, Postmodern, and Indigenous environmental worldviews are considered, in particular with respect to environmental communications and informal EE. Kohl (2021) explains that humans experience different worlds despite the fact that we all live on the same Earth; he states that the resulting worldviews impact

individual viewpoints on climate change. “People holding different worldviews don’t just see different parts of climate change, they live in entirely different worlds” (Kohl, 2021, p. 1).

According to de Witt (2015), the *Modern* worldview has some aspects which are advantageous to the pro-environmental cause: “commitment to (the results of) science” (p. 911), “Sense of universal human rights and human dignity; Commitment to science and technology” (p. 911) as well as disadvantages to environmentalism such as: “Instrumental (exploitative) approach toward nature; Materialism, hedonism, consumerism” (p. 911). Some student interviewees expressed concern about materialism and consumption, and how this is an acceptable, possibly predominant, behaviour on the campuses of KPU. Their concern is based in their understanding that this behaviour contributes to our climate crisis. In a summary of the *Laudato Si’* Rice (2022) tells us that the 184-page encyclical letter “recommends a lifestyle focused less on consumerism and more on timeless, enduring values. It calls for environmental education, joy in one’s surroundings, civic love [and more]” (para 17, summary of Ch. 6). The *Laudato Si’* validates the idea that capitalism and hyper consumption behavior is a driver of our climate crisis and so informal EE on campus may be one of the many influences needed to help move our society towards Postmodern and Indigenous worldviews. Bolstering efforts in informal EE, such as *pursuing zero-waste, enhancing environmental communication (EC), and making green options convenient* on KPU campuses can help shape ideas and values, or social norms.

Postmodern environmental worldview includes the “commitment to green values” and a “critical attitude toward modern consumerism and reductionism” (de Witt, 2015, p. 912). Many student interviewees expressed aspects of this worldview, and were critical of modern consumerism and the negative environmental impacts it has. Interviewees asked questions such

as: Can KPU reduce on-campus purchases of bottled water and disposable food service packaging and also incorporate environmental communications about why this is important? Can we promote items such as the Kwantlen Student Association's re-boot program (<https://kusa.ca/reboot-computer-repair/>) and mention that repairing items is not only a way to save money, but also to act sustainably?

Indigenous environmental worldviews, in general, are land based, and focus on humans living in relationship with nature, as opposed to Western worldviews of humans exerting control over nature (Wilson, 2014, p. 8). The Indigenous worldview includes “intentions that First Peoples have to care for the land in a spirit of reciprocity, stewardship and relationship” (Littlecrane Consulting, 2021, p. 11).

In *Restoring the Kinship Worldview* (2022) Topa and Narvaez explain “the Indigenous worldview allows for a large sense of community, a belonging to the overall Commonsense, a deep sense of kinship with All” (p. 112) and that “Kincentricism is the first step toward returning to an earth-based consciousness, a starting place for relocalizing or restoring place-based knowledge” (p. 73). A major shift in worldviews within our communities towards living in reciprocity, stewardship, and relationship with our land, water, and air would be a drastic change with potential to allow Earth to repair systems damaged by human use and overconsumption. Fostering Kincentricism, the Indigenous worldview, at KPU may bolster informal environmental EE both on campus and beyond.

During my interviews, some students did voice ideas of their definition of sustainability and pro-environmental behavior being actions to reduce our impacts on the natural environment. One interviewee stated, “sustainability is this idea of being able to live sort of a coexistence with

the world, the earth without consistently destroying and taking more than we give” (interview 006). Another defined sustainability as “any behavior that tries to reduce the impact of your personal life on the natural world. I think it's never possible to have no impact, but anything that people do to attempt to reduce their impact on whatever natural system they're considering” (interview 001).

During my learning over the past few years I have discovered that Indigenous worldviews are rooted in the ability to live with our natural environment, being grateful for the gifts it provides, and taking only what one needs. This is in contrast to non-Indigenous Modern worldviews, in which the norm is requiring comforts and convenience, which leads to excessive consumerism, harming our environment and contributing to the climate crisis. In 2006/2007, Indigenous Elders, scholars and knowledge-keepers gave voice to *The First Peoples Principles of Learning* to guide the development of the curriculum and teaching of an English First Peoples course created by the BC Ministry of Education and First Nations Education Steering Committee (First Nations Education Steering Committee [FNESC], n.d.).

The Principles are as follows:

- Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors.
- Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place).
- Learning involves recognizing the consequences of one’s actions.
- Learning involves generational roles and responsibilities.
- Learning recognizes the role of Indigenous knowledge.
- Learning is embedded in memory, history, and story.
- Learning involves patience and time.

- Learning requires exploration of one's identity.
- Learning involves recognizing that some knowledge is sacred and only shared with permission and/or in certain situations.

The Principles represent an attempt to identify common elements in the varied teaching and learning approaches that prevail within particular First Nations societies. It must be recognized that they do not capture the full reality of the approach used in any single First Peoples' society (n.d.).

In my eyes five of these First Peoples Principles of Learning (listed above) are key to informal environmental education and environmental issues generally, and are relevant to this study:

Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors.

Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place).

Learning involves recognizing the consequences of one's actions.

Learning involves generational roles and responsibilities.

Learning recognizes the role of Indigenous knowledge.

“Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors” (FNESC, n.d.) can be seen as tied to informal environmental education on KPU campuses because within education, all of these factors (self, family, community, land, spirits, and ancestors) are important and impacted by our attitudes towards our environment. Personal well-being is enhanced by spending time outdoors in natural spaces

(Abookire, 2020). Our community and lands benefit when people learn to value and respect our natural environment. Spirits and ancestors, well, if FNESC believe their well-being is supported by learning, then who am I, an uninvited settler on this land, to question this?

“Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place)” (FNESC, n.d.). Informal environmental education, such as green space and purposeful environmental communications, at KPU can point out and actively support connectedness to the local lands, as well as the sense of place of our community members.

“Learning involves recognizing the consequences of one’s actions. Learning involves generational roles and responsibilities” (FNESC, n.d.). These statements are especially poignant in my eyes. The consequences of our actions are significant when it comes to environmental issues. Not only our day-to-day actions, which constitute our footprint, so to speak, but also the consequences of our plans, politics, and ambitions.

KPU has a responsibility to educate students and employees sustainably and to keep in mind the moving parts and complex systems in which we live, study, and work. This connects with the premise that learning should recognize consequences of our actions, and involve generational roles and responsibilities.

Lastly, in these five First Peoples Principles of Learning, “learning recognizes the role of Indigenous knowledge” (FNESC, n.d.). This is applicable to environmental education because holistic and kinship worldviews emphasize our interconnectedness with our living environment,

and KPU has outlined a commitment to “supporting Indigenization, Decolonization and Reconciliation” in *xé?elł Pathways to Systemic Transformation* (2023, p. 10).

On June 20, 2023, KPU launched the *xé?elł Pathway to Systemic Transformation Framework*. One of the six pathways within this plan is “Weaving Indigenous Worldviews: Foster sense of belonging, personal growth, well-being, and empowerment” (KPU, 2023). Interviewees indicated a lack of community as one area for improvement in the teaching of informal environmental education at KPU. As educational influencers, hosting events to foster stronger sense of belonging and community could be our institution leading by example. Events and connection with community can bolster informal education, and may hopefully help us move away from colonial or western worldviews and towards more wholistic worldviews. This may give more widespread prominence to Indigenous worldviews and encourage pro-environmental behaviour.

Pro-environmental, or environmentally sustainable examples and events seen on campus

I asked interviewees 1) how they define environmental sustainability, or pro-environmental behavior? 2) what pro-environmental, or environmentally sustainable examples and events do they see on campus? 3) in their eyes, is this informal education an effective way of teaching pro-environmental values? And 4) in their imagination, what can be improved? The outcome of these 14 interviews provided qualitative data and insight on all four of these questions, and also identified challenges with two topics: the current systems on campus which are pro-environmental, and also with the use of these, or their effectiveness, as informal environmental education.

In the experience of KPU students who were interviewed, the five main themes of pro-environmental, or environmentally sustainable examples and events seen on campus most often are *solid waste, transportation, events, food, and green space*. Interviewees gave examples of what they have experienced, and many of them voiced the opinion pro-environmental examples and events at KPU can be strengthened in order to be more impactful as facets of informal environmental education.

Solid Waste.

Every student interviewed in this research mentioned solid waste issues, such as recycling and water bottle refill stations. Water bottle refill stations are a concrete and simple example of a pro-environmental item on campus. A few interviewees noted they are commonplace and unexceptional as far as informal environmental education; nevertheless, they are tangible and actively facilitate the re-use of drink containers. They should continue to be provided to the KPU community.

In new developments, the design and creation of communal kitchen spaces would be a solid step in leading by example in allowing the community to use, wash, and re-use dishes, utensils, and more. Due to the pandemic there has been a significant movement away from using personal and re-useable items, which frustrates those who are actively trying to reduce their use of resources. As time moves on, I have seen some businesses remedy their wasteful pandemic policies and return to using or allowing, for example, personal cups for coffee. At the same time, some companies seem extremely reluctant to move away from disposable materials. I suspect, in this current economy, there are apparent cost savings in using disposable dishes instead of paying employees to wash dishes. This of course ignores the hidden costs, or externalities, of

using disposable materials. “An externality is a cost or benefit caused by a producer that is not financially incurred or received by that producer. An externality can be both positive or negative and can stem from either the production or consumption of a good or service” (Kenton, 2022, p. 1).

Disposable materials have externalities such as air pollution caused by the fuel burned to power transportation of the new materials to the site of use, as well as the waste materials to landfill, recycling, compost, or incinerator. Another is the methane (a significant greenhouse gas) created by decomposition of organic materials, and the resources (water, raw materials, and energy) used in the production of the materials. Paper or wood products require the use of forests, and plastic materials are derived from crude oil, natural gas or coal. Of course, re-useable materials also have these externalities, but ideally their externalities are lessened when divided up over the number of uses of the object, with the addition of water and soap needed to wash them between uses. Nothing is simple.

Recycling, or the availability of a robust recycling system, which is considered another ordinary instance of informal environmental education, is criticized by some student interviewees because the recycling streams (paper, organics, containers, etc.) appear to be contaminated often. If recycling is contaminated with organics, or other materials which are not accepted in that recycling stream, then the whole bin may wind up destined for landfill. ‘Wishcycling’, the action of being uncertain so toss it in there and hope for the best, is detrimental to recycling rates. Perhaps not enough users are aware of this issue of contamination, and need to be told this. Signage needs to make it abundantly clear which materials go in each bin.

As many people know, not having to recycle at all, meaning not purchasing the item with plastic packaging or single-use life, is the greener option over recycling and solid waste management. When applying a lens of worldviews, this is in conflict with the modern worldview embracing materialism and consumerism. This leads us to the concept of zero-waste, and the question of what can be done on a post-secondary campus to encourage zero-waste? A zero-waste lifestyle is more likely to be adopted by people holding the post-modern worldview, which embraces a “critical attitude toward modern consumerism and reductionism” (de Witt, 2015, p. 912). Some of the students I interviewed asked what can be done about the waste. They identified that so much of the waste they see is single use plastic drink cups; how can KPU instead facilitate the use of reusable items? One creative and practical option is ShareWares.ca, a circular sharing system already in use at UBC and SFU. ShareWares.ca incorporates paying a \$5 deposit for a drink in a reusable plastic mug. Once the drink is consumed, then the mug is returned for the deposit, or it can be swapped for a clean mug containing a new drink. Another example is a system of re-useable takeout containers in foodservices, based on a deposit system. The up-front cost may be steep, but possibly, over the long run, there would be cost savings for foodservice providers, as well as for waste collection fees paid by the institution. A life cycle analysis comparing disposable items and ceramic dishes could be conducted; ideally this would take into consideration more than financial implications.

An interesting example one student pointed out, which potentially leads to less waste and helps slow consumption of electronics, is the computer service offered by the Kwantlen Student Association (KSA) to students. They believe “there are a lot of people who might be inclined to replace something that they don't know how to fix. If there is any kind of way that students are

notified of this service, and can prevent that or at least delay that” (014). This appears to her to be a piece of informal environmental education. It could be promoted and made more explicit: not only can students save money, but they will be preventing electronics going to waste for just a bit longer.

Transportation.

Transportation is a significant opportunity for pro-environmental behavior and culture on campus. This includes the use of public transit, which is encouraged by the U-Pass BC, provided, for a fee, to KPU students by the KPU Student Association (KSA). One student mentioned that proximity to fast and reliable public transportation encourages pro-environmental behaviour. As a student on the Richmond campus, she notes that “a lot of people ... had cars, but instead utilized the Canada line. And so that did have a big impact for them” (009). KPU’s intercampus shuttle is another example of sustainable transportation for students and employees who need to move between the Surrey, Cloverdale, and Langley campuses. Not all interviewees realized that parking at a campus closest to them and then taking the shuttle is a ‘green’ behaviour. The intercampus shuttle can be promoted as such, if there is need to increase shuttle ridership.

Visual support of active transportation is another opportunity for informal environmental education at KPU. Bicycle lockers are provided by the KSA for safer storage of bicycles, and are well used. “Surrey’s [bike lockers] are always full. Langley’s are always full” (001). Providing facilities such as showers for cyclists can also help foster the culture of active transportation as a pro-environmental behaviour. Expansion or improvements of walking and cycling infrastructure will demonstrate that KPU values and supports those modes of transportation. At this time

electric vehicle charging is available on KPU's Richmond, Surrey, Civic Plaza, and Tech (Cloverdale) campuses, not on the Langley campus.

Community members with individualistic values and more traditional worldviews may be less inclined to take public transportation and prioritize their own convenience and mobility in single occupancy vehicles. Holistic, or wholistic Indigenous worldviews “see the whole person (physical, emotional, spiritual, and intellectual) as interconnected to land and in relationship to others (family, communities, nations)” (Cull et al, Indigenous Ways of Knowing and Being). This holistic worldview means connection to community is important and caring for everyone in the community takes priority over self-serving, capitalistic, ideas and actions. According to Liebenberg et al (2019) “Indigenous culture is inextricably linked to land/place; a collectivist sense of community and self emerges from this place-based understanding” (paragraph 5). Community members with collectivist values may be more inclined to take public transportation as it is a way to care for this place, the land we live upon.

When I attended the City of Surrey's Indigenous People's Day celebration in June, 2023, I noticed young adults coming and checking on the elderly who were selling arts and crafts at vendor tables. They were taking food to them, and then at the end of the event a few were letting the elders know that they were going to be giving them rides home. Perhaps this is only unique to me, but this is something I have only seen within families, not larger communities and, sadly, not something initiated by younger adults. It spoke to me of a larger sense of community, and a holistic, collectivist culture.

Supporting and strengthening community connections and Kincentric values could increase feelings of community safety, and therefore increase willingness to use public

transportation. One of the barriers to using public transportation is fears for safety, especially in women. When active transportation involves more people, there are more community members out there and ideally looking out for one another's well-being. Promoting carpooling among employees and students would be encouraging pro-environmental behavior, as well as a way to build community when people who would not normally interact enter into a ride-sharing relationship.

Events.

Events were identified eight times by four interviewees as pro-environmental activities on KPU campuses. The pandemic may have had an impact on this stream of data, in that events have been far less frequent and the move from in person events to online ones has had mixed success. The most noted event is the farmer's markets, which used to be hosted on Langley and Richmond campuses. Unfortunately, those farmer's markets are no longer located on KPU campuses.

xé?ełł KPU Pathway to Systemic Transformation commits KPU to an ongoing process of systemic transformation through actions detailed in six pathways, one of which is *Weaving Indigenous Worldviews: Foster sense of belonging, personal growth, well-being, and empowerment* (<https://www.kpu.ca/indigenous/activities>). One item within this pathway is "Host welcoming events and community circles to support students sense of belonging to connect with their peers in classroom settings" (xé?ełł KPU Pathway to Systemic Transformation, p. 17). This is a commitment already made, and so it is a happy coincidence that this work can support informal environmental education at KPU. Community events, open to all, such as celebrations and Pow Wows, are an opportunity to share Indigenous worldviews, including how shared

responsibility for our environment is within them, as well as strengthen the sense of community at KPU, which interviewees did identify as an area which needs improvement.

As mentioned a few paragraphs above, Cull et al explain that holistic Indigenous worldviews include “interconnected[ness] to land and in relationship to others” (Indigenous Ways of Knowing and Being). Encouraging and fostering Indigenous worldviews in the KPU community may assist in promoting the use of public transportation, and fostering more events on campus may also strengthen our community. In general, pro-environmental events at KPU are an area of opportunity for growth. Supporting and hosting pro-environmental events which include Indigenous partners, values and worldviews which are holistic in nature, are an opportunity for informal EE at KPU, as well as to foster a stronger sense of community for students and community members.

Food.

In the eyes of four research participants, the availability of plant-based options in food services is a pro-environmental action. One student noted that “we do have vegetarian options, but there are very few... maybe even no vegan options” (004) and it was suggested by a few interviewees that more plant-based options should be offered by food services on KPU campuses.

With respect to worldviews, modern worldviews might not explicitly connect our food to our environment because they are anthropocentric and view the environment as serving the needs of humans. Currently, “systems to produce, package and distribute food generate a third of greenhouse gas emissions and cause up to 80 per cent of biodiversity loss” (UN Climate Action Fast Facts, Food and Agriculture, Feb 2022). Amplifying holistic worldviews may help people

make a stronger connection between food production (and waste) on climate change and other environmental impacts.

Severe weather, storms and floods created by human overuse of fossil fuels for energy has negative impacts on our food security. “The unsustainable use of land, soil, water and energy for food contributes to greenhouse gas emissions that cause rising temperatures. Higher temperatures in turn affect resources to produce food” (UN Climate Action Fast Facts, Food and Agriculture, Feb 2022). Historically, Indigenous people worked in reciprocity with the environment, the lands and waters, when harvesting foods. They give thanks when picking berries and fishing for salmon, and took only what they needed. In *Braiding Sweetgrass*, Robin Wall Kimmerer (2013) advises us to “Take only what you need... Never take more than half. Leave some for others. Harvest in a way that minimizes harm. Use it respectfully. Never waste what you have taken. Share. Give thanks for what you have been given” (p. 221). When salmon returned to spawn, there was an amount of Indigenous people waited before fishing, so as to let the strongest of the salmon reproduce in order to assist with and benefit future generations (Indigenous Foundations, n.d., 6th para). A more holistic worldview connects the dots between the health of our land and our own physical health, as we rely on our soil, water, and the ecosystem to be healthy in order to grow food we rely on. Hosting events to raise up indigenous voices and worldviews on KPU campuses would contribute to informal environmental education.

Green Space.

Outdoor green space was noted by four students as one aspect of pro-environmental behavior. One student mentioned “the forest area on the Surrey campus. I thought the fact that that is there and is being maintained is like a very tangible example of the care for the

environment” (014). Two interviewees mentioned the terrace gardens on the Richmond campus, which is formerly monoculture lawn space, converted to learning gardens for the Sustainable Agriculture program.

xé?ełł KPU Pathway to Systemic Transformation commits KPU to an ongoing process of systemic transformation through actions detailed in six pathways, one of which is *Weaving Indigenous Worldviews: Foster sense of belonging, personal growth, well-being, and empowerment* (<https://www.kpu.ca/indigenous/activities>). An item within this pathway is relevant to informal environmental education and applying Indigenous worldviews to assist with it: “Create physical and virtual spaces at each of the five campuses that reflect Indigenous peoples’ histories, contributions, languages and diversities” (xé?ełł KPU Pathway to Systemic Transformation, p. 17). Some of this space to reflect Indigenous peoples’ histories, contributions, languages and diversities can be outdoor informal environmental education space. With intentional planning and signage, Indigenous Environmental worldviews can be shared and supported.

Currently there is work happening to create an outdoor classroom on the Surrey campus, and this has been created in consultation with KPU’s Indigenous Advisory Committee. It will be circular in structure, incorporating Indigenous teaching pedagogy, and will include natural elements of wood and stone.

Informal education teaching pro-environmental values

Interview participants support the idea that informal environmental education can be effective, and they also believe that it can be improved upon at KPU. Almost every interviewee

felt that there is room for improvement; KPU can intentionally incorporate informal environmental education into their systems and have more of a positive impact on our communities.

Only two out of 14 interviewees voiced the opinion that informal environmental education is not effective. Their concern is that in their eyes what is currently happening is not effective enough; it is not explicit enough. One interviewee identified that some of what can potentially be identified as informal education is unexceptional and commonplace. Things like water bottle filling stations and separating waste for recycling and compost is ‘the norm’; these are now seen everywhere. This is an entirely valid point and an interesting insight to how some students view the more simplistic pro-environmental happenings at KPU. While some students view basic pro-environmental behavior as having an environmental education impact, others disagree.

This leads us to the concept of worldviews and how they shape perceptions and behaviours. There are diverse worldviews in the KPU community, and perhaps in any post-secondary institution. If many, or most, were at the level of postmodern or Indigenous worldviews, it would be apparent and easy to identify. What can be done to communicate to all worldviews and encourage pro-environmental behaviour?

One opportunity is that, according to KPU’s Office of the Provost & Vice President, Academic, KPU’s indigenous strategy will aim to “enhance current practices and identify new actions which will: create university-wide awareness of indigenous perspectives, cultures, traditions, histories and ways of knowing among all members of the university community. ...

[and] leverage the value indigenous ways of knowing can contribute to our overall educational mission” (KPU, n.d.)

With respect to informal EE one interviewee remarked that what KPU does is “more effective than nothing” (010), which is far from a glowing endorsement. Another indicated that “you've seen all that already in middle school, high school. Basically, [it is] very similar to what you've already seen” (011). Yet another student responded that “no, I would say no [this informal education is not an effective way of teaching pro-environmental values]. I could answer that question ‘yes’ if it were being used maybe to its full potential” (014). This interviewee also feels that it is “sad to see it [informal EE] not being taken advantage of, or being misused” (014) in the sense that consumerist behaviour is encouraged and supported on campus. In summary, most students interviewed feel there is opportunity for KPU to use informal environmental education to its fuller potential.

In their work exploring best classroom practices in informal environmental education, Walker et al (2017) establish that “Teacher modeling and implicit instruction will require minimal classroom time, and facilitate students' scientific and environmental literacy in topics such as sustainability and citizen responsibility” (abstract). One could extrapolate from this that an institution can model environmentally sustainable practices and contribute to environmental literacy in their students and even employees.

Challenges identified with pro-environmental activities on KPU campuses

Challenges were not asked for in this research; however, they inevitably arose in the conversations. They cannot be ignored in this research, and I intend to discuss them and reframe

them into opportunities for KPU to sharpen/embrace/capitalize on them for incorporating informal environmental education on all campuses. I have grouped issues identified by interviewees into categories, as well as ranked them somewhat with respect to their scope. Some issues are more easily addressed by KPU on the relatively smaller scale of a post-secondary campus, and others are broadly challenging issues which impact society as a whole.

Reducing campus solid waste (and also improving recycling and composting) and improving communication about pro-environmental actions are issues which are smaller in scope and can be more manageably addressed by KPU in comparison to the other issues identified. The need for communication about pro-environmental events, things, and systems on campus was identified as an issue by four out of 14 research participants. One student, in reference to the intercampus shuttle, mentioned that “it's not super apparent that [it is a] sustainable act” (005). This was the same student who deems many items I gave as suggestions of pro-environmental examples, such as recycling and the water bottle fill stations, as ordinary and unexceptional. This interviewee seems to be well versed in environmentally sustainable actions, to the point where they feel simple ones are commonplace and not enough. That this interviewee did not realize using the intercampus shuttle can be a green behavior illustrates that even people who are well versed in environmental issues can always learn more.

Considering most other interviewees label the simple items as pro-environmental actions on campus, I believe this one student is not the norm, and is more in tune with environmental issues than most. I agree: small green behaviors such as recycling and carrying a refillable water bottle should be commonplace; however, I fear they are not commonplace enough. In my eyes, and in the eyes of at least one participant, the fact that campus food services continue to sell

water in single-use plastic bottles is a testament to this. Anecdotally, one can peek into the recycling bins on campus and see numerous water and beverage containers, so there is space for increased personal use of re-useable water containers. Few (two out of 14) interviews in this research supported the view of unexceptional green behaviour, and so there is still opportunity for encouraging smaller green behaviours in informal environmental education at KPU and then possibly bridging those to more substantial actions and values.

Over the years, improvements have been made to KPU solid waste receptacles and their signage; however, as observed by more than one interviewee, there is still easily visible contamination in the waste streams. Comprehensive waste audits would determine which items caused users the most confusion, and then improvements can be made to educational signage and environmental communications. The community at KPU is ever-changing; new students join every four months, so the education on this solid waste system needs to be well-planned, simple, and well-supported.

A stronger commitment to zero-waste, and a step towards stronger informal environmental education, would be the return to using reusable dishes and cutlery for foodservice patrons who eat in, instead of taking their order to go. The norm at KPU has evolved to include the use of take out containers for everyone. Washable and re-useable dishes, such as ceramic plates and stainless-steel cutlery are not an option in KPU food services. Some universities even go as far as to roll out circular systems of re-useable takeout containers, with deposits, in order to eliminate single-use containers. A 2020 study conducted by Haber, Dreishpoon, and Lau at the University of Massachusetts Amherst, determined that switching away from disposable to-go containers to re-useable containers would amount to a net savings of

\$265,000 over 5 years, as well as reducing trash by 20 metric tons, and 100 metric tons of carbon emissions.

In solid waste audits of the Langley campus, conducted by ENVI 2310 Solid Waste Management classes each spring semester, disposable coffee cups are identified as a significant contributor to KPU's solid waste stream. Imagine the possibilities for demonstrating commitment to less waste, as well as influencing social norms with initiatives like this. A ten-cent discount on a hot drink is not enough of an incentive to motivate people to carry and use their own mug. What more can be done to make sustainable actions more convenient?

Or, what can change or alter our human insistence for convenience? If Indigenous worldviews, where human connection to the land and our environment are prominent, being a part of the environment instead of apart from it, were embraced, what could happen? Could this shift in worldviews allow folks to think about living with fewer resources, less 'stuff'?

Topa & Narvaez (2022) cite Jack D. Forbes as stating

"...if I lose the air I die. If I lose the sun I die. If I lose the earth I die. If I lose the plants and animals I die. All of these things are more a part of me, more essential to my every breath, than is my so called body... We are not autonomous, self-sufficient beings as European mythology teaches" (pp 470-471).

If we were to share and foster this teaching of mutual dependence on our environment, would folks be as wasteful and demanding of convenience? This is a massive shift, which will take time, but it is essential for the survival of humans on our Earth.

Somewhat difficult issues identified by participants are that:

- pro-environmental behaviour is inconvenient and students are busy;

- KPU has disjointed systems, continuity of student initiatives is a real challenge, and
- that the lack of community, or student life, contributes to the unwillingness of students to pitch in and care for the space, and possibly impacts attention to and attendance at optional educational events which are a significant part of informal education.

Without residences, KPU has what some refer to as a commuter campus culture which does not foster a sense of belonging and community in students. One interviewee noted that Kwantlen doesn't really have the same sense of community that a lot of other universities have. It's really difficult to build a sense of not only community but like ownership over your, you know, your place at the university. We really don't feel like... you don't really have that emotional attachment to it (009).

A stronger emotional attachment to a place and sense of community are thought to be motivators of caring for community and our shared environment. A research bulletin by the North American Association for Environmental Education notes “people with a strong sense of place may be more likely to engage in environmental behaviors” (Kudryavtsev & Stedman, 2012) so if KPU can foster stronger sense of place, and community, it could naturally flow to contribute to informal EE on our campuses.

This lack of community, or student life, also impacts student success and so there are projects in place at KPU which are meant to create and foster student life and community. One suggestion, from an interviewee, for improvement of pro-environmental behavior is specific to events meant to help foster a sense of belonging in new students: orientation, or welcome week.

They suggested that KPU give students less *stuff* in those bags, meaning fewer disposable items which are eventually garbage. This leads to another issue: one of busy students who may not be motivated to make time for inconvenient green behavior. Reusable items such as water bottles or coffee cups could be a valuable give-away for students, one which demonstrates that KPU students and employees are dedicated to reducing single-use food waste items.

Disjointed systems and continuity of student initiatives are themes of issues identified with pro-environmental happenings on campus. What I mean by disjointed systems is that there is no easily found central repository for environmentally sustainable events, projects, and systems. One interviewee for this research stated, “Every time I find somebody who's doing something new ... [I ask myself] why is this person not connected to anyone else” (001)? Some type of common place to house environmentally sustainable actions would also make intentional communication about these things easier.

Topa & Narvaez (2022) explain that a common dominant worldview manifestation is a focus on self and personal gain, while the corresponding common Indigenous worldview manifestation places emphasis on community welfare (pp. 78-79). This aspect of Indigenous worldviews, an emphasis on community welfare, can be a lens to think more deeply about the issue lack of community, or student life identified by interviewees, as well as a reason for creating a place for the entire KPU community to share pro-environmental information.

With respect to continuity of student initiatives, this is a challenge for many academic programs that have eager students who want to begin creative initiatives, such as activities or research which would contribute to informal EE at KPU. Students attend KPU for a set amount

of time and then graduate. There is no guarantee that new students will be motivated or choose to make the time to continue on initiatives which are started by students before them.

Some larger issues identified by student research participants are our *consumerist society*, and the *need to change social norms*. Post-secondary campuses may be able to contribute to changing social norms, over time, with more radical programs to achieve zero-waste on campus, such as a re-useable coffee cup deposit program (such as ShareWares.ca) which is a blend of convenience and eliminating single-use waste items. Our consumerist society and values are a key piece of the dominant worldviews in our society which contribute to our climate crisis (United Nations, n.d.).

Cull et.al. (n.d.) explain the holistic nature of Indigenous worldviews and how they “see the whole person (physical, emotional, spiritual, and intellectual) as interconnected to land and in relationship to others (family, communities, nations)” (Indigenous Ways of Knowing and Being).

How can educators, and KPU as a whole, communicate about environmental issues effectively to multiple worldviews? Taking time to envision the various lenses and applying those to communications is key here. Recognizing that “people with different worldviews actually construct different mental images of how climate change and the world work, climate change communicators can better craft their messages” (Kohl, 2021). Educators can touch on worldviews in their materials, where relevant, and describe how Indigenous worldviews, of living within nature and not dominating it, may be part of the many pieces which can assist with understanding and mitigating our climate catastrophe.

KPU has an opportunity to invite, share, and encourage indigenous worldviews within the KPU community. In Surrey First People’s Guide for Newcomers, Chief Harley Chappell

explains that “Indigenous worldviews are about interconnectedness and inclusion, of being part of [the bigger creation]. ... “never take more than you need” ... is a major part of our worldview. It is built on relationships and reciprocity, not extraction” (Littlecrane Consulting, 2021, p. 14). Making a connection between Indigenous worldviews and pro-environmental behaviour is easy. How this can be done on a large scale is a topic for further research and collaboration with Indigenous communities upon whose land we are guests.

Regarding ownership of land, in Surrey First People’s Guide for Newcomers, Chief Harley Chappell explains “from the Indigenous worldview, we don't own it, we can't own it, we will never own it, we're just holding on to it for future generations. The western mindset was about ownership and extraction” (Littlecrane Consulting, 2021, p 14). This connects with the human use of Earth’s resources. Everything we use is made up of materials which have been extracted from the land: trees, oil, water, soil, and so much more.

How to enhance informal environmental education at KPU... AKA recommendations

I have laid out above how interviewed students see informal EE on campus, as well as the challenges they see. I have reframed the challenges into opportunities and discussed them above. In the discussion which follows, I have grouped the opportunities into three sections with respect to scope, or level of difficulty in implementation: micro, meso, and macro.

I plan to present the results of this thesis to KPU’s Environmental Sustainability Committee (ESC), an influential audience with the President of KPU and the Executive Director of Facilities Services as co-chairs, after this thesis is complete and defended. During a previous ESC meeting there was discussion that intentional communication about KPU’s Environmentally Sustainable initiatives and successes is not well done, nor done enough. Student perspectives

within this research have confirmed this. Other pieces of this research, within all scopes of micro to macro, can provide the committee with inspiration about what can be done to improve informal EE in the KPU community.

This research has determined, in the eyes of 14 KPU students, that there are many opportunities for informal environmental education enhancements at KPU, and the needs have been categorized into six themes. As mentioned above, the themes have been further grouped into three levels of scope, or difficulty, as they apply to the difficulty of implementation at a post-secondary institution: micro, meso, and macro. Table 3 provides a summary of the opportunities to answer the perceived “needs” at each level of ascribed difficulty.

Table 3***Opportunities for improving informal environmental education at KPU***

Difficulty of Implementation	Opportunity / Need
Micro	Need for environmental communication Need to reduce campus solid waste
Meso	Need for convenient pro-environmental options Need for continuity of student initiatives and cohesive systems Need for stronger community, student life, sense of belonging
Macro	Need for changing social norms, fostering pro-environmental habits, and decreasing consumption

Each of these themes and items, as identified by student interviewees, highlight opportunities for improving informal environmental education on KPU campuses.

Micro.

Micro level difficulty of implementation, in my eyes, means less difficult with respect to human and financial resources required to investigate and plan improvements, and less difficult to change or modify systems. For example, it is easier to improve communication signage on solid waste receptacles than to determine and roll out re-useable food container systems, or to build and strengthen the sense of belonging in our student community. Environmental communication is an essential piece of all of these initiatives, if they are to be shared and be a part of informal education. Green spaces, transportation, solid waste, events, and campus operations are all within the scope of environmental communication. For examples, the more

students and faculty know about, and are aware of, green spaces, the greater the influence the spaces can have on informal EE. Hidden curriculum can be both positive and negative; intentionally promoting pro-environmental actions or unintentionally promoting the opposite. In a sense, unsustainable actions can unintentionally teach unsustainable habits and values when institutions do not place enough importance on them to do them properly. As an example: weak communication about solid waste sorting which leads to confusion and ‘wishcycling’ – are coffee cups garbage or are they recyclable? This depends on the systems in place with the contractors who collect the solid waste from each campus. Unfortunately, it may even vary from campus to campus based on the municipality.

KPU has kept, created, and maintains green space on many campuses, and it is used for many purposes, both educational and recreational, by our community. KPU has a Natural Spaces Advisory Committee (NSAC); the purpose of the committee is not found on an external facing website. As part of environmental communication, and informal environmental education, I believe all pro-environmental pieces involved in green spaces on campus, including the Natural Spaces Advisory Committee, should be highlighted and shared with our communities on campus, and perhaps off-campus too. Providing students with inviting and interesting natural outdoor spaces on campus and communicating some rationale as to why KPU does so (human health benefits, biodiversity and how it can add resilience into adapting to impacts of climate change) is important because “spending time in the outdoors opens up limitless opportunities to further one’s appreciation of nature in all its forms and can help break down the all-pervading anthropocentric culture” (Wayman, 2017, p. 174). KPU’s *xé?elł* framework, as part of *Weaving Indigenous Worldviews: Foster sense of belonging, personal growth, well-being, and*

empowerment, has directed us to “create physical and virtual spaces at each of the five campuses that reflect Indigenous peoples’ histories, contributions, languages and diversities” (KPU, 2023, p. 17). Some of these spaces can be green outdoor spaces, with communication, perhaps signage and QR codes weaving in environmental communication about pro-environmental ideas and worldviews.

Communication which includes Indigenous voices and ideas about First Nations’ relationship to the land weaving in environmental communication about pro-environmental ideas and worldviews in and around outdoor spaces, may support: “Creat[ing] physical and virtual spaces at each of the five campuses that reflect Indigenous peoples’ histories, contributions, languages and diversities” (xé?ell KPU Pathway to Systemic Transformation, p. 17). Projects with signage, events, and environmental communication in areas such as the Surrey campus forest, pond, and wild spaces near Logan Creek which borders the Langley campus could support Indigenous Environmental worldviews and potentially foster Kincentric ideas in more people who visit those spaces.

With respect to *transportation*, students and employees can be reminded about the inter-campus shuttles and how they are a green transportation option. Creating and promoting infrastructure which supports active transportation, such as cycling, can be noted in environmental communications as a support to green transportation at KPU. As students and faculty become more aware, they are more likely to choose behaviours which support environmental goals. The extent to which public messaging affects environmental behaviour choices is an area for further research.

The creation of a central online place, for advertising green *events* and happenings represents an initiative which can be achieved quickly (hence Micro). This would be a key step in fostering environmental communication at KPU. A successful online communications space would be managed as a shared responsibility for all of the green happenings, so to speak, a central place where KPU employees and students can list and share green events, programs, and systems for employees and students to review and access should they be interested. This can be a starting place for collaborations, so that environmentally sustainable efforts can be stronger working together and avoid duplication. A publicly available repository of green projects, systems, and events for review/sharing of ideas, can perhaps create synergies and strengthen informal environmental education. During my time as part of the KPU Environmental Sustainability Committee (ESC), the topic of communications has been raised. It was mentioned that communication about KPU's successes in environmental sustainability has not been happening as much as it could, or perhaps should. KPU's Environmental Sustainability Committee could discuss this topic and, if deemed a sound idea, determine resources to make it happen.

The need to reduce solid wastes on campus also falls under the theme of smaller, easier tasks for KPU. In addition to this, it can also be viewed as part of the environmental communication section above because it will take visual and written instructions to teach people what items go where in the KPU system. Many participants identified solid waste management as needing improvement, especially through the lens of what participants identified as elements of informal EE at KPU. This issue can be explored further with comprehensive solid waste audits

and may be addressed, in part, with the accessibility of reusable materials such as ceramic plates for dining on campus, and with the addition of thorough and consistent signage for waste sorting.

New students join KPU every four months, and waste management systems within our local municipalities vary. Education about KPU's on-campus solid waste system needs to be well planned, simple, and well supported in order to keep the dynamic KPU community up to date on where to dispose of what. In order to determine contamination within the waste dividing system, and also to confirm percentage of single-use beverage and food containers, audits should be conducted on each campus. Typically, an audit is conducted on the Langley campus once each year, as part of the Solid Waste Management course (ENVI 2310) taught there. Two or three students who have completed the solid waste management course could be hired by KPU Facilities to conduct multiple waste audits on all KPU campuses, as well as research ideas and solutions to improve solid waste management on campus. They could explore what creative aspects other post-secondary institutions are doing, and assess effectiveness.

One interviewee reflected on the Orientation event she attended when she first began as a student at KPU. She suggests, for new student orientation,

setting aside a block of that day... an hour or 30 minutes, for sustainability projects, ...to highlight what's already being done.... projects that are sustainability driven. So that when people come into their orientation [they learn about] things that people have been paid to do. Sustainability driven, this is what you could follow, what you can accomplish (004).

A strong and visible step towards a zero-waste campus would be adopting a system something like ShareWares, (<https://www.sharewares.ca/>). Another idea is a re-useable takeout

container system with deposits, such as the one described in the 2020 study conducted by Haber, Dreishpoon, and Lau at the University of Massachusetts Amherst. They found that using reusable to-go containers instead of disposable ones would amount to significant fiscal savings, as well as solid waste and carbon emission reductions.

Both of these actions would contribute to informal education about reducing waste, and therefore one's potential impact on the climate crisis. "When organic wastes – [such as food and paper wastes] – are disposed in landfills [instead of composted], they produce methane, a powerful greenhouse gas.... Emissions from Canadian landfills account for 23% of national methane emissions" (Government of Canada, 2022). Methane is a greenhouse gas which is "about 28 times more powerful than carbon dioxide at warming the Earth, on a 100-year timescale, and more than 80 times more powerful over 20 years" (Borunda, 2019, para. 1). The power of methane and how it contributes to our climate crisis illustrates why proper waste sorting of organics and food soiled paper waste into compost is important and an opportunity for informal environmental education.

Re-useable take out container systems are examples of providing convenient pro-environmental options to the KPU community. Simply providing ceramic and/or stainless-steel dishes for when patrons eat in is a step towards sustainability. As one interviewee pointed out, while discussing "mug share programs, dishes, [and] reusable take away containers... you're gonna [sic] have more pro-environmental behaviour if there is no bad option" (001). This example of a solid waste issue connects well to the issue of convenience in pro-environmental actions.

Meso.

One medium difficulty theme is the need for the provisioning and availability of convenient pro-environmental options. As mentioned above in the micro section, implementing convenient pro-environmental systems such as re-useable ceramic, glass, and stainless-steel dishes in food services for eating on site will reduce solid waste creation, and would also create convenient pro-environmental options. A meso step, more difficult than bringing back ceramic eat in dishes, might look like implementing a deposit system for returnable and re-useable plastic takeout containers. Part of informal environmental education could be making green options convenient, with environmental communication explanations about why they are more sustainable options. Implementing convenient green options, and communicating about them, can help to influence and/or shape social norms in our communities.

Within the realm of convenient pro-environmental options, KPU's inter-campus shuttle can be touted as a pro-environmental option for students and employees who might not realize that it is available and can save them money on gas, as well as create fewer emissions than single occupancy gas powered vehicles. The shuttle is a system already in place to assist people who take public transit with commuting between campuses, but it is not widely promoted as a green option for those who drive.

The need for continuity of student initiatives and cohesive systems was identified during the interviews. What this means is, when KPU students or faculty plan to launch projects to do with sustainability, it would be nice to have a place to go and check and see what others are doing. If a similar project has been done, there may be further opportunities to build on it. KPU is a large institution with five campuses in three cities; there is currently no mechanism for individuals to become informed of all activities, so tools to help with communication are

valuable to all. This is connected to environmental communication, identified in the Micro (level of difficulty) section above, where I suggest a central place for advertising, or listing, green events and happenings at KPU: a publicly available resource to review when planning projects or research on environmental sustainability. Other local Post-Secondary Institutions (PSIs) have comprehensive Sustainability websites which include information on plans, commitments, and research related to sustainability. I have summarized a few local PSI websites in the table below, as well as KPU's, for an overview and shallow comparison.

Table 4*Local post-secondary sustainability website headings*

PSI Sustainability website	Section Headings
UBC Sustainability	About, Teaching and Applied Learning, Research, Campus, Get Involved, News, Events
SFU Sustainability	About, Commitments & Initiatives, Sustainability Plan, News & Reports, Get Involved, Contact
RRU Climate Action & Sustainability	Climate Action Plan 2022 to 2027, Climate Leadership, Sustainability & Regeneration, Learn with us, Research highlights, UN Sustainable Development Goals, Living labs, Plans & reports, Related News
KPU Sustainability & Energy	Sustainability & Energy Home, Recycling & Composting, Environmental Sustainability Committee,

Green Tips,
Strategic Energy Management Plan,
Carbon Neutral Action Report,
Public Sector Energy Conservation Agreement,
Energy Consumption Records,
Sustainability at KPU,
Energy Dashboards,
Leadership in Energy & Environmental Design (LEED),
History,
Success Stories,
Efficiency Improvements Using Technology,
Awards,
Helpful Resources

As noted in table 4, KPU's Sustainability website highlights primarily Facilities-related activities and initiatives. A collaborative repository for KPU green projects and systems for review/sharing of ideas, can create synergies and reduce duplication of efforts. KPU's Office of Sustainability within Campus and Community Planning is working to create a Sustainability Hub which will be inclusive of all disciplines. This is an exciting development which intends to foster collaboration throughout the KPU community to "collaboratively approach sustainability challenges. The Hub is a space where members of the campus community, including faculty, staff, and students, come together to collectively advance sustainable performance at KPU through dialogue, advocacy, and action" (C. Joseph, personal communication, email October 25, 2023). So, improvements are coming, it is only a matter of time before KPU's sustainability presence on the internet becomes a significant step up from the current focus on facilities as the whole of KPU's environmental sustainability.

The need for stronger community, student life, sense of belonging could be operationalized as faculty time release for supporting student clubs and initiatives that have

environmental aspects. Educational events, such as guest speakers, film festivals, and exhibitions, which are a significant contributor to informal education, need to be promoted effectively and can be inclusive of Indigenous worldviews. This has begun to happen at KPU through our Indigenous Dialogue Series, as illustrated by the recent hosting of Robin Wall Kimmerer to discuss her book *Braiding Sweetgrass* on March 8, 2024.

(<https://youtu.be/Vx9RQKAgmp8?si=MT0sUnrSMXwGOf3y>) and other speakers too (<https://www.kpu.ca/indigenous/dialogue-series/past>).

xé?ell commits KPU to an ongoing process of systemic transformation through actions detailed in six pathways, one of which is *Weaving Indigenous Worldviews: Foster sense of belonging, personal growth, well-being, and empowerment*

(<https://www.kpu.ca/indigenous/activities>). An item within this pathway applicable to strengthening community, student life, sense of belonging and also boosting informal environmental education by applying Indigenous worldviews to assist with it is “Host welcoming events and community circles to support students sense of belonging to connect with their peers in classroom settings” (xé?ell KPU Pathway to Systemic Transformation, p. 17). Sharing Indigenous culture and worldviews on campus with KPU students and employees may help to foster stronger community and a sense of belonging. The reason for this is that

“In indigenous philosophy we are all related as individuals, as part of a kinship-based community and as part of nature in balance with the whole. In most Western thought society is seen as an aggregate of self-interested individuals connected by competition with each other over limited resources” (FirstPeoples 2013).

A portion of New Student Orientation, as one interviewee suggested, could showcase sustainable projects at KPU. Current students could contribute examples of pro-environmental behavior to events already in place (new student orientation), and this may be one way to help foster community and sense of belonging. This segues nicely into efforts to changing social norms.

Macro.

The biggest, most challenging item identified in student interviews during this research is the need for changing social norms, fostering pro-environmental habits, and decreasing consumption. Steps would need to be taken to help make the changes, and of course measurement would be necessary to determine if changes are made. Is it reasonable, logical, or overly optimistic for us to hope that implementing the easier ideas into KPU culture that we might have an impact?

Changing social norms can be defined, in some ways, as influencing worldviews. When worldviews are identified, they can be re-examined and potentially shift. When strengthening convenient pro-environmental options, and intentionally communicating about things such as the more than human values of green spaces and the many benefits of decarbonized (or less carbonized) transportation, KPU can help informally educate people. Communicators can “translate different messages into meanings consistent with how different groups think” (Kohl, 2021, para. 14) by taking various worldviews into consideration when crafting their messages about pro-environmental systems, activities, and procedures at KPU.

With the purpose of applying worldviews to informal EE, this may look like framing communication in multiple ways in order to meet people where they are at, with respect to their understanding of how climate change works and which solutions might appeal to them. Outdoor

green spaces were identified by study participants as informal EE, in the sense that caring for them and providing them for community use exhibits that green spaces are important for human health and our environment. One message/campaign could have multiple layers in order to speak to multiple worldviews.

For example, let us consider the Surrey campus “pocket forest” from various worldviews. First, the pocket forest is a natural space where most of the large well-established cedar trees were dying and have been removed because they pose significant safety concerns in a tiny urban forest. Longer periods of hot, dry weather paired with the forest being surrounded by paved surfaces, which prevent rainwater infiltration and groundwater recharging, has caused too much stress for the thirsty cedars in the small urban forest. Here I list ideas and concepts which may resonate with each worldview and can be part of one cohesive yet layered EE message about the pocket forest situation:

- Traditional: Trees were cut down due to risk of human health and safety. Weak trees pose a fall hazard. Seasonal fencing is erected to keep people (and hopefully lit cigarette butts) out due to hot dry weather increasing serious risk of fire hazard.
- Modern: New construction can incorporate green infrastructure concepts such as rain gardens which re-route rainwater draining from parking lots into garden or forested areas instead of most of that rainwater washing into sewer systems. At this point, as far as I know, this type of green infrastructure is not actually happening at KPU, but would be a fantastic opportunity for informal EE if it were. There may be other green infrastructure principles in place at KPU which could be included.

- Postmodern: Explain how [New Urbanism](#) principles can help alleviate impacts of CC by battling urban sprawl with aspects such as higher density mixed use walkable neighbourhoods, human-scaled (as opposed to vehicle-scaled) design, and preserving sustainable green spaces.
- Integrative: Space within the pocket forest could be created for reflection or meditation. Perhaps information explaining the rationale of the indigenous plants and shrubs which will be chosen, with CC resilience in mind, for restoration of the small forest would be of interest. Write about how biodiversity (supported with planting indigenous species better suited to drier urban ecosystems) can build resilience against impacts of CC.
- Indigenous: Pocket forest cedar trees which were cut down have been given to the Kwantlen Nation for use. Ask a KPU Indigenous writer in residence to compose a message about cedar trees to illustrate the importance of cedar as one of the four sacred medicines in Indigenous teachings and protocols (Gord Downie & Chanie Wenjack Fund, n.d.), and expand upon the concept of biodiversity and connection of all living beings.

The notes above are one example of how worldviews, and the diverse audience that hold them, can be taken into consideration in informal EE at KPU.

Conclusion

Key Findings

Winter & Cotton (2012) note that, in addition to academic courses, university campuses have the opportunity to facilitate learning about environmental sustainability, and that they are safe places where experiential, place-based learning about environmental sustainability can be

cultivated. According to the KPU students interviewed in this work, yes, informal environmental education can have an impact and teach pro-environmental behaviours. Overall, students do see examples of informal environmental education at KPU campuses, and most feel there is opportunity to improve on both the environmentally sustainable actions themselves, as well as their contribution to informal environmental education.

Research question(s) and address research aims

All students interviewed have witnessed examples of informal EE on KPU campuses, and also feel that improvements can be made to the systems and environmental communication in place at KPU. Examples they gave are improvements to reducing campus solid waste, environmental communication, providing convenient pro-environmental options, continuity of student initiatives, and stronger community and student sense of belonging. A larger need they identified is one of changing social norms, fostering pro-environmental habits, and decreasing consumption, and this can start with the micro and meso difficulty opportunities as outlined on pages 63-71.

Contribution to the state of knowledge and understanding about informal environmental education

With respect to contributing to the state of knowledge and understanding about informal environmental education generally, informal environmental education is an opportunity to influence people who are not already interested or motivated to act sustainably, or consider environmental impacts of their lives and actions. It can also strengthen and add to existing pro-environmental knowledge of our community. Specifically, large institutions such as KPU can, and should, lead by example as well as effectively communicate the important reasons why we

take environmentally sustainable steps. Informal environmental education can be a piece of the puzzle, or system, in influencing social norms and helping move them away from traditional Western worldviews where humans reign supreme, towards more Postmodern, Integrative, and Indigenous or Kinship worldviews where humans live in reciprocity with our planet; where humans intentionally consume less energy and resources out of appreciation and respect for our natural world.

What does this research teach us at KPU and, by extension, other universities? Three key points I want to illustrate in this conclusion are that informal environmental education is legitimate; environmental communication is a key component of making this hidden curriculum visible; and amplifying Indigenous environmental worldviews may foster transition of social norms away from materialistic social norms, encourage “enoughness,” and reduce overconsumption. In my eyes enoughness is essentially being happy with, and grateful for, what one already has, and not resorting to consumerism as a means to achieve happiness. In her 2014 TedxVailWomen Talk *Enoughness*, Cristina Mittermeier explains that the wisdom of indigenous people has shown her the importance of enoughness in relation to environmental conservation, and that shared responsibility within a community to collaborate and work together for the health and well-being of all community members builds internal satisfaction. She states that “all across the world, indigenous people and the families everywhere having this sense of connection to each other, to the environment, to ritual, that’s what gives meaning and purpose to our lives, and that’s what builds enoughness” (Mittermeier, 2014).

Informal education Studies by Barth, Godemann, Rieckmann, & Stoltenberg, 2007; Chiong et al., 2017; Winter, & Cotton, 2012 point out that hidden curriculum at universities

influences students' conceptions of sustainability. For example, electrified campus operations, pro-environmental events, and extracurricular activities can all contribute to informally educating students about environmental sustainability. Students interviewed for this research do believe that KPU, and by extension other post-secondary education institutions, have the opportunity to enhance informal learning and environmental education of their students and communities. Informal environmental education can be honed with environmental communications.

KPU students interviewed for this work identified environmental communications as an area which can be improved and applied as informal EE. Environmental communications can explicitly tell people why some steps are greener than others, and that most environmental issues have numerous variables and considerations. Environmental communications can and should be tailored based on recognizing that "people with different worldviews actually construct different mental images of how climate change and the world work" (Kohl, 2021). This leads me to discuss environmental worldviews and their importance in informal EE.

What more can be done to make sustainable actions more convenient? Can anything change or alter our human insistence for convenience and material goods? Can bolstering the voice of Indigenous environmental worldviews assist with changing social norms, encouraging enoughness, and reducing overconsumption? Human connection to the land and our environment is prominent in Indigenous worldviews; being a part of our natural environment instead of apart from it. If this holistic worldview was given a stronger voice, could this influence worldviews and encourage folks to think better about living with fewer resources, less 'stuff'? As Topa & Narvaez (2022) cite Jack D. Forbes "...if I lose the air I die. If I lose the sun I die. If I lose the

earth I die. If I lose the plants and animals I die” (pp. 470-471). KPU has committed to weaving Indigenous worldviews in order to Foster sense of belonging, personal growth, well-being, and empowerment (Kwantlen Polytechnic University, 2023, p. 17). This may also be an opportunity to share and foster this teaching of mutual dependence on our environment as a piece of informal environmental education.

Dissemination to KPU Community

In addition to interviewing students, I also became a member of KPU’s Environmental Sustainability Committee (ESC) when I began this study in order to gain insight into sustainability goals at KPU. Student perspectives will provide the committee with insight on how current systems influence informal EE in the KPU community, and may provide inspiration for improving systems and communication to encourage environmental sustainability, and therefore informal EE. I plan to present my research results to KPU’s ESC in the hopes that it can support, and build upon, the work of the committee.

Another avenue of sharing what I have learned in this process is through KPU’s Natural Spaces Advisory Committee (NSAC). I suspect they will be especially interested in student interviewees mentioning the importance and their recognition of *green space* on campus. I hope that some findings of this work can support their goals and discussions on conserving and restoring green spaces on all KPU campuses.

I met with Alicia Gowan, who is KPU’s Sustainability Specialist, Campus and Community Planning, in late August 2023. The Campus and Community Planning department is a relatively new one at KPU, and I enjoy learning more about their work, and plan to offer up

this research in order to assist them in their work. I see a strong connection between their work, or at least what I assume they do, and the application of informal environmental education at KPU.

One of the opportunities my research has identified is the creation of a central location to showcase or at least list pro-environmental projects and events at KPU. I am thrilled to report that KPU's Office of Sustainability within Campus and Community Planning is working to [establish] a cross-disciplinary Sustainability Hub (the "Hub"), as a means to bring together diverse members of the KPU community to collaboratively approach sustainability challenges. The Hub is a space where members of the campus community, including faculty, staff, and students, come together to collectively advance sustainable performance at KPU through dialogue, advocacy, and action" (C. Joseph, personal communication, email October 25, 2023).

In my role as Chair and Instructor in KPU's Environmental Protection Technology program, I have accepted an invitation to join this Hub. I plan to share my passion for informal environmental education and tell them that this Hub is actually something I have been hoping for, as well as recommending in this work.

Limitations of this study

A larger sample size could have generated more accurate results for this study; however, this is a qualitative study, and the importance of sample size is greater in quantitative studies compared to qualitative studies. Self-selection of interviewees can be considered a limitation of this study. I cannot imagine a way around such a limitation, as it was challenging enough to secure participants without an incentive for them. Reaching out to my own former students was

the most fruitful method, especially sending an email and then following it up a week or so later with a second email letting them know I still needed volunteers.

My own personal biases may have affected this research. I may have chosen to focus on the results and data that support my ideas, and pushed aside items which did not fit into the scope of this study. I did strive to engage bracketing, which is “to set aside [my] preconceptions and assumptions and approach [this study] with new, or fresh, eyes in order to grasp the uniqueness of the particular phenomenon” (Butler-Kisber, L., 2018, ch. 4). In addition to doing my best to suspend my judgement about the systems at KPU, I attempted to take all suggestions by students into consideration.

Suggested avenues for further research

One method for further exploring informal environmental education at KPU could be a survey asking students for more ideas on how to strengthen informal EE at KPU. Minimal Risk, Course-Based Research, as outlined on KPU’s research website (<https://www.kpu.ca/research/research-ethics/minimal-risk-cbra>) may also be an avenue to explore this research topic further. After survey responses are collected, focus groups, or a world café (hosting large group dialogue) may be an option to bring students and employees together to discuss, collaborate, and come up with ideas to strengthen informal EE at KPU, especially in light of survey responses. Based on my own learning and reflection in this project, it could be interesting to have research participants rank themselves on a scale of environmental savvy.

Closing remarks

Reflecting on our own worldviews, reconsidering them, and altering them to be more in line with enoughness, consuming less, and demanding less of our planet's resources for our own wealth and use are essential to address our climate crisis. In order to mitigate and adapt to the climate crisis, humans need to shift away from consumerism and towards more holistic and collectivist values. According to Topa and Narvaez, (2022) "'Indigenous worldview' does not belong to a race or group of people, but Indigenous cultures who still hold on to their traditional place-based knowledge; [they] are the wisdom keepers of this original Nature-based worldview" (p. 77). This resonates with this work I have done, and I especially appreciate the sentiment that "All people are indigenous to Earth and have the right and the responsibility to practice and teach the Indigenous worldview precepts" (p. 77). With guidance and leadership from our KPU Indigenous Advisory Committee, KPU has the opportunity to host, incorporate, and facilitate informal environmental education, with a special focus on Indigenous worldviews, on campuses and in our communities. One could even venture as far as to state that we, as an educational institution, have the responsibility to do so. Of course, this is not limited to KPU, and applies to other post-secondary institutions in the land now called Canada as well. Shifting social norms away from our anthropocentric and consumeristic values, towards holistic worldviews and sufficiency, may be the only hope we have of avoiding the approaching extinction of humankind.

References

- Abookire, S. (2020, May 29) *Can forest therapy enhance health and well-being?* Harvard Health Publishing. <https://www.health.harvard.edu/blog/can-forest-therapy-enhance-health-and-well-being-2020052919948>
- Al-Nuaimi, S. R. and Al-Ghamdi, S. G. (14 June, 2022). Sustainable consumption and education for sustainability in higher education. *Sustainability*, 14(12), 7255. <https://doi.org/10.3390/su14127255>
- Barth, M., Godemann, J., Rieckmann, M., & Stoltenberg, U. (2007). Developing key competencies for sustainable development in higher education. *International Journal of Sustainability in Higher Education*, 8(4), 416–430. <https://doi.org/10.1108/14676370710823582>
- Booth, S. (1997). On phenomenography, learning and teaching. *Higher Education Research & Development*, 16(2), 135–158. <https://doi.org/10.1080/0729436970160203>
- Borunda, A. (2019, January 23). Methane, explained. *National Geographic*. <https://www.nationalgeographic.com/environment/article/methane>
- Butler-Kisber, L. (2018). *Phenomenological inquiry*. SAGE Publications Ltd. <https://doi.org/10.4135/9781526417978>

Canada Energy Regulator. (2021, March 17). *Energy consumption and greenhouse gas (GHG) emissions*. Provincial and Territorial Energy Profiles – British Columbia.

<https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/provincial-territorial-energy-profiles/provincial-territorial-energy-profiles-british-columbia.html#:~:text=GHG%20Emissions,-B.C.'s%20GHG&text=The%20largest%20emitting%20sectors%20in,13.4%20MT%20CO2e>

Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, and Social Sciences and Humanities Research Council of Canada (2019, September 23), *TCPS 2 (2018) – Chapter 10: qualitative research 2018*.

https://ethics.gc.ca/eng/tcps2-eptc2_2018_chapter10-chapitre10.html#a

Chiong, K.S., Mohamad, Z.F. & Abdul Aziz, A.R. (2017). Factors encouraging sustainability integration into institutions of higher education. *International Journal of Environmental Science and Technology*, 14(4), 911–922. <https://doi.org/10.1007/s13762-016-1164-3>

Clements, J.M., McCright, A.M., Xiao, C. (2014). Green Christians? An empirical examination of environmental concern within the U.S. general public. *Organization & Environment*. 27(1) 85-102. <https://www.jstor.org/stable/26164700>

Coast Salish Arts & Cultural Society. (2020). *We are Kwantlen*.

Cull, I., Hancock, R.L.A., McKeown, S., Pidgeon, M., & Vedan, A. (n.d.) *Pulling together: A guide for front-line staff, student services, and advisors.*

<https://opentextbc.ca/indigenizationfrontlineworkers/>

de Witt, A. (2015). Climate change and the clash of worldviews: an exploration of how to move forward in a polarized debate. *Zygon Journal of Religion & Science*, 50(4), 906-921.

<https://doi.org/10.1111/zygo.12226>

Farrow, R., Iniesto, F. Weller, M. Pitt, R. (2020). *Research Methods Handbook*. The Open University. <https://open.library.okstate.edu/gognresearchmethods/>

First Nations Education Steering Committee (n.d.). *First people's principles of learning.*

<https://www.fnesc.ca/first-peoples-principles-of-learning/>

FirstPeoples. (2013, March). *Enoughness: restoring balance to the economy.* [Video] YouTube.

<https://youtu.be/RxPVrr44KHI>

Gord Downie & Chanie Wenjack Fund, The. (n.d.). *Anishinaabe teachings of the four sacred medicines.* <https://downiewenjack.ca/four-sacred-medicines/>

Government of Canada. (2022, September 01). *Waste and greenhouse gases: Canada's actions.*

<https://www.canada.ca/en/environment-climate-change/services/managing-reducing-waste/municipal-solid/waste-greenhouse-gases-canada-actions.html>

Haber, L., Dreishpoon, M., & Lau, W. (2020). Reusable to-go containers at UMass Amherst.

https://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1033&context=sustainableumass_studentshows

Hajar, A. (2020). Theoretical foundations of phenomenography: a critical review. *Higher*

Education Research & Development, 40(7), 1421–1436.

<https://doi.org/10.1080/07294360.2020.1833844>

Hayhoe, K. (2019). I'm a climate scientist who believes in God. Hear me out. *The New York*

Times.

<https://www.proquest.com/docview/2310741705?parentSessionId=wjYNJUFT6TJjMeGFaC3t%2FRkWY3%2BEsGSOftI4Z1vTB0%3D&pq-origsite=summon&accountid=35875>

Haynes, K., & Tanner, T. (2013). Empowering young people and strengthening resilience:

Youth-centred participatory video as a tool for climate change adaptation and disaster risk reduction. *Children's Geographies*, 13(3), 357-371.

<https://doi.org/10.1080/14733285.2013.848599>

Hedlund-de Witt, A. (2014). The integrative worldview and its potential for sustainable societies:

a qualitative exploration of the views and values of environmental leaders. [Abstract]

Worldviews, 18(3), 191–229. <http://www.jstor.org/stable/43809586>

Hess, D., & Collins, B. (2018). Climate change and higher education: Assessing factors that affect curriculum requirements. *Journal of Cleaner Production*, 170(3), 1451-1458.

<https://doi.org/10.1016/j.jclepro.2017.09.215>

Hopkinson, P., Hughes, P., & Layer, G. (2008). Sustainable graduates: linking formal, informal and campus curricula to embed education for sustainable development in the student learning experience. *Environmental Education Research*, 14(4), 435–454.

<https://doi.org/10.1080/13504620802283100>

Indigenous Foundations.arts.ubc.ca. (n.d.). *Aboriginal Fisheries in British Columbia*.

https://indigenousfoundations.arts.ubc.ca/aboriginal_fisheries_in_british_columbia/

Ives, C., Buys, C., Ogunbode, C., Palmer, M., Rose, A., & Valerio, R. (2022). Activating faith: pro-environmental responses to a Christian text on sustainability. *Sustainability Science*.

18. 10 <https://link.springer.com/article/10.1007/s11625-022-01197-w#rightslink>

Jaramillo, P., S. Kahn Ribeiro, P. Newman, S. Dhar, O.E. Diemuodeke, T. Kajino, D.S. Lee, S.B. Nugroho, X. Ou, A. Hammer Strømman, J. Whitehead, 2022: Transport. In IPCC, 2022: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change[P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA.

<https://www.ipcc.ch/report/ar6/wg3/chapter/chapter->

[10/#:~:text=Global%20transport%20was%20the%20fourth,2%20emissions%20\(IEA%202020a\).](#)

Kenton, W. (2022, December 31). *Externality: What it means in economics, with positive and negative examples*. Investopedia. <https://www.investopedia.com/terms/e/externality.asp>

Kohl, J. (2021, June 4). Talking climate with those holding different worldviews. *Yale Climate Connections*. <https://yaleclimateconnections.org/2021/06/talking-climate-with-those-holding-different-worldviews/>

Kudryavtsev, A., Stedman, R. C., & Krasny, M. E. (2012). Sense of place in environmental education. *Environmental Education Research*, 18(2), 229 - 250.

<https://naaee.org/eepro/research/library/sense-place-environmental-education>

Kwantlen Polytechnic University. (2023). *The xé?ell Pathway to Systemic Transformation Framework*.

<https://www.kpu.ca/sites/default/files/xe%E2%95%A0%C3%BC%E2%95%A9%C3%B6el%E2%95%94%C2%BC%20-%20DIGITAL-Jul.pdf>

Kwantlen Polytechnic University. (n.d.). *Indigenous participation at KPU*. Office of the Provost & Vice President, Academic. Retrieved on September 19, 2022 from

<https://www.kpu.ca/vp-academic/academic-plan-2023/indigenous-participation>

Kwantlen Polytechnic University. (2018). *Vision 2023, Draft 2: April 10, 2018*.

<http://www.kpu.ca/sites/default/files/Institutional%20Analysis%20and%20Planning/Vision%202023%20Draft%20%20April%2010%202018.pdf>

Kwantlen Polytechnic University. (2018). *KPU environmental sustainability committee*.

http://www.kpu.ca/sustainability/kpu_environmental_sustainability_committee

Kwantlen Polytechnic University. (n.d.). *KPU student profile: All students*.

<https://www.kpu.ca/sites/default/files/Institutional%20Analysis%20and%20Planning/KP>

[U%20Student%20Profile%2010112018_2.pdf](https://www.kpu.ca/sites/default/files/Institutional%20Analysis%20and%20Planning/KPU%20Student%20Profile%2010112018_2.pdf)

Leavy, P. (Ed). (2014). *The Oxford handbook of qualitative research*. Oxford University Press.

https://ezproxy.royalroads.ca/login?url=http://search.ebscohost.com.ezproxy.royalroads.ca/login.aspx?direct=true&db=nlebk&AN=779511&ebv=EB&ppid=pp_Cover_1

Liebenberg, L., Wall, D., Wood, M., & Hutt-MacLeod, D. (2019). Spaces & places:

Understanding sense of belonging and cultural engagement among Indigenous youth.

International Journal of Qualitative Methods, 18.

<https://doi.org/10.1177/1609406919840547>

Littlecrane Consulting. (2021). *The Surrey First Peoples guide for newcomers*. Surrey Local

Immigration Partnership. <https://surrey.bibliocommons.com/v2/record/S71C907032>

McGrath, C., Palmgren, P. J., & Liljedahl, M. (2018). Twelve tips for conducting qualitative

research interviews. *Medical Teacher*. 4(9), 1002-1006.

<https://doi.org/10.1080/0142159X.2018.1497149>

Merriam Webster. (2023). *Greenwashing*. <https://www.merriam->

[webster.com/dictionary/greenwashing](https://www.merriam-webster.com/dictionary/greenwashing)

Metro Vancouver. (2023). *About food scraps recycling*. Services, Solid Waste, Recycling

Programs, Food Scraps Recycling. <http://www.metrovancouver.org/services/solid-waste/recycling-programs/food-scraps-recycling/about/Pages/default.aspx>

Mittermeier, C. (2014, January 5). *Enoughness*, [video] YouTube.

<https://youtu.be/Xw8U5LXaItM?si=0KoOA8wAJKVCnqgt>

Nazir, J. (2016). Using phenomenology to conduct environmental education research:

Experience and issues research: Experience and issues. *The Journal of Environmental Education*, 47(3), 179–190. <https://doi.org/10.1080/00958964.2015.1063473>

Oblinger, D. (2006). *Learning spaces*. Educause.

<https://www.educause.edu/ir/library/pdf/PUB7102.pdf>

Oregon State University. (2010, September 14). *Snowball sampling*. Office of Research

Integrity, Human Research Protection Program and Institutional Review Board.

<https://research.oregonstate.edu/irb/policies-and-guidance-investigators/guidance/snowball-sampling>

Orgill M. (2012). Phenomenography. In: Seel N.M. (Eds.), *Encyclopedia of the Sciences of*

Learning. Springer. https://link.springer.com/referenceworkentry/10.1007%2F978-1-4419-1428-6_271

Otter.ai. (2023). *Main page*. <https://otter.ai/>

Oxford Reference. (2024). *Worldview*.

<https://www.oxfordreference.com/display/10.1093/oi/authority.20110803124830471>

United Nations. (2022, February). *Climate action fast facts. Food and agriculture*.

<https://www.un.org/en/climatechange/science/key-findings>

United Nations. (n.d.). *Consumerism and climate change: How the choices you make can help mitigate the effects of climate change*. <https://www.un.org/en/academic-impact/consumerism-and-climate-change-how-choices-you-make-can-help-mitigate-effects>

Patton, M.Q. (2002). *Qualitative research & evaluation methods*. (3rd ed). Thousand Oaks, CA: Sage.

Patton, M.Q. (2015). *Qualitative research & evaluation methods*. (4th ed). Thousand Oaks, CA: Sage.

Rice, C. (2022, May 5). *Best Laudato Si' summary*. Laudato Si' Movement, Catholics for Our Common Home. <https://laudatosimovement.org/news/whats-the-best-2-page-summary-youve-seen-of-laudato-si/#:~:text=Laudato%20Si'%20is%20an%20encyclical,%2C%E2%80%9D%20reinforces%20these%20key%20themes.>

Robinson, O. (2014). Sampling in interview-based qualitative research: A theoretical and practical guide. *Qualitative Research in Psychology*, (11)1, 25-41.

<https://doi.org/10.1080/14780887.2013.801543>

Roni, B. (2015). Now I see it, now I don't: Researcher's position and reflexivity in qualitative research. *Qualitative Research*. 15(2), 219-234.

<https://doi.org/10.1177/1468794112468475>

Schubert, C. (2008). Curriculum inquiry. In F.M. Connelly, M.F. He, & J. Phillion (Eds), *The SAGE Handbook of Curriculum and Instruction* (pp. 399–419).

<https://doi.org/10.4135/978-1-41297-657-2>

The Glossary of Education Reform (2015). *Hidden curriculum*.

<https://www.edglossary.org/hidden-curriculum/>

Topa, W. (Four Arrows), & Narvaez, D. (2022). *Restoring the kinship worldview: Indigenous voices introduce 28 precepts for rebalancing life on planet Earth*. Penguin Random House.

Trommsdorff, G., & Dasen, P. (2001). Cross-cultural Study of Education. *International Encyclopedia of the Social & Behavioral Sciences*. 3003-3007.

<https://doi.org/10.1016/B0-08-043076-7/02332-9>

Tufford, L., & Newman, P. (2012). Bracketing in qualitative research. *Qualitative Social Work*,

11(1), 80-96. <https://doi.org/10.1177/1473325010368316>

- Walker, R., Clary, R. M., & Wissehr, C. (2017) Embedding sustainability instruction across content areas: Best classroom practices from informal environmental education, *Journal of Geoscience Education*, 65(2), 185-193. <https://doi.org/10.5408/16-167.1>
- Wall Kimmerer, R. (2013). *Braiding sweetgrass: Indigenous wisdom, scientific knowledge, and the teachings of plants*. Milkweed Editions.
- Wayman, S. (2017, September 18) Fostering sustainability. In T. Jeffs, & J. Ord, *Rethinking outdoor, experiential and informal education: Beyond the confines*. (pp. 169-183). Routledge. <https://doi-org.ezproxy.kpu.ca:2443/10.4324/9781315101767>
- White, L. (1967). The historical roots of our ecologic crisis. *Science*. (155), 3767, 1203-1207. <https://www.jstor.org/stable/1720120>
- Wilson, K. & Hodgson, C. (n.d.). *Pulling together: Foundations guide*. BCcampus. <https://opentextbc.ca/indigenizationfoundations/chapter/43/>
- Wilson, S.V.J. (2014). *Circle of engagement model: A cultural guidebook to help build trust and collaborations between health planners, health trainers, health service providers, educators and First Nations*. Perinatal Services BC. First Nations Health Authority. <https://www.fnha.ca/Documents/Circle-Of-Engagement-Model.pdf>
- Winter, J., & Cotton, D. (2012). Making the hidden curriculum visible: Sustainability literacy in higher education. *Environmental Education Research* 18(6), 783-796. <https://www-tandfonline->

com.ezproxy.royalroads.ca/action/doSearch?AllField=Making+the+hidden+curriculum+visible%3A+sustainability+literacy+in+higher+education

Appendices

Appendix 1 – Request for Volunteers

Are you interested in voicing your concerns about environmental issues and sustainability? Are you a KPU student who is 18 or older? This is an invitation for you to contribute to research exploring and potentially expanding pro-environmental behaviour at KPU. This is an opportunity for students who are passionate about environmental issues to contribute their voices and ideas to environmental education at KPU.

I am a student of Royal Roads University's Master of Arts in Environmental Education and Communication program, as well as a faculty member at KPU, and I wish to explore if and how KPU informally educates its students (and community) about environmental issues and sustainability. Your participation in this study will not influence your grades or academic standing.

I will interview, by video, 8-10 students from any of KPU's 5 campuses. I will ask what you see as pro-environmental activities or communications which demonstrate or teach environmental sustainability values to our students and community. Examples of pro-environmental behaviour are: water bottle refilling stations, the intercampus shuttle, locally sourced menu options at food services, use of reusable dishes in food services, clear and well used solid waste collection system, etc.

Question: What pro-environmental, or environmentally sustainable, examples and events do you see on campus? In your eyes, is this informal education an effective way of teaching pro-environmental values? In your imaginations, what can be improved?

Appendix 2 – Questions for Participants

How do you define environmental sustainability or pro-environmental behaviour?

What pro-environmental or environmentally sustainable examples and events do you see on campus?

In your eyes, is this informal education an effective way of teaching pro-environmental values?

In your imagination, what can be improved?