

WORD UP: ALGONQUIN COLLEGE AS A SUSTAINABILITY LEADER

By

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Abstract

“Word up” is a catch phrase that denotes agreement or enthusiasm about what another has said. A question central to this thesis was whether study participants thought that Algonquin College should endeavour to be a sustainability leader. Online and clipboard surveys, involving on- and off-campus participants, compiled new ideas of how Algonquin could educate for sustainability. These ideas formed a needs analysis that, combined with a review of trends in North American colleges’ education for sustainability, fed into program design recommendations. The program design phase of the research involved participants in an assessment of the survey results and the development of program recommendations for academic development at Algonquin College. Off-campus participants suggested new types of experiential learning involving community partners and encouraged the college to educate for careers related to sustainable food and renewable energy. On-campus participants were concerned foremost with the infusion of sustainable principles across all college curricula.

Dedication

For everyone who played outside with my children
while I sat inside writing this thesis

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Chapter One: Introduction

Background

I have been afforded the opportunity to teach an online program entitled Sustainability Education at Algonquin College in Ottawa, Ontario, Canada. I have always had a passion for exposing others and myself to diverse, innovative ways to actualize sustainability. Therefore, in this thesis, I undertook to survey the Ottawa community about what should be taught at Algonquin College so that graduates are ready and willing to address sustainability in their work.

In 2007 Algonquin College became the first Canadian college to sign the Talloires Declaration (Algonquin College, 2007), an international sustainability protocol for institutions of higher learning (see the ten-point declaration in Figure 1) (University Leaders for a Sustainable Future, 2001). This is one reason that Algonquin considers itself to be a sustainability leader (Algonquin College, 2009b). The Talloires Declaration will be explored further in the literature review in Chapter Two. Algonquin College of Applied Arts and Technology, hereafter sometimes referred to as “the college” or as “Algonquin”, has three campuses with over 18,000 full-time students and 1,800 employees (Algonquin College, 2006). The college’s core values are: caring, learning, integrity, and respect (Algonquin College, 2006). Among its top ten programs, based on the number of applications, are those associated with the provision of care, health and business (Algonquin College, 2006). Also on the top ten list are the Police Foundations and Electrical Engineering programs. Algonquin’s existing environmentally-focused programs are not in the top ten and include Green Business Management, Green Architecture, and Forestry Technology.

Figure 1. The Talloires Declaration

**The Talloires Declaration
10 Point Action Plan**

We, the presidents, rectors, and vice chancellors of universities from all regions of the world are deeply concerned about the unprecedented scale and speed of environmental pollution and degradation, and the depletion of natural resources.

Local, regional, and global air and water pollution; accumulation and distribution of toxic wastes; destruction and depletion of forests, soil, and water; depletion of the ozone layer and emission of “green house” gases threaten the survival of humans and thousands of other living species, the integrity of the earth and its biodiversity, the security of nations, and the heritage of future generations. These environmental changes are caused by inequitable and unsustainable production and consumption patterns that aggravate poverty in many regions of the world.

We believe that urgent actions are needed to address these fundamental problems and reverse the trends. Stabilization of human population, adoption of environmentally sound industrial and agricultural technologies, reforestation, and ecological restoration are crucial elements in creating an equitable and sustainable future for all humankind in harmony with nature.

Universities have a major role in the education, research, policy formation, and information exchange necessary to make these goals possible. Thus, university leaders must initiate and support mobilization of internal and external resources so that their institutions respond to this urgent challenge.

We, therefore, agree to take the following actions:

- 1) Increase Awareness of Environmentally Sustainable Development**
Use every opportunity to raise public, government, industry, foundation, and university awareness by openly addressing the urgent need to move toward an environmentally sustainable future.
- 2) Create an Institutional Culture of Sustainability**
Encourage all universities to engage in education, research, policy formation, and information exchange on population, environment, and development to move toward global sustainability.
- 3) Educate for Environmentally Responsible Citizenship**
Establish programs to produce expertise in environmental management, sustainable economic development, population, and related fields to ensure that all university graduates are environmentally literate and have the awareness and understanding to be ecologically responsible citizens.
- 4) Foster Environmental Literacy For All**
Create programs to develop the capability of university faculty to teach environmental literacy to all undergraduate, graduate, and professional students.
- 5) Practice Institutional Ecology**
Set an example of environmental responsibility by establishing institutional ecology policies and practices of resource conservation, recycling, waste reduction, and environmentally sound operations.
- 6) Involve All Stakeholders**
Encourage involvement of government, foundations, and industry in supporting interdisciplinary research, education, policy formation, and information exchange in environmentally sustainable development. Expand work with community and nongovernmental organizations to assist

in finding solutions to environmental problems.

7) Collaborate for Interdisciplinary Approaches

Convene university faculty and administrators with environmental practitioners to develop interdisciplinary approaches to curricula, research initiatives, operations, and outreach activities that support an environmentally sustainable future.

8) Enhance Capacity of Primary and Secondary Schools

Establish partnerships with primary and secondary schools to help develop the capacity for interdisciplinary teaching about population, environment, and sustainable development.

9) Broaden Service and Outreach Nationally and Internationally

Work with national and international organizations to promote a worldwide university effort toward a sustainable future.

10) Maintain the Movement

Establish a Secretariat and a steering committee to continue this momentum, and to inform and support each other's efforts in carrying out this declaration.

From The Talloires Declaration by the University Leaders for a Sustainable Future, Copyright 1990. Retrieved from http://www.ulsf.org/programs_talloires.html Reprinted with permission.

Algonquin is a growing and dynamic college with three faculties: Arts, Media and Design; Health, Public Safety and Community Studies; and Technology and Trades. It also has a School of Business and a School of Hospitality and Tourism. The Centre for Continuing and Online Learning has over 36,000 registrations annually. All together Algonquin offers 155 Certificates and Diplomas, 18 Apprenticeship Programs, 16 Co-op Programs, three Collaborative Degree Programs, and three Bachelor Degree Programs (Algonquin College, 2006).

Defining Terms

“The current emphasis on sustainability, sustainable development and sustainable life support systems which recognizes the link between environmental and social equity, is leading to a shift from [environmental education] EE to education for sustainable development (ESD)” (Wals, 2010, p. 13). This is claimed to be an important shift that enables a broader, more holistic approach to fostering well-being for future generations. In 1987, sustainable development (SD) was defined in *Our Common Future* (also known as the Brundtland Report) as meeting today's needs without compromising the ability of future generations to meet their needs (International

Institute for Sustainable Development, 2011). The concept of sustainable development also stresses the need to address poverty and conduct human affairs with a mind to ecological limits (International Institute for Sustainable Development, 2011).

When viewed broadly ESD stresses the link between the environmental and the socio-cultural, between the local and the global, the past-present and future, and the human and the non-human world. Narrow interpretations tend to emphasize the environmental and ecological dimension of SD. (Wals, 2010, p. 13)

Algonquin College uses the term sustainability, and states that it must be woven into program curricula as well as the college's vision, values, and operations (Algonquin College, 2009c). I chose to use the phrase "education for sustainability" to describe curricular structures or content that purposefully address the three pillars of sustainability: ecological, economic, and social. The "three pillars" definition provides a justification for involving people in any career area with the work of sustainability; no one is seen as unaffected or outside the ambit of concerns for sustainability.

Research Problem

I perceived that maintaining momentum for continually creating and modifying programs so as to educate for sustainability was potentially a key problem for Algonquin College. Very few program descriptions mentioned sustainability and there are no incentives for new sustainability-focused programs to be created. In a report reviewing worldwide examples of progress in implementing the Talloires Declaration, Shriberg and Tallent (2003) claim that it is very challenging to "retrofit" a college's priorities, programs, and practices to address sustainability. This challenge lay at the heart of this thesis; Shriberg and Tallent's claim may also apply to Algonquin College's experience with education for sustainability.

Research Questions

1. What curriculum currently exists at Algonquin College to prepare students to support sustainability in their careers?
2. What roles do Algonquin faculty, staff, and students see Algonquin College playing now or potentially in the future regarding student preparation to support sustainability in their careers?
3. What roles do community stakeholder organizations such as *Transition Ottawa* see Algonquin College playing now or potentially in the future regarding the preparation of students to support sustainability in their careers?
4. Are there exemplary North American college curricula that are seen as models for preparing students to support sustainability in their careers?
5. Do these exemplary curricula have characteristics that might be applied as design criteria for program development by Algonquin College (either for the development of new programs/courses or the revision/evaluation of existing programs/courses)?
6. Applying the results of the preceding research questions, what design specifications can be developed to guide new curriculum development or curriculum revisions related to preparing students to support sustainability in their careers?
7. Should Algonquin strive to remain a sustainability leader?
8. Could combining skills and knowledge from diverse Algonquin program areas prepare graduates to be sustainability specialists? If so, how?

Need or Significance

This research defined by the above questions was not being done. Furthermore, Algonquin's implementation of its commitment to education for sustainability was proceeding

very slowly, with a very narrow focus, and without community input. While the college had committed to fostering environmental awareness in all students (by signing various protocols and creating visioning documents) there were few and limited structures in place to advance this agenda. Over the coming years, the routine review of curricula was to involve the insertion of sustainability-related learning outcomes in course descriptions or learning requirements. In the interim, there were no explicit forms of support or incentives for other college employees to become involved in the preparation of graduates to address sustainability in their careers. The challenge inherent in this preparation, and the importance of rising to it, were alluded to in a few college reports (Sustainability Solutions Group, 2009; Aubut et al., 2009), but there was no action plan in place to enhance Algonquin's capacity to educate for sustainability. A US study (King, 2011) found that 71% of workers value their employers' sustainability commitments and I resonate with the views of that majority, hence the personal significance of this thesis. I wanted to assist in expediting the expansion of sustainability-focused curricula at Algonquin.

Researcher's Perspective

My conception of sustainability is very holistic. I have cultivated my openness to the complex implications of any given activity on the local and global well being of human communities, ecosystems, and economies. This practice has made me keenly aware of the ethical responsibility to collectively modify behaviours so that they do not systematically discount social and ecological well being. There are values inherent in every decision we make. For instance, purchasing Coca-Cola™ is an implicit endorsement of the company's practices. In India the Coca Cola company has been accused of using scarce water resources and then selling impoverished people their own water back in the form of the popular soft drink (Brown, 2003). This product is often sweetened using high-fructose corn syrup (Consumer Reports, 2009) which

researchers found to be a much greater contributor to obesity than other sugars or fat (Parker, 2010). Corn throughout North America is genetically modified (GM) and David Suzuki, one of Canada's foremost environmental educators, claims that GM food is based on bad science (Canadian Broadcasting Corporation Digital Archives, 1999). Thus an apparently simple beverage purchase reveals a number of serious environmental and ethical issues. While our stated values may include environmental and social justice, acting on these values is complex and may demand major changes in our lifestyles and consumption patterns.

I believe that an engaged population is necessary to address and attain sustainability; thus, education for sustainability should facilitate critical thinking about what makes for engaged communities. Our governments' economic policies encourage behaviour that supports a certain economic model and this behaviour is individualistic, competitive (Jackson, 2009, p. 164), and not conducive to sustainability. Fritjof Capra, who co-founded the Center for Ecoliteracy in 1995 (Center for Ecoliteracy, 2011a), asserts that in nature there are no hierarchies, just ever-evolving networks (Capra, 1996, p. 35). Ecoliteracy is an idea that Algonquin committed to fostering when it signed the Talloires Declaration. Ecoliteracy means a re-structuring of our human communities to mimic the resilience or adaptability of ecological communities (Capra, 1996, p. 297). Part of this, in my view, is a move from competitive to collaborative thinking. I believe that education for sustainability must call into question some fundamental and faulty assumptions about prosperity. It must entail the building of a more engaged, equal, and collaborative society partially through the reappraisal of economic policies at all levels.

Concurrent with this critique of economic policy is an understanding of how current power structures in society comfortably coexist with the unsustainable status quo. Sustainability requires transcending the scrambling for dominance so there can be forms of governance in

which there is genuine collaboration between diverse groups. Only from this humbled place can humankind recognize, first, the need for profound change and, second, the myriad forms of social, economic, and political innovation that are evolving to support such change. One example of political innovation is the empowerment of marginalized groups through social media (Sedra, 2011). Also, there are examples from the world of business where collaboration is being seen as more expedient than the competitive social and economic models (Zottola, 2011) that threaten citizens' well being (Jackson, 2009, p. 154). There are many Ottawa-based sustainability-focused organizations that could engage with the college community in dialogue and in projects. An example would be the health centers working to educate low-income families about wholesome, local food amidst the fierce din of advertising from transnational junk food companies, such as Coca-Cola.

This description of my perspective reveals a passion for building sustainable food systems. I was raised on an organic farm and global food politics were routinely part of dinner conversations. As I write this, the media outlet Al Jazeera reports that 29,000 children have now died due to the famine in Somalia (Al Jazeera, 2011). To me these children are victims of colonialism and globalization; farming practices have been adapted to local landscapes over thousands of years but I believe that international interference in Africa has caused desertification and unequal access to land. The good news is that the UN is now supporting the claim that sustainable food systems require small, locally controlled farms that use as little water and as few chemical inputs as possible (Evans, 2011). In my twenty years of activism there have been positive gains such as this in the mainstream understanding of sustainability. The food issue is an ideal way to study solutions that make sense socially, politically, economically, and ecologically. International aid can be an extension of colonialism. The sustainable model in the

African case, in my view, is to empower farmers to develop their best practices collaboratively with each other, their consumers, and other stakeholders.

At age fifteen I visited the Cuernavaca Centre for Intercultural Dialogue on Development in Mexico. In addition to hearing lectures by trade unionists, feminists, and aid workers, I visited squatters' settlements and farms. From then on I was committed to studying and advocating the policies and practices that Canadians can employ to support social justice internationally. This was the subject of my undergraduate thesis. I believe that globalization should be about the spread of rights, ideas, and appropriate technology, not centralized control by a few corporations. In common with environmental educators such as David Orr (2004, p. 168) I believe that centralized control (lack of diversity) is antithetical to sustainability. My passions are engaging people with local well being and not involuntarily contributing to oppression through thoughtless consumption. I know I am part of a large movement because colleges and universities across the continent are banning sales of Coca-Cola (Rothstein, 2005). I can envision college students everywhere growing, processing, and marketing their own local specialty beverages.

Chapter Two: Literature Review

Understanding Unsustainability

Algonquin College has signed national and international protocols declaring their commitment to education for sustainability. It is my contention that education for sustainability is most powerful if it holistically redresses unsustainability. In 2009, an Algonquin College white paper on sustainability stated, “if we are to be a leader amongst Canadian colleges, we must undergo a paradigm shift in our culture, attitudes and behaviours” (Aubut et al., 2009, p. 2). Therefore prospects for such a shift will briefly be examined in this review by discussing the roles of culture and values in sustainability dialogue. Veteran environmental educators are bringing forward critiques of their own practices and acknowledging the forces that are maintaining the status quo and that prevent people and institutions from adopting “pro-environmental behaviour” (Wals, 2010, p.21). It is critical to understand the barriers to a respectful engagement with the natural world (including its human communities). The following writers and scholars have offered insightful interpretations of the root causes of unsustainability and why they present such a formidable challenge.

The pedagogy of David Orr.

David Orr is an American writer and professor who challenges the idea that education is good in and of itself. In a 1990 commencement address entitled “What is Education For?” he reminded his audience that the best-educated people on earth created the Holocaust and that those with MBAs and PhDs have created the current environmental catastrophe (Orr, 1991). Higher education does not necessarily equip students to create, or even participate in, a just and sustainable world. Orr is at the forefront of a movement to question the values embedded in education and to reorient higher education so that graduates have the consciousness to participate

personally and professionally in the meeting of sustainability targets. He makes the bold statement that all education should be environmental education (Orr, 2004, p. 12). Currently we are taught each subject as if it exists in a vacuum. Orr claims that it is critical for human survival that we re-learn the hard fact that every human activity has a reciprocal relationship with the environment in which it takes place. Sustainability dialogue also challenges us to look at connections between subjects and to teach students to seek connections between, for example, health and economics, media and crime, or agriculture and politics.

This holistic understanding is not foundational in our current education system. Orr proposes that three philosophers' ideas about reality have disrupted humanity's chances of living in harmony with each other and within the natural world.

Historically, Francis Bacon's proposed union between knowledge and power foreshadows the contemporary alliance between government, business, and knowledge that has wrought so much mischief. Galileo's separation of the intellect foreshadows the dominance of the analytical mind over that part given to creativity, humor, and wholeness. And in Descartes' epistemology, one finds the roots of the radical separation of self and object. Together these three laid the foundations for modern education, foundations now enshrined in myths we have come to accept without question. (Orr, 2004, p. 8)

Orr implies that these myths of separateness and hierarchy have created monsters in the form of legions of educated people who are unaware of how they, and their activities, fit in their environments. Six of the myths proposed by Orr are described in greater detail below.

The first myth is that ignorance is solvable. This presumes that it is possible to understand an infinitely complex universe. Instead it now seems appropriate to admit that we

cannot completely know exactly how our actions affect other life and this leads to the second myth, which is that we can manage the natural world. The more realistic plan, Orr asserts, is to learn to live harmoniously with the natural world; Orr suggests we learn to manage ourselves, as it is our fear (of scarcity) and desire (for excess) that prompt war and environmental devastation. The third myth is that “goodness” expands with knowledge. We need to start communicating about values and ethics because they do not come hand in hand with information.

Descartes asserted that the whole was no more than its parts so education has been about studying parts. Accordingly, the fourth myth is that we can restore what we have dismantled, be it cultures, forests, or topsoil. These things are not just a collection of parts, however, they are systems. Systems have their own order and the way the parts interact teaches us about collaboration and continual adaptation to changing circumstances. The fifth myth is that material success is an important goal of education. “Materialistic values such as popularity, image and financial success are psychologically opposed to ‘intrinsic’ values like self-acceptance, affiliation, a sense of belonging in the community” (Jackson, 2009, p. 148). Orr states that the world does not need more successful people, but rather more humble, creative, and caring people (2004, p. 12). Lastly, there is a myth that western culture is the pinnacle of human achievement. Given that getting here meant the ruination of other cultures, other types of knowledge, and a sense of belonging in the environment (not to mention the environment itself) it seems appropriate to broaden our ideas of prosperity and of what should be respected, beginning in our educational institutions.

Algonquin has *respect* as one of its four core values but our society has a narrow idea of who and what to respect. Very few people have been taught to respect everything that supports their existence, including not just individuals but also systems. Ignoring our relationships with

the environment has proved to be very unhealthy and utterly unsustainable. If all education were to be sustainability education, then students' eyes would be opened to what is known and unknown about how to flourish along with their natural and human communities. This civic engagement is pivotal too. In a visionary book about actualizing sustainability, Tim Jackson (2009) states that "beyond mere subsistence, prosperity hangs crucially on our ability to participate meaningfully in the life of society" (Jackson, 2009, p. 143). Once basic needs are met, it is this participation that enriches our lives, not material things. It is imperative that sustainability dialogue addresses the flawed logic maintaining consumer society and contributing to the "social recession" (Jackson, 2009, p. 144).

The dominance of consumerist values.

Before moving into a discussion of promising strategies in education for sustainability, this review of the literature will review the works of several authors who have written about contemporary values and sustainability. Funkhouser (1989) contends that values changes are necessary to actualize sustainability. He explains how consumerist values were promoted for economic purposes. The chosen path to economic recovery after the two world wars was employment via industrialization. Various mechanisms, such as public relations and advertising, began promoting increased consumption and soon consumption was felt to be a civic duty. "It appears that our modern, so-called liberal values favor and support our present, consumption-oriented social order. These same values undermine and override the more traditional values necessary for sustainability, in ways that many may not realize" (Funkhouser, 1989, p. 19). The traditional value of "do unto others", for instance, is overridden when the "others" are far away in fields or factories producing our luxury items.

Funkhouser points out the patchwork of values in America and the difference between the “official values” by which one claims to live and “operative values” which reveal themselves in actual choices made:

Reviewing the pattern that values changes have followed, it seems that “official values” have moved steadily over the past three centuries toward the “operative values” by which people from the times of the ancient Hebrews have always yearned to be guided -- be free of authority and have a good time. (Funkhouser, 1989, p. 27)

In discussing values, this trend must be acknowledged; rather than battling for justice, people are inclined to simply enjoy whatever sweetness life has afforded them. However, Jackson states that a range of values has supported human evolution: “Both individualism and the pursuit of novelty have played an adaptive role in our common survival. But so have altruism and conservation or tradition” (Jackson, 2009, p. 163). Discussing and balancing values becomes the important task.

The balance to be struck between freedom and responsibility is something little discussed in secular education.

The current system is driven by the systematic cultivation of greed and envy, the very forces which drive men into conflict... The cultivation and expansion of needs is the antithesis of wisdom. It also is the antithesis of freedom and peace... In a sense the market place is the institutionalization of individuality and non-responsibility. Neither buyer nor seller is responsible for anything but himself. (Schumacher, cited in Funkhouser, 1989, p. 27)

This is one of many justifications for the consideration of new economic models; unsustainable patterns of production and consumption are entrenched almost beyond our ability to recognize

and question them. Jackson explains how the “social structure provides perverse incentives in favour of a materialistic individualism and undermines the potential for a shared prosperity” (Jackson, 2009, p. 160). Institutions of higher learning are ideal places for sustainable economic models and social structures to be designed and discussed.

Blohdorn (2002) has also offered explanations of how our values have enabled unsustainability to dominate our patterns of behaviour. He begins his explanation of unsustainability in the post-war era of the 1950s when modernists prized security and autonomy, primarily in material ways, and thought these goals “to be most achievable if pursued collectively and for society as a whole rather than competitively and for particular individuals” (Blohdorn, 2002, p. 3). As material security became the norm, post-materialism spawned social movements or silent revolutions, such as the environmental movement of the 1970s. Security and autonomy came to be considered in cultural or philosophical terms instead of material ones, but accompanying this was a focus on the individual; this was a post-materialist era but one where individuality and self-expression gained momentum (Blohdorn, 2002, p. 3).

Following the silent revolution of the 1970s was a silent counter-revolution that began in the 1980s and was exemplified by the neo-materialism of late-modern societies (Blohdorn, 2002, p. 3). Blohdorn claims that there has been a quiet backlash against the idealism of the first social and environmental justice movements. After the cold war, the “risk society” was replaced by the “opportunity society” wherein there are exclusive privileges. Just as material security was taken for granted earlier, eventually individual autonomy was taken for granted as well. Blohdorn identifies a post-ecologist mindstate that causes constraints on individuals’ fulfillment to be systematically dismantled (Blohdorn, 2002, p. 3). Compounding this, Blohdorn suggests, the

current economic, political, and ecological uncertainties perpetuate neo-materialist, individualistic and exclusive values:

The hypothesis is that the contemporary frame of mind has no genuine appreciation for the ecologist goals of social justice and ecological integrity, and that the discourse of sustainability may have to be interpreted as a strategy to disguise an unsustainability late modern societies neither can, nor really want to, remove. (Blohdorn, 2002, p.2)

It is critical to address neo-materialist, individualistic, and exclusive values in the policies and practices of our society. It is also important to address the fact that people may interpret sustainability as threatening their quality of life when it could in fact enrich it.

Proponents of sustainability such as Rob Hopkins, co-founder of the Transition Movement, emphasize the need to paint an appealing picture of a sustainable future as opposed to focusing on the unfortunate repercussions of unsustainable behaviour. Yet,

...the prevailing approach is still simply to flood the public with as much sound data as possible on the assumption that the truth is bound, eventually, to drown out its competitors. If, however, the truth carries implications that threaten people's cultural values, then [confronting them with this data] is likely to harden their resistance and increase their willingness to support alternative arguments, no matter how lacking in evidence. (Kahan, 2010, p. 297)

Kahan proposes that if people feel their lifestyles are threatened they will not be receptive to becoming involved with sustainability initiatives. Therefore, sustainability education would do well to highlight Jackson's research, showing how

a less materialistic society will be a happier one. A more equal society will be a less anxious one. Greater attention to community and to participation in the life of society

will reduce the loneliness and anomie that has undermined well-being in the modern economy. (Jackson, 2009, p. 156)

This reference to widespread loneliness suggests that the participatory nature of sustainability could be an antidote to social ills.

The myth of independence.

An ecoliterate person understands that the web of life supports her; she knows that she is dependent on nature and has roles in many natural and human-created systems. However, the marketing messages that work fervently to create economic growth often capitalize on people valuing “freedom” from responsibility. As Funkhouser and Blohdorn have shown, such emotional constructs as these have changed over the years. “Freedom” used to imply living in a community that was not under enemy siege. Now car commercials create associations with freedom by driving an SUV on the moon or through an untouched rainforest. A powerful part of education for sustainability entails discussing research showing that on a deeper level people are nurtured by connection and not consumption. “Consuming less, voluntarily, can improve subjective well-being- completely contrary to the conventional model” (Jackson, 2009, p. 151). Freedom from reciprocal relationships is not gratifying. However for those unaccustomed to civic engagement, plugging into sustainability projects may seem daunting.

Currently there is a perception that the work of actualizing sustainability only involves certain types of people. Conversely those in this line of work tend to make their beliefs about sustainability a part of their identities, personally, professionally, and socially. If sustainability is not part of the usual dialogue in one’s home or work, it may be unlikely for one to become involved with sustainability. “The way that people think- including their response to factual information- tends to work to protect their current identity” (Crompton, 2010, p. 19). On a

college campus there is already a sense of group identity so giving sustainability visibility and making it part of, for example, Algonquin's culture, would be a powerful way to create demand for education regarding sustainability.

Crompton says that in "high-stakes, emotion-laden political situations" such as those surrounding current environmental and social crises, "people's grasp of the facts is not irrelevant, but their feelings are more important in shaping their judgments" (2010, p. 19). Ecopsychology is a profound tool to create feelings of connection and shared purpose when a group of people discusses sustainability (International Community for Ecopsychology, 2004). A central premise in this field is that there are intense, latent emotions that people carry due to knowingly participating in unsustainable behaviour. When this is aired, people can experience grief instead of guilt. There can also be an accompanying discussion of what one loves and appreciates about nature and the living systems of which one is a part. Then action can be taken from a place of gratitude instead of fear or shame. Creating emotional buy-in for sustainability can be powerfully motivating. Dialogue should illustrate how participating in sustainability efforts can be rewarding on many levels.

Case study: Transition towns.

Framing education for sustainability as requiring a fundamental shift in attitudes and behaviours may make the endeavour seem ambitious. The following example of informal education for sustainability highlights how communities actually can transform themselves to become sustainable. Rob Hopkins (2009) recently completed his PhD dissertation on the Transition initiative that he co-founded. The fundamental premise of Transition is that out of necessity, at the community level, we must determine how we can thrive with less energy and no fossil fuels. Hopkins conceived of Transition towns while teaching permaculture in Ireland.

Permaculture is a holistic way of designing communities such that they are self-reliant in terms of energy, building materials, food, and fun (Permaculture Institute, 2011). It takes different shapes in different places based on local resources and culture. The cultural piece is fundamental; permaculture implies a culture that lasts because it is resilient.

Hopkins moved back to his native Totnes, England and established a collective to work on local self-reliance and in 2006 the first Transition town was born. Apparently there is a hunger for hands-on approaches to addressing sustainability; inspiration spread virally and there are now 836 Transition initiatives worldwide (Transition Network, 2011). As Algonquin College is in the unique position of having two campuses located in Transition towns (Ottawa and Perth), the off-campus data collection in the research for this thesis included members of Transition Ottawa. While each Transition initiative chooses distinct projects, all are concretely addressing the need to reduce dependency on fossil fuels and energy. All initiatives begin with an “unleashing” event (community party) and continually draw people into the fun of creating of resilient communities.

The resilience construct is favoured over the sustainability construct in Transition culture: The concept of resilience emerged from within the ecological sciences as a way of looking at why some systems collapse when they encounter shock, and some don't. The insights gleaned now offer a very useful overview for determining how systems can adapt and thrive in changing circumstances. Resilience within communities, for example, depends upon:

- diversity, a broader base of livelihoods, land use, enterprise and energy systems than at present

-modularity, not advocating self-sufficiency, but rather an increased self-reliance with ‘surge protectors’ for the local economy, such as local food production and decentralised energy systems and

-tightness of feedbacks, bringing the results of our actions closer to home, so that we cannot ignore them. (Hopkins, 2009, p. 13)

I contest that a focus on concrete local action and celebration of local culture make the Transition approach more tangible and engaging than other forms of education for sustainability. Transition initiatives also use systems thinking so networks replace hierarchies and cycles replace linearity (Center for Ecoliteracy, 2011b).

A “Transition trainer” who has helped found a dozen Transition initiatives in the United States (US) gives the following explanations for the popularity of the movement. She says that people of all political persuasions agree on the problem of rising oil prices and the need for community action. This critical ability of a group to form and act despite members’ differing value systems is akin to what is called value pluralism in the field of environmental ethics (Marietta, 1993, p. 69).

We get conservatives who remember how it used to be when neighborhoods and community had a stronger sense of familiarity, community, and mutual support, and we get hippies who have always dreamed of a stronger sense of community... We get all kinds of people interested in local foods and local economic resilience for themselves and their families... The [Transition] model is a wonderful model for bringing people together because it starts with relationship-building... It starts with including everyone in the conversation and inviting everyone to a huge party. (Clarke, as cited in Burton, 2010)

A tangible result of Transition initiatives in Boulder County, Colorado is that there are now 80 restaurants serving local food, whereas in 2006 there were only seven (Burton, 2010). This shift is portentous for local jobs and health while reducing carbon emissions.

Institutions of Higher Learning and Sustainability

Sustainability protocols.

Institutions of higher learning potentially have unique leverage to create sustainable communities. These institutions shape society through their many roles such as conducting research, training workers, and modeling values. In recognizing this fact, a movement is growing to use colleges and universities as places to innovate, dialogue, and advocate for sustainability. What follows is a snapshot of relevant sustainability protocols ranging from one that is international in scope to those created by and for the local school that is the focus of this study, Algonquin College.

The Talloires Declaration was created in 1990 by the *University Leaders for a Sustainable Future* (ULSF) (University Leaders for a Sustainable Future, 2008). The declaration is a comprehensive commitment, made by colleges and universities, to advancing the sustainability agenda. As of January 2008 it had been signed by representatives from 360 institutions of higher learning from all over the world (University Leaders for a Sustainable Future, 2008). The original declaration did not mention all three pillars of sustainability; they were little discussed in that era. The Talloires Declaration is very environmentally focused though it does make multiple references to requisite accompanying social phenomena such as networking, dialogue, cultural shifts, and interdisciplinary collaboration. It is noteworthy that the press release accompanying Algonquin's signing of the Talloires Declaration referred to it as an "energy conservation agreement" (Algonquin College, 2007) when it does not even mention

energy. Subsequent sustainability initiatives at the college reveal that the administration has developed a broader understanding of the implications of Talloires.

In North America, education for sustainability has an exuberant champion in the form of the Association for the Advancement of Sustainability in Higher Education (AASHE). This organization is a clearinghouse for information about sustainability initiatives underway, primarily in the United States but also at colleges and universities worldwide. AASHE's weekly newsletter is bursting with good news from the front lines of education for sustainability. Their website, www.aashe.org, helps institutions of higher learning to share information about how to plan, fund, and execute all types of sustainability initiatives. AASHE also provides inventories of, for example, institutions that are using renewable energy, researching renewable energy, or teaching sustainable agriculture.

AASHE is also a parent organization for other projects such as the Sustainability Tracking, Assessment, and Rating System (STARS) whereby colleges and universities can see how they measure up and determine where they could be stronger in addressing sustainability. The three main areas for assessment are curriculum, operations and administration with bonus points awarded for innovation. This thesis is concerned with curriculum so the following comments describe how curriculum is evaluated by STARS. Three categories each allow schools to gain up to ten points: sustainability-focused courses, sustainability-related courses, and sustainability learning outcomes. They can get up to seven points for sustainability courses by department and up to four points for either undergraduate or graduate programs in sustainability. They can get up to three points for sustainability course identification or incentives for developing sustainability courses. Up to two points are awarded for sustainability immersive experiences or sustainability literacy assessments. Also in the curriculum category,

there are five categories for research totaling to a possible 27 points, and twelve categories for co-curricular education to a possible 18 points. An interesting feature of STARS is that an institution need not publish any of its information and can simply participate as a “reporter”, thereby steadily learning about how it could address sustainability in the future.

The Association of Canadian Community Colleges (ACCC) began drafting a Sustainability Protocol in 2007 and Algonquin College became a signatory on April 22, 2009 (Algonquin College, 2009a). By signing this protocol (see Figure 3) member institutions pledge to embed sustainability across the curriculum, use sustainability as a guiding principle in institutional planning, and have a plan in place to evaluate progress towards these goals (Association of Canadian Community Colleges, 2010). It also alludes to making ever more community connections to support greater innovation, awareness, and adoption of sustainable practices. The importance of interdisciplinary cooperation is also emphasized. Many sustainability achievements of the signatories to this protocol will be mentioned in this thesis but the British Columbia Institute of Technology deserves special mention. While the institute has had great success infusing sustainability into its philosophy, operations, and curriculum an especially noteworthy accomplishment is its provision of sustainability-related professional development opportunities for faculty:

Over the two day workshop, participants addressed a number of challenges and opportunities as well as brainstormed about what evidence would demonstrate that students had learned about sustainability and were empowered to become effective leaders in their communities and practitioners within their fields. (British Columbia Institute of Technology, n.d.)

This event will hopefully inspire other Canadian institutions of higher learning. If sustainability protocols commit faculty to providing education for sustainability, the institutions must first educate the faculty.

Figure 3. The ACCC Pan-Canadian Protocol for Sustainability

Association of Canadian Community Colleges

PAN-CANADIAN PROTOCOL FOR SUSTAINABILITY

The signatory institutions to this protocol agree to maximize their contribution to a sustainable future and are committed to their role as leaders to their internal and external communities.

In the context of this protocol, sustainability is institutionally defined and may include environmental, economic and social dimensions.

The signatory institution agrees to undertake the following:

- establish a sustainability policy;
- incorporate the principles and best practices of sustainability in corporate documents and reports such as mission statements, strategic plans, annual reports, and policies;
- develop an institutional sustainability plan that includes mechanisms for tracking progress;
- integrate the principles of sustainability within curriculum to enable students and communities to develop competencies and commitment to contribute to a sustainable future;
- incorporate sustainability practices in procedures and operations such as green standards for buildings, alternate energy sources, Energy Star certification for products, and energy efficient transportation;
- integrate sustainability principles in cultural, sports, recreational and other activities;
- participate in sustainability networks and consortia, sharing exemplary practices, research, and models; and,
- work collaboratively with government, business and the community to develop and implement joint strategies to move society toward sustainability.

From ACCC Pan-Canadian Protocol for Sustainability by Association of Canadian Community Colleges, Copyright 2009. Retrieved from <http://www.accc.ca/english/advocacy/sustainability.htm>. Reprinted with permission.

There is abundant support for institutions delivering education for sustainability. There is even a community of practice that is uniquely Ontarian. Colleges Ontario published a report in

2010 entitled “Colleges Driving a Sustainable Future: New Careers for a Clean Economy” (Colleges Ontario, 2010). The following are excerpts from the introduction to the report.

Ontario colleges are at the forefront of the green economy and are integral to its success... The public colleges are uniquely positioned to work within their communities, building regional partnerships with business, industry and environmental groups, and creating the framework for new and expanded pathways to green careers... Ontario colleges are leaders in the shift towards a culture of sustainability, which requires the rapid introduction and expansion of new green technologies and behaviours across Ontario- in classrooms, workplaces, facilities and homes throughout the province. (Colleges Ontario, 2010, p. 4)

The enthusiastic tone of this report is inspiring and it refers to many themes that will resurface throughout this thesis such as collaborating with community partners.

Sustainability strategies produced for Algonquin.

To operationalize the goals in the two sustainability protocols that it has signed Algonquin College has created the Sustainable Algonquin Steering Committee (SASC).

The Committee is charged with bringing focus and order to the College as it fulfills its commitment to the Talloires Declaration. As a steering committee guiding the College’s sustainability agenda, the Committee should build consensus through awareness and understanding, motivate change and action, advance our ability to make a difference and reinforce our successes related to environmental stewardship. (Algonquin College, 2010c)

SASC hired the Sustainability Solutions Group, www.sustainabilitysolutions.ca, in 2009 to create a best practices report. Also in 2009, SASC members helped to produce a sustainability

white paper (Aubut et al., 2009) to accompany the new iteration of the college strategic plan. The recommendations of each of these will be briefly examined. In 2010, a document was produced entitled “Embracing Change Ready to Act: The Strategic Programs & Services Planning Project Final Report” and its focus was an assessment of the economic sustainability of each program offered by Algonquin (Algonquin College, 2010b).

The Sustainability Solutions Group was contracted to create the “Algonquin College Sustainability Assessment Best Practices Study: Educational Institutional Sustainability” hereafter called the best practices report. The purposes of the study were to:

- Identify trends most influencing the implementation of sustainability at institutions of higher education, industry and in other areas.
- Survey best practices in industry and institutions of higher education that can accelerate progress in all College areas.
- Explore the benefits and challenges of different institutional structures for sustainability coordinators and offices.
- Suggest best-in-class resources, conferences, partnerships and associations that can assist in accelerating and maintaining a leading position in sustainability.
- Recommend advantages, risks and priorities for various best practices to most advantageously position the College. (Sustainability Solutions Group, 2009, p. 1)

While most of the report dealt with campus operations and the college’s administration the following suggestions outline various approaches to education for sustainability.

- Provide courses and programs of direct relevance to sustainable development.
- Encourage the systemic adoption of sustainability throughout traditional subjects.

- Establish research and/or teaching centres that focus on sustainability... [recognizing] the cross-cutting and interdisciplinary nature of sustainability, and [providing] opportunities for synergies between traditionally separate subjects.
- Offer academic credits for participation in sustainability initiatives...
- Offer sustainability-focused co-op programs. (Sustainability Solutions Group, 2009, p. 20)

The study also suggests that sustainability shape the mode of delivery and that students be involved in educational design. These are seen as means of embedding a sustainable philosophy into college curricula. The best practices report was created without widespread input from college stakeholders and was not widely shared once completed. Overall, this document gives a clear though very brief account of how Algonquin could approach education for sustainability.

The white paper on sustainability was one of ten similar papers produced to accompany Algonquin's five-year Strategic Plan. The ten topics were chosen because they were felt to address major changes in society that needed to be reflected in Algonquin's curricula and operations. "Students today are expecting a commitment to green initiatives and beginning to demand green campuses. If we are to be a leader amongst Canadian colleges, we must undergo a paradigm shift in our culture, attitudes and behaviours" (Aubut et al., 2009, p. 1). This excerpt from the sustainability white paper executive summary is very bold and ambitious as are the specific academic curriculum integration recommendations in the report:

- Revise the College's Vision and Mission statements, and core values to reflect sustainability embedment within The Algonquin Experience.

- Develop and implement a formal change management strategy to drive a cultural shift in behaviours, values and attitudes towards sustainability - staff and students have an opportunity to sign a Sustainability Commitment Pledge.
- Educate staff and students and embed sustainability throughout curricula using the proposed mixed option.
- Provide community outreach experiences (field, clinical, co-op) to participate in sustainability practices.
- Establish experiential learning opportunities for program students to assist in operational sustainability practices, i.e. Horticulture students working with Hospitality/Cafeteria Services on a red worm composting initiative.
- Modify the Professor of the 21st Century document to reflect knowledge and skills in sustainability practices.
- Engage faculty and students in applied research studies to advance sustainability initiatives.
- Brand and market the competitive advantage of The Algonquin Experience in preparing sustainability leaders for global careers.
- Establish a cluster of sustainability or green programs. (Aubut et al., 2009, p. 10)

These are exceptionally commendable ideas, and if operationalized, they would ensure Algonquin remained the sustainability leader it claimed to be in 2009 (Algonquin College, 2009b).

Challenges in implementing sustainability protocols.

While the dialogue that resulted from these two above-described reports was very promising, it has not spread throughout the college or resulted in much activity. The specific

challenges inherent in education for sustainability will be discussed at length later but there is another phenomenon at play here as well. Organizations cannot stay the same; they must learn and change. This insight and the practical advice that accompanies it derive from the work of Peter Senge, who was named Strategist of the Century by the Journal of Business Strategy (Smith, 2001). Using systems thinking, Peter Senge has pioneered the idea of the learning organization because “in situations of rapid change only those that are flexible, adaptive and productive will excel. For this to happen, it is argued, organizations need to ‘discover how to tap people’s commitment and capacity to learn at all levels’” (Smith, 2001). This thesis will return to a discussion of the critical importance of employee support for the organization’s vision (of, in this case, sustainability). What follows is an explanation of the fact that Algonquin is not alone in experiencing challenges as it attempts to implement sustainability protocols.

In 2003, the ULSF published an analysis of the experiences of institutions of higher learning entitled *Beyond Principles: Implementing the Talloires Declaration*. One of the main challenges identified was creating buy-in at the level where influential changes can be made.

Commitment from stakeholders is more problematic at higher levels in the institutional hierarchy, with means arranged in the following decreasing order (Governing Board – Administrators – President – Staff – Faculty – Students). Lack of commitment from students and faculty as well as “fear of change” and lack of commitment from staff are the least formidable barriers to sustainability-leadership. (Shriberg & Tallent, 2003, p. 3)

Therefore, according to this report, it is the powerful few who must be on side. When presidents and vice-presidents of institutions of higher learning perceive the opportunities inherent in the implementation of sustainability, and if they can envision sustainability efficiently bettering their colleges, then they choose to make the resources available for others to actualize the vision.

If there is not buy-in at the senior level for exploiting the opportunities inherent in implementing sustainability, then there may still be a certain amount of lip service paid. *Beyond Principles* showed that many institutions were eager to incorporate sustainability into their image and branding strategies (Shriberg & Tallent, 2003, p. 3). Algonquin College hosts a Sustainability Speakers' Series (Algonquin College, 2010a) and facilitates the See Earth program, an annual international extra-curricular excursion abroad for interested staff, students, and faculty to learn about sustainability (Algonquin College, 2008a). The college president considers Algonquin to be a sustainability leader due to its signing of Talloires and its implementation of energy-saving (cost-saving) measures (Algonquin College, 2009b). These accomplishments represent feel-good talking points; however, they do little to create a cultural shift or expand the college's capacity to educate for sustainability.

Algonquin is not unique in its stalled commitment to ensuring all students are learning about sustainability. In another report Shriberg (2002) states,

competing institutional priorities and lack of integration across functional areas are major barriers to TD [Talloires Declaration] implementation... Most institutions have pockets of environmental activities, but little or no coordination, leadership or major actions, and have yet to address the deep questions of sustainability. (2002)

Beyond Principles suggests many ways to address the systemic barriers to Talloires implementation. Colleges are advised to continually explore the economic opportunities related to the implementation of sustainability. Also, Shriberg and Tallent (2003) claim that it is critical to overcome the systematic discouragement of departments cooperating. Finally, the researchers advise colleges to develop a detailed sustainability implementation plan, allocate responsibility for this plan, and plan for its evaluation (Shriberg & Tallent, 2003).

These suggestions imply that an organizational culture of collaboration is necessary for sustainability, requiring a cultural shift affecting even the institutional structure. *Beyond Principles* states, “bureaucratic and hierarchical structures tend to discourage progress on sustainability” (Shriberg & Tallent, 2003, p. 3). Sustainable colleges and universities invite participation in sustainability initiatives by stakeholders on and off campus and support the ideas that organically arise from these community members. Formal means are developed for collaboration between departments so that the college can experience the interdisciplinary nature of the implementation of sustainability. These collaborations also help to illustrate how social, economic, and ecological well-being are connected. Students, staff, and faculty can all have the empowering experience of both teaching and learning with the goal of improving the college and the broader community.

Georgian College in Ontario made the list of Canada’s greenest employers for two consecutive years (Georgian College, 2011). At the ACCC annual conference there was a workshop advertised as follows:

Learn about how Georgian has begun its cultural shift by fostering sustainability on campus and within the college community. Follow the journey that this post-secondary institution has taken to become more sustainable while being fiscally responsible.

Highlights will include initiatives relating to:

- * institutional commitment
- * staff/student awareness and engagement
- * environmental literacy
- * administrative and physical operations
- * community partnerships. (Cvent Event, Survey & eMarketing Solutions, 2011)

Fleming College is another Ontario college that calls itself a sustainability leader. A document titled “Fleming College and Sustainability Partnerships” states that the college’s top two partners are its students and its community partners (O’Connor & Schemmer, 2010, p. 8). The message is not about the college itself excelling in the implementation of sustainability, but rather the college fostering communities of practice around the implementation of sustainability.

Even just the dialogue aspect of the participatory approach is powerful. *Beyond Principles* states that only 25% of research respondents knew that their university or college had signed the Talloires Declaration (Shriberg & Tallent, 2003, p. 4). This is also a challenge faced by Algonquin College. A related issue is that SASC does not have any student representation. This is indicative of the lack of community engagement that characterizes the thinking and values in an unsustainable culture. Teams engaged in dialogue and critical thinking may be the antidote.

To conclude this exploration of the challenges inherent in implementing sustainability at institutions of higher learning, the following highlights the significance of dialogue:

We understand dialogue as the ongoing civil project of building collective norms and values through the broad exchange, articulation and dissemination of knowledge through active sources of dialogue, information and discussion on the behalf of citizens. By examining the historical context of dialogue in Canada, we demonstrate how this concept has been successfully used in the past to coordinate, organize and stimulate crucial discussions around issues of public interest and importance. Secondly, we suggest dialogue has the ability to bridge asymmetries in democratic practices, by building collective norms, values and governance among diverse sectors (or “stakeholders” in the modern parlance of government) of Canadian society. In this way, dialogue differs from

consensus building, agenda setting and consultation, since it provides a more permanent, engaged, open-ended and inclusive modality of shared decision making with the public.

(Naylor & Dale, 2003, p. 1)

One of these authors, Ann Dale, has made the focus of her career the utilization of dialogue to advance the sustainability agenda. In 2009 Algonquin hosted one round of dialogue events on sustainability (Algonquin College, 2009b), but no structure was put in place to continue the conversation and implement ideas. The challenge lies in keeping discussions going.

A final notable challenge in education for sustainability is exemplified by the infusion debate. Some educators advocate for environmental studies as a distinct curriculum because infusion is viewed as having been poorly implemented (Puk & Behm, 2003, p. 217). With infusion, instructors are expected to use environment or sustainability concepts to teach existing curriculum. However without themselves benefiting from sustainability-focused professional development, they may see sustainability as just one more thing to squeeze into the curriculum. The Ontario Ministry of Education and Training has defended the infusion model (Puk & Behm, 2003, p. 217). While in theory infusion seems to suit the multidisciplinary nature of environment or sustainability concepts, the same old discipline-driven, test-oriented framework dominates the delivery of education and prevents the necessary accommodations. Also, without teachers who specialize in education for sustainability, there is no guarantee of enthusiasm or competency. On the other hand, at the post-secondary level of education, as students specialize in one area of study, there is a need for infusion so that no one misses out on education for sustainability. Clearly both approaches have benefits and institutions need not necessarily choose between them. Ideally all college graduates will be ecoliterate and some will be sustainability leaders.

Education for sustainability at Algonquin today.

The following section discusses current courses and programs relevant to sustainability at Algonquin College. *The Algonquin Experience* is “an academic area thought leadership paper in response to the college strategic plan 2008-2013” (Algonquin College, 2009c), and it lists some of the curricula seen as relevant to the environment by the authors of the paper. Critically, however, there is not a sustainability section within this document. There is an “environmental responsibility” section. *The Algonquin Experience* represents a synthesis of ten white papers, one of which addressed sustainability. While the authors of the sustainability white paper demonstrated an understanding of the depth and complexity of education for sustainability (as evidenced in earlier descriptions) it was not so with those authoring *The Algonquin Experience*. The relegation of sustainability to a consideration of environmental issues suggests that the authors of “The Algonquin Experience” either do not grasp the concept of sustainability or do not see the value of making it a part of the Algonquin experience. “The Algonquin Experience” says, “current ‘green’-focused programs include:

- Green Architecture (Woodroffe Campus)
- Green Business Management (Woodroffe Campus)
- Water and Waste Water Technician (Woodroffe Campus)
- Construction Carpentry - Advanced Housing (Perth Campus)
- Forestry Technician (Pembroke Campus)” (Algonquin College, 2009c).

The program descriptions make negligible references to sustainability. There is no indication that they appreciate sustainability has having contact with the social and economic implications of students’ career choices or use the holistic approach that characterizes education for sustainability. They are, as *The Algonquin Experience* says, ‘green’-focused programs as opposed to sustainability-focused programs.

Other environmentally focused curricula at Algonquin include the Outdoor Adventure, Outdoor Adventure Naturalist, and Environmental Studies programs. Three related elective courses are Environmental Citizenship, Literature and the Environment, and Living Green. Cumulatively the available general education electives provide insight into the status of sustainability. Examples include course titles such as: The Impact of the Car on North America; Healthy Lifestyle; Ethics: What's the Big Deal?; World Religions; Conserving Canada's Architectural Heritage; Communication Dynamics; A Cultural Diversity Quest; Critical Thinking; Introduction to Personal Finance; and The Middle East: An Understanding of Media Sources & Their Impact. While any given student only takes a few of these courses, together they could prepare students to begin addressing the three pillars of sustainability at home and at work. One Algonquin program is explicitly about sustainability. New this fall, the Sustainability Education program prepares formal or informal educators to infuse sustainability into their curricula. One of the elective course options for students in this and other programs is a course called Globalization and Sustainability.

North American Colleges' Education for Sustainability

For this thesis I sought out the trends in education for sustainability at North American colleges and institutes of technology. This sample was deemed manageable for analysis within this study. Also, the experiences of these institutions (as opposed to, for example, universities or institutions in the developing world) would be more helpful and applicable for those at Algonquin College wanting to make use of this research. All the information regarding trends in education for sustainability can be found in Tables 1 - 6. Throughout the literature review, results, discussion, and conclusions of this thesis, the trends are grouped into either content or formatting in no particular order. Formatting is critically important because the challenges that

institutions are experiencing are often due to the conflict between newer thinking and older pedagogical structures. Appendix B includes additional research regarding the social justice implications of colleges delivering education regarding: sustainable food; sustainable design; sustainable law and policy; and experiential learning. The appendix also quickly describes extra-curricular education for sustainability and potential new curricular content addressing sustainable health, transportation, and waste management.

Table 1

Trends in content of education for sustainability: sustainable food

Trend in content of education for sustainability	Name of college and name of program	Notes about program
Sustainable Culinary Programs	Seattle Central Community College, Seattle Culinary Academy	-60 years of helping to build the city's sustainable foods industry, major local trend (Seattle Central Community College, 2009)
	Sterling College, Farming, Cooking, and the Rural Experience	-"students are immersed in a sustainable food system, learning from successful food activists and agricultural entrepreneurs" (Sterling College, 2011)
	Central Carolina Community College, Natural Chef Culinary Program	-"entry level career in culinary arts, with a specialty in sustainability and nutrition that will assist them in becoming a leader in the industry" (Central Carolina Community College, 2011)
Sustainable Agriculture Systems/Regulation	Nova Scotia Agricultural College, Certificate of Specialization in Organic Agriculture	
	Assiniboine College, Organic Inspector Certificate Program	
	Rio Salado College, Sustainable Food Systems	
	College of Marin, Sustainable Food	

	Systems	
	St. Lawrence College, Sustainable Local Food Certificate	-“This certificate explores the practices, principles and philosophies involved in local food system development” (St. Lawrence College, n.d.).
Sustainable Agriculture	Fleming College, Sustainable Agriculture	
	Goshen College, Agroecology Summer Intensive	
	Johnson County Community College, Sustainable Agriculture Entrepreneurship	
	San Diego City College, Sustainable Urban Agriculture Certificate	
Horticulture Therapy	Ambler College, Horticulture Therapy	

Table 2

Trends in content of education for sustainability: sustainable design

Trend in content of education for sustainability	Name of college and name of program	Notes about program
Sustainable land-use planning	Birmingham-Southern College, Urban Environmental Studies	-acknowledges that city populations continue to rise so urban environmental issues must be well understood (Birmingham-Southern College, 2011)
	Georgia Institute of Technology, Land Use Planning	-“In recent years, land use has emerged as one of the key components of sustainability. Land use decisions have direct and massive impacts on water quality, air quality, biodiversity, energy consumption, and nearly every other aspect of sustainability” (Georgia Tech College of Architecture, n.d.).
	Massachusetts Institute of Technology, Urban and Environmental	

	Policy and Planning	
	Boston Architectural College, Sustainable Design	
	Virginia Polytechnic Institute, BA in Public and Urban Affairs	
	Nova Scotia Community College, Community & Environmental Planning Concentration	
Sustainable building	Rochester Institute of Technology, Master of Architecture	<p>-“founded upon the principle that architecture programs can no longer afford to teach anything other than sustainable architecture”</p> <p>-“traditional courses... will be taught through the lens of sustainability”</p> <p>-students can study “pollution prevention, sustainable engineering, urban and community studies, and public policy” (Rochester Institute of Technology, 2011)</p>
	Fleming College, Sustainable Building Design and Construction	-Students have helped develop prefabricated straw bale wall technology making the building method more widely accessible (Fleming College, 2009).
	Okanagan College, Green Building Design and Construction Certificate	
	Mount Hood Community College, The Sustainable Building Advisor Training Program	
Building renovation	Loyalist College, Construction Renovation Techniques	
	Lambton College, Renovation Technician	
	Algonquin College, Adaptive Reuse of	-“the most sustainable building is the one that is already built” (Algonquin College, 2011a)

	Buildings	
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Table 3

Trends in content of education for sustainability: renewable energy

Trend in content of education for sustainability	Name of college and name of program	Notes about program
Energy and building programs	Cambrian College, Energy Systems Technology Program	-“prepares students to work on energy systems in two directions, modeling of green buildings and the design of renewable energy conversion systems” -students perform experimental work with up to four types of renewable energy (Cambrian College, 2011)
	Humber College, Sustainable Energy and Building Technology	-positions graduates “to work effectively with other professionals to provide integrated solutions for the energy efficiency, green building and renewable energy sector” (Humber School of Applied Technology, n.d.)
	Bristol Community College, Engineering and Renewable Energy	-the National Science Foundation gave the college \$900 000 for a project called Sustainability and Green Energy Across the Curriculum, local businesses are also involved (Welker, 2011)
Energy efficiency programs	Durham College, Energy Audit Techniques	
	Holland College, Wind Turbine Technician	
	Centennial College, Solar Photovoltaic Training for Aboriginals	-program “covers the fundamentals of solar powered electrical generation systems. These include practical considerations related to system design, as well as hands-on installation and safety training. It also includes basic business skills” (Centennial College, n.d.)
	Greenfield College, Renewable Energy/Energy Efficiency Certificate	
	Lane Community	-“The Energy Management Program was born in

	College, Energy Management Program	1980... with an emphasis in residential energy efficiency / solar energy systems and has evolved to include commercial energy efficiency and renewable energy system installation technology” (Lane, 2011)
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Table 4

Trends in content of education for sustainability: sustainability via law and policy

Trend in content of education for sustainability	Name of college and name of program	Notes about program
Traditional Ecological Knowledge	College of New Caledonia, Aboriginal Forest Resource Technology	
	Northwest Community College, First Nations Land Stewardship	
Sustainable Law	Lewis & Clark College, Environmental and Natural Resources	
	Boston College, Environmental & Land Use Law	-“designed to encourage service and train professionals in areas of increasingly critical importance to the lives and prosperity of people around the nation and the world, and to sustainability of the land, air, and water resources which support the myriad interlocking ecosystems that constitute life on the planet” (Boston College Law, 2011)
	Illinois Institute of Technology, Environmental and Energy Law	
Sustainable Law Enforcement	Lethbridge College, Conservation Enforcement	
	Northwest Community College, Coastal Guardian Watchmen	

Sustainable Policy	Claremont McKenna College, Environment, Economics, and Politics	
	Rensselaer Polytechnic Institute, Ecological Economics, Values, and Policy	
	New Jersey Institute of Technology, Sustainability Policy & Environmental Management	-“Society faces three interlocking problems as we move deeper into the twenty-first century—global population that will reach 10 billion by 2050, depletion of several key natural resources, and climate change and its likely ecological consequences. The field of sustainability policy and environmental management is designed to systematically address these challenges” (New Jersey Institute of Technology, 2011).
Sustainable Community Development	Northland College, Sustainable Community Development	
	Prescott College, Sustainable Community Development	
	College of Menominee Nation, Sustainable Community Development	

Table 5

Trends in content of education for sustainability: sustainability studies

Trend in content of education for sustainability	Name of college and name of program	Notes about program
Sustainability Studies	Daemen College, Global and Local Sustainability	<p>-students choose an area of concentration: the liberal arts; business; health care studies; or education</p> <p>-program supported by an extensive network of partnerships established by Daemen College Center for Sustainable Communities and Civic Engagement</p> <p>-students “integrate coursework in developing practical solutions to community problems” (Daemen College, 2011)</p>
	Gateway Community College, Sustainability Studies	
	Mercyhurst College, Sustainability Studies Major	
Sustainability Leadership	Ithaca College, Sustainability Leadership	-“designed for practitioners who want to improve their skills and knowledge of “best practices” in order to lead effective sustainability initiatives in their university, corporation, community or municipality” (Ithaca College, 2011)
	Edgewood College, Sustainability Leadership	
Sustainability Education	Algonquin College, Sustainability Education	-assists formal and informal educators to use their existing curriculum as a basis for dialogue and action for sustainability (Algonquin College, 2008b)
	Prescott College, Sustainability Education	

Table 6

Trends in formatting of education for sustainability

Trend in format of education for sustainability	Name of college and name of program	Notes about program
Interdisciplinary learning	Humber College, Sustainable Energy and Building Technology Co-op	-reflects trend of designing and building with a highly informed approach to energy (Humber School of Applied Technology, n.d.)
	Humber College, School of Media Studies and Information Technology	-“students are encouraged to consider the economic, social and environmental impact of a decision” -“our faculty’s commitment to the environment motivates students to develop innovative ways to solve ecological and social problems” (Humber College, 2010)
	Birmingham-Southern College, Urban Environmental Studies	-“Our world needs a new generation of leaders-educated professionals who understand the complex relationship between human welfare and environmental sustainability... [BSC] provides the ideal setting to train socially and environmentally literate leaders” (Birmingham-Southern College, 2011).
	Virginia Polytechnic Institute, BA in Public and Urban Affairs	-“Students learn to address the political, economic, environmental, social, and governmental consequences of growth and change and to help resolve the problems that emanate from them” (Virginia Tech, 2011).
	Bauman College, Holistic Nutrition and Culinary Arts	-“Become a certified Nutrition Consultant and/or certified Natural Chef. Career opportunities in nutrition and whole foods culinary arts are dramatically increasing as the value of good nutrition and a healthy lifestyle becomes more widely recognized in society” (Bauman College, 2011).
Experiential learning	Berea College, Ecological Design	-students design and carry out renovation projects on campus (Berea College, 2009b)
	Mercyhurst College, Business Assistants	-trains “business assistants skilled in analyzing environmental impacts from a company’s practices and completing environmental risk audits”

		(Mercyhurst College, 2011)
	Principia College, Sustainable Development students & Blackburn College, Chemistry students	-students converted a truck to run on used vegetable oil instead of diesel or transformed used vegetable oil into biodiesel (Dettro, 2011; Principia College, 2011)
	Grand Rapids Community College	-“matching the needs of Equest [community partner] to the learning objectives in our classes” -facilitation of experiential learning opportunities is done by the college’s Academic Service Learning Center (Grand Rapids Community College, 2010)
Community Partnerships	College of Marin	-Bay Area Alliance for Sustainable Food Systems: Education, Workforce and Economic Development Project (three colleges involved) -the project has financial commitments from more than 26 industry partners -the project is unique in that it is the first industry-driven workforce development program in the state (College of Marin, 2009)
	Sheridan College	-held a Coop Employer Appreciation Breakfast with keynote address regarding sustainability (Sheridan Institute, 2011)
	College of the North Atlantic	-established a partnership with the Newfoundland and Labrador Housing Corporation wherein people in need of retraining gained real world experience renovating public housing units to make them more energy efficient (Cvent Event, Survey & eMarketing Solutions, 2011)
	Fleming College	-participated in the creation of the Centre for Alternative Wastewater Treatment wherein students gained experience with applied research, community service and industrial innovation (Fleming College, 2011)
	Cambrian College	-given \$2 million towards its Sustainable Energy Center by Xstrata Nickel -the company’s vice president explained how he was witnessing climate change in Canada’s north therefore his intention was to support innovation for sustainability at the college (Carmichael, 2009)

Conclusion of the Literature Review

This review of the literature has covered diverse subjects that are relevant to the central research question: in what ways could Algonquin College expand its education for sustainability? The first section of the literature review began with a critique by David Orr of the paradigm that has shaped current educational systems globally, including institutions of higher learning. Orr suggests that an antidote to the current education for unsustainability is that all education be environmental education. Other authors' ideas were reviewed to illustrate the claimed irreconcilability of consumer society with participatory society, and competitiveness with shared prosperity. This necessitated bringing to light the myth of independence and the value of ecoliteracy or understanding one's roles in the web of life. This first section of the literature review concluded with narratives from Transition towns, wherein there is a vibrant culture of community participation in sustainability initiatives.

The second part of the literature review covered the international Talloires Declaration, the ACCC Pan-Canadian Sustainability Protocol, as well as the work of AASHE and the STARS sustainability rating system for colleges and universities. Algonquin's sustainability initiatives were then introduced, beginning with the formation of SASC and the creation of a best practices report and a white paper on sustainability. Next came an explanation of common challenges being experienced internationally by institutions attempting to implement the Talloires Declaration. Case studies were shared of colleges doing an exemplary job of surmounting said challenges. Finally, this section concluded with an inventory of existing sustainability-related courses and programs at Algonquin College.

The final section of the literature review was intended to highlight pertinent trends in how other North American colleges are educating for sustainability. First, new sustainability-focused

programs in agriculture, design (including urban planning), health, energy, law and policy were briefly described. Also mentioned were new programs devoted entirely to the study of sustainability itself and to preparing students to bring new thinking and practices into an array of workplaces. The new college programs cannot be explained without delving into some of their characteristics. Sustainability-related subject matter is often being taught in an interdisciplinary way, incorporating knowledge from related fields, and contributing to a holistic understanding of subject matter. There is also a focus at many institutions of providing hands-on learning, as this too is considered compatible with, if not necessary for, education for sustainability. The last trend is community involvement in education for sustainability and student engagement with diverse project partners to accomplish real-world goals. All the themes that have arisen in the literature review will surface again either in the responses from research participants or the concluding recommendations of the researcher.

Chapter Three: Research Methodology

The research described in this thesis focused on developing recommendations for new learning opportunities in the area of sustainability specifically within Algonquin College. With this purpose in mind the chosen methodology was to perform a needs analysis that could then be fed into suggestions for program design. The needs analysis involved data collection through surveys and a study of the current program offerings of the college. The program design suggestions were generated by the survey results and then critiqued by an open-membership committee. Several research methodologies influenced my approach and these will be discussed prior to an in-depth explanation of the methods that were actually used. These methodologies are important because they include participatory means of conducting research and complement the topic of sustainability.

Methodologies Influencing the Research Design

Participatory Action Research (PAR) would have been well-suited to this thesis research yet it was not feasible as there was no committed group of participants with whom to collaborate. From the outset, PAR involves the active participation of those who will apply the results (and who have shared ownership of the issue or problem that is to be addressed). In PAR, the researcher and the research participants collectively reflect on an existing initiative, organization, or challenge and decide on research questions that will generate the knowledge needed to make change for the better. The first reason PAR would have helped Algonquin enhance its capacity to educate for sustainability is that new programs and especially modifications to existing programs need to be understood and embraced by the community. Community involvement in creating change within an organization has the potential to enhance ownership of the outcomes. A second reason PAR would have helped with this thesis is that infusing concepts of

sustainability into existing programs is a relatively new and poorly understood approach in many post-secondary institutions. Staff and faculty do not necessarily have the prior knowledge needed to apply the ideas of social, ecological, and economic sustainability to their current, ongoing instruction. PAR might have spread an understanding of sustainability by involving staff and faculty in planning for research they perceived as necessary to help them educate for sustainability. A third and final reason that PAR was considered as an approach was that there would have been a provision for the use of the research results. While I did work with Academic Development at the college, there was no explicit plan for incorporating the suggestions generated from the research participants.

The following definition of the Appreciative Inquiry methodology even alludes to the three pillars of sustainability: economic, social and ecological.

Appreciative Inquiry [AI] is the cooperative, coevolutionary search for the best in people, their organization and the world around them. It involves systematic discovery of what gives life to an organization or a community when it is most effective and most capable in economic, ecological and human terms. (Cooperrider & Kaplin Whitney, 2005, p. 8)

AI was not appropriate for this research because of limited time and collaboration. Also, it was deemed preferable to have respondents answer a series of questions rather than allow them to determine key themes for Algonquin's consideration. However, Appreciative Inquiry would have assisted in understanding the current state of education for sustainability at Algonquin College and envisioning the future. Generative Inquiry (Bushe, 2007) is an extension to AI that is intended to ensure that the method goes beyond "appreciating" the present and focuses on "generating" visions for change. In this research the needs analysis phase sometimes

approximated elements of Appreciative and Generative Inquiry as did the community dialogue event in the program design phase.

Methods Used in the Research Design

As a novice researcher I was an outsider who visited the campuses infrequently and only slowly made connections at the college. Consequently, the Analyse and Design research method was ideal. The ADDIE process of which Analyse and Design are stages is specifically intended for pedagogical application, that is, for the design and development of curriculum and instruction. The Analyse and Design steps employed in this study are the first two of five in an educational design process known as ADDIE (analyse, design, develop, implement, and evaluate) (Dick, Carey, & Carey, 2004). While it was part of the original plan to design new curricula it became apparent that, with limited time and collaboration, the most that could be produced were recommendations for design of new curricula. Determining the needs for this design was the first purpose of the study. Further, a two-part needs analysis seemed appropriate in which I first explored student understanding of sustainability and gathered off-campus suggestions for program development/modification before designing a survey intended for broader on-campus involvement based on the first phase. See Table 7 for an overview of the methods used in this study. (Please note that the words participant and respondent were used interchangeably throughout this thesis.)

Table 7

Sequence Of Methods and Participant Groups Involved in the Research

Phase of the research program	Purpose/ goals	Who was involved	Method used	Supporting documents
Needs analysis: phase one part one	Gather responses to research questions 2,3,6,7,8	Six members of Transition Ottawa and nine members of the general public in Ottawa completed the survey	Survey questionnaire hosted online by Fluid Surveys Separate online discussion forums for each group	Questions participants were asked are in Appendix A
Needs analysis: phase one part two	Gather responses to research questions 1,2,7	29 Algonquin students completed surveys Two Green Business Management students were research assistants	Clipboard survey conducted in the Woodroffe campus cafeteria	Questions participants were asked are in Appendix A
Needs analysis: phase two	Gather responses to research questions 1,2,6,7	329 AC staff, faculty, and students completed the survey	Survey questionnaire hosted online by Fluid Surveys Online discussion forum	Questions participants were asked are in Appendix A
Program Design	Gather responses to research questions 2,4,5,6,7	Eight people attended a Program Recommendation Committee meeting	Committee met once to hear a synopsis of the literature review and research results In that same meeting discussion questions were used to develop recommendations for Algonquin	Program Recommendation Committee discussion questions are in Chapter Four

Needs analysis.***Phase one: part one.***

In the first phase of the needs analysis two respondent groups were asked to answer the same five questions in an online questionnaire. The questionnaire was hosted by Fluid Surveys,

a Canadian company incubated by Algonquin (<http://www.fluidsurveys.com>). The first group surveyed was comprised of members of the general public of Ottawa who were recruited through posters placed in three areas of downtown Ottawa. A blog was used to inform participants of their rights (<http://www.nataliesthesis.wordpress.com>) and directed them to the survey. The second surveyed research group was comprised of members of the grassroots activist group Transition Ottawa. This organization agreed to support my research through its existing online discussion forum (<http://www.transitionottawa.ning.com>). The participants in Transition Ottawa found out about the research through their participation with the organization and were informed of their rights through the group's discussion forum, and could then elect to link to the online survey. The Transition Ottawa website is a hub for its members, who are already engaged in local dialogue and action for sustainability. After completing the online questionnaire (see Appendix A for the questions), respondents from both groups were asked to return to either the blog or the Transition Ottawa website, to participate in a discussion forum. The questionnaire and discussion forums were available for one month. While the survey was a qualified success, there was no participation in the discussion forums so they will not be mentioned further in this report. A summary of methods and research participant groups is found in Table 1.

Phase one: part two.

The second part of phase one of the needs analysis was a clipboard survey conducted during one lunch hour at Algonquin College's Woodroffe campus cafeteria. The purpose was to determine if students were learning about sustainability and if they thought the college should prepare students to address sustainability in their careers. Two student assistants worked with me to conduct the survey. In that the assistants were evaluating the college as an assignment for their Corporate Social Responsibility class they were allowed to use the research results after I

had tabulated them (though they were not allowed to see the actual writing done by their fellow students). The four-question survey was presented to participants in print form and was completed and returned immediately by the respondents. The survey questions are included in Appendix A.

Phase two.

The responses to the research questions in both parts of phase one were enormously instructive in formatting and wording the final survey. The purpose of phase two was to understand perspectives and gather suggestions from within the Algonquin community. The Students' Association, Public Relations, and various department representatives enlisted by myself and the research sponsor (Algonquin College Applied Research and Innovation) assisted by promoting completion of the survey. In this second phase of the needs analysis interested students, staff, and faculty were directed to the Algonquin College website algonquincollege.com, where they learned about the research project and were informed of their rights as participants prior to completing the three-page online survey. At the end of the survey respondents were provided with a link to an online discussion forum. The survey was open for two weeks. The questions can be viewed in Appendix A.

Program design.

The final phase of the research was comprised of a committee meeting wherein interested students, staff, and faculty were presented with the results of the surveys as well as a summary of the North American trends in education for sustainability (as they were summarized in Chapter Two of this thesis). The participants then helped to form recommendations for Algonquin College regarding new and modified sustainability-related programs and courses. Membership on the committee was open to anyone at Algonquin. The opportunity to participate was

advertised at the bottom of the online survey and then subsequently on the college homepage (<http://www.algonquincollege.com>). The results of the meeting were to be shared with the college community at large, the Department of Academic Development, the Sustainable Algonquin Steering Committee, and the Strategic Programs and Services Planning Secretariat.

Chapter Four: Research Results

Results of the Off-Campus Survey

The survey responses from the fifteen online, off-campus Ottawa participants were very helpful. The Ottawans generated many useful suggestions regarding education for sustainability at Algonquin College. The group of fifteen included six members of Transition Ottawa (40% of the respondents) and nine other at-large participants (60% of the respondents). While the Transition Ottawa members were invited to participate due to their prior knowledge of sustainability most respondents, whether members of Transition Ottawa or not, had very informed opinions about education for sustainability. As both groups responded to the same survey questions I could not distinguish which answers came from members of which group. The survey was comprised of six short answer, open-ended questions. Participants' answers were often tangential with responses making sense but not necessarily directly relating to the question asked. Respondents sometimes mentioned ideas repeatedly in answering the survey questions. Thus, in the reported results, when an idea is scored as being mentioned eight times, that does not necessarily mean that eight different people made that response.

Most participants answered all six survey questions but two chose a different route. The first of these two respondents only stated that he felt the questions required in-depth prior knowledge of Algonquin College and he did not answer the survey questions. The second did not answer any of the survey questions either but he wrote a message that he strongly wanted to be included in the discussion of what should be taught at colleges for the actualization of sustainability. The message was that sustainability should not be discussed without an acknowledgement of overpopulation; this survey respondent felt strongly that Algonquin College should teach students to curb population growth.

Ottawans' ideas for the content of education for sustainability.

The two questions regarding content were as follows: What careers would make our society more sustainable? What curriculum could Algonquin College provide to prepare students to support sustainability in their careers? The most common suggestion from the Ottawans who completed the online survey, mentioned 17 times, was that Algonquin College should create a sustainable agriculture program. The next most popular suggestion, mentioned ten times, was that Algonquin students should be involved with creating sustainable transportation solutions for the city. The respondents referred to both personal and public transportation. An idea presented regarding personal transportation was that students experiment with designs for an enclosed hybrid electric bicycle.

Energy was mentioned nine times by the survey respondents. The respondents thought that Algonquin should prepare interested students to work with renewable energy sources such as wind and solar. Closely related, and mentioned seven times, was the idea of design referring to the design of buildings, products and landscapes. Permaculture, which was mentioned six times, is a system for designing communities that works with local culture and climate while cycling all waste (Permaculture Institute, 2011). Respondents inferred that this would be a valuable framework for teaching about energy, waste, food, design, and/or building.

Waste was also mentioned six times and respondents emphasized that students could be involved with creating and instituting new sustainable practices for the broader community. Two waste-related suggestions were made regarding students researching and developing systems that cycle biological waste back into fertilizer. Urban planning was suggested four times as something that should be taught at Algonquin. Sustainable building also was mentioned four times. This is something the College is already beginning to teach; however, there are many

approaches to the subject as evidenced by the respondent who suggested that students learn to use local, less-processed materials for building.

Ottawans' ideas for formatting education for sustainability.

Survey participants were asked: Could combining skills and knowledge from diverse program areas make Algonquin graduates into sustainability specialists? If so, how? Listed here are responses to this question and formatting suggestions that surfaced in the answering of other questions as well. Nine responses indicated that interdisciplinary learning was important for sustainability. It was mentioned seven times that sustainability ought to be embedded into all or most existing programs and courses (instead of making sustainability into a specialized field). Two of these responses indicated that students should also learn how to address sustainability in their day-to-day activities. Two responses stated that the college should focus primarily on a few new programs for emerging sustainability-related careers. Another idea expressed in two responses was the provision of a basic introductory elective course explaining the principles and applications of sustainability. A concern with interdisciplinary studies was expressed in two responses. The concern of these respondents was that in-depth knowledge could be compromised in an effort to create links between subjects. One respondent said that business students especially should learn to address sustainability in their work. Another respondent emphasized that students should learn to think critically about how the term "sustainability" is used. One respondent suggested that each program have a course focused on new best practices for sustainability in that specific field, i.e. policing, nursing or engineering.

Ottawans' ideas for learning with the community.

Survey respondents provided a plethora of interesting ideas in response to this question: How can Algonquin work with community partners to prepare students to support sustainability

in their careers? A salient point was that some respondents thought that to be prepared to address sustainability in their careers, students should be required to interact with the community during their studies. Of the four times this was mentioned, one response focused on the idea of applying knowledge, another on knowing best practices and a third on the examination of real case studies. Another suggestion, offered in three responses, was that the college should partner with businesses. Two of the three proposed that students could do sustainability (or oil dependency) audits to help businesses become more sustainable. The remaining respondent in this group suggested that Algonquin develop and market courses to be taken by the business operators themselves.

The following ideas were all mentioned twice. It was suggested that community partners not only provide students with exposure to real world sustainability initiatives, that they could actually help to develop and deliver college curriculum. Respondents explained that having students work with community partners could take the forms of internships, co-op placements and research projects. It was also suggested that guest speakers could come to talk with students about current sustainability-related best practices in their industries. While all of these things already happen at Algonquin the research participants indicated that they should be central and not peripheral in students' educational experiences. Also mentioned twice were the benefits for education for sustainability if Algonquin was to formalize relationships with government and non-profits. One respondent suggested that students work with government to create databases of new information about sustainability that they would still be able to access as alumni. Non-profits were thought to be good allies to assist in exposing students to community sustainability projects. The examples given were Sustainable Living Ottawa West and Sustainable Living

Ottawa East, organizations that celebrate and promote sustainable lifestyles and low-carbon culture.

Respondents had some specific ideas about how students could learn out in the community. One said that nursing students could help local hospitals implement policies and practices they had learned about sustainable health care. It was suggested that students work with architects on new, more sustainable college buildings. One respondent said that the Canadian Organic Growers could help students learn to grow food on campus. Another suggested that media students could create films about local sustainability projects and journalism students could write about them for local newspapers. A final suggestion was that engineering students work with community partners to create more sustainable commuting options for Ottawans.

The following ideas were all mentioned once in the Ottawans' responses. A respondent suggested that students could work with the city on the development and implementation of new practices that contribute to the community's sustainability. Another respondent thought that the college's library could make even more publications available relating to sustainable lifestyles and new sustainability-related developments in workplaces. It was suggested that there is funding that could be accessed by the college for the development of these new opportunities and the college could then publicly recognize the funding agencies or corporate partners. Another suggestion, and one that is already happening, is the integration of college programs with local university programs. This ties in with the suggestion that the college support the sharing of sustainability-related ideas across disciplines, departments, industries and institutions. This was suggested because such sharing accelerates the understanding and adoption of sustainable practices.

Ottawans on Algonquin as a sustainability specialist.

The final survey question asked Ottawans if they felt that Algonquin should strive to specialize in education for sustainability. (Note that the term “sustainability specialist” was used in the early part of the research but later the term “sustainability leader” was adopted instead.) Of the 15 online survey respondents, 11 said yes. The reason given in five of these responses was that this would distinguish the college as a socially responsible, cutting edge institution. Three responses suggested that this would produce a unique pool of graduates who would be especially attractive to employers. Three responses also indicated that if the college specialized in education for sustainability, Algonquin graduates would have a solid understanding of how they could contribute to the acknowledged growing need for sustainable practices. Two responses mentioned the spreading of a sustainability ethos as a benefit to Algonquin in becoming a sustainability specialist.

Ottawans on Algonquin’s strengths and weaknesses.

One especially challenging question was put to the off-campus participants and that was: In preparing students to support sustainability in their careers are you aware of any of Algonquin College’s unique strengths, weaknesses, opportunities or challenges? Seven responses or lack of responses indicated that participants were not familiar enough with the college to comment. Responses regarding opportunities were included above under the appropriate headings. Only one respondent shared what she perceived as challenges and those were the need for funding and the need for the right attitude. The following strengths were each put forth once. Algonquin has been at the forefront of providing job training for a changing labour market. The college has existing sustainability commitments and existing environmentally focused curricula. The broader community includes many individuals and organizations with skills Algonquin may wish

to begin teaching. Algonquin is able to access many resources from government ministries, lobby groups, and local universities. A final perceived strength of the college was that it has access to young minds.

Results of the Clipboard Survey

In order to become acquainted with the sustainability-related views of the students, a clipboard survey was conducted in the cafeteria of the Woodroffe campus of Algonquin College. There were 29 respondents having a mean age of 20 who provided written responses to the four questions asked. There was tremendous diversity in the programs in which the student respondents were enrolled, for example: Police Foundations, Culinary Management, Corporate Security Risk Management, and Game Development. Survey respondents had attended an average of three semesters. The most significant finding from the clipboard survey was that 62% of the respondents said that they did not learn about sustainability in their programs while 65% thought that everyone should learn about sustainability in their programs. Just over one third of the respondents defined sustainability as being related to the environment, proper management of resources, or “not wasting”. Approximately one third related sustainability to long-term career success. No respondents mentioned the three pillars of sustainability. As they were unable to define the concept, it follows that their support for education for sustainability was essentially intuitive.

Of those reporting that they did learn about sustainability in their programs (less than a third of respondents) all but two said that they mainly learned about its social and/or economic aspects. Only a third of respondents had ideas of how to support sustainability on their career paths and of those, half were directly related to the environment. Although most of these responses were very vague there was an exception in that one student in Culinary Management

was very concerned with the waste generated and practices modeled in her program. This respondent also suggested that Algonquin should have an eco-friendly cafeteria and linked the idea to economic sustainability by saying that if students brought their own cups the price of coffee could be less.

Results from the On-campus Survey Multiple Choice Questions

Tables 8 – 20 display the responses to the multiple choice questions from the survey completed by 329 Algonquin students, staff, and faculty.

Table 8

On-Campus Respondent Demographics: Part One

Are you:		
Response	Percentage	Count
a student?	55%	180
staff?	26%	84
faculty?	20%	65
	Total responses:	329

Table 9

On-Campus Respondent Demographics: Part Two

Are you at:		
Response	Percentage	Count
Woodroffe campus?	72%	237
Pemboke campus?	16%	52
Perth campus?	12%	39
	Total responses:	328

Table 10

On-Campus Respondent Demographics: Part Three

Do you have an interest in sustainability?		
Response	Percentage	Count
No.	2%	5
Not sure.	8%	25
Somewhat.	28%	92
Definitely.	63%	206
	Total responses:	328

These previous three questions gathered demographic information. Together they reveal that most respondents were from Woodroffe campus, over half were students and 90% were at least somewhat interested in sustainability.

Table 11

On-Campus Respondents on Formatting: Question One

Should Algonquin have off-campus community partners to help students learn about new trends in sustainability in the workplace?		
Response	Percentage	Count
No.	2%	6
Not sure.	4%	13
Maybe.	37%	120
Definitely.	57%	188
	Total responses:	327

Table 12

On Campus Respondents on Formatting: Question Two

Do you think that there should be more electives at Algonquin that teach about sustainability?		
Response	Percentage	Count
No.	4%	12
Not sure.	8%	27
Yes, how to be sustainable in my personal life.	6%	21
Yes, how to be sustainable in my career.	8%	26
Yes, both types of courses.	74%	239
	Total responses:	325

These previous two questions regarding formatting reveal a considerable interest in having students learn from off-campus community partners and in elective courses teaching about both personal and professional sustainable practices.

Table 13

On-Campus Respondents on Content: Question Three

The following are some new sustainability-focused programs that other Canadian colleges are developing. Do you think Algonquin should have similar programs?					
	No	Not sure	Maybe	Definitely	Total
Ecotourism	21 (7%)	33 (10%)	101 (31%)	166 (52%)	321
Sustainable Hospitality	10 (3%)	34 (11%)	95 (30%)	182 (57%)	321
Renewable Resources Management	2 (1%)	18 (6%)	69 (21%)	232 (72%)	321
Landscape Architectural Technology	4 (1%)	25 (8%)	111 (35%)	180 (56%)	320
Resource and Environmental Law	9 (3%)	36 (11%)	94 (30%)	179 (56%)	318
First Nations	27 (8%)	48 (15%)	107 (34%)	136 (43%)	318

Land Stewardship					
Environmental Engineering	7 (2%)	27 (8%)	80 (25%)	204 (64%)	318
Ecological Restoration	4 (1%)	30 (9%)	82 (26%)	201 (63%)	317
Sustainable Agriculture	12 (4%)	30 (9%)	73 (23%)	206 (64%)	321
Renewable Energy (Wind and Solar)	5 (2%)	14 (4%)	61 (19%)	244 (75%)	324
Urban and Rural Planning	2 (1%)	22 (7%)	87 (27%)	210 (65%)	321

Renewable Energy was the most popular idea for a new program at Algonquin. The second most popular was Renewable Resources Management followed by Urban and Rural Planning.

Table 14

On-Campus Respondents on Engagement: Question Four

Should the Algonquin website have a page explaining current programs and courses related to sustainability as well as new sustainability-related curriculum being developed?		
Response	Percentage	Count
No.	3%	8
Not sure.	5%	16
Yes, I didn't know about Algonquin's commitment to sustainability.	36%	109
Yes, it would be good to know more about Algonquin's commitment to sustainability.	56%	168
	Total responses:	301

These responses reveal a need for Algonquin to better promote existing sustainability-focused courses and programs as well as its institutional commitment to sustainability. Over a third claimed to not have known about Algonquin sustainability commitments.

Table 15

On-Campus Respondents on Formatting: Question Five

Throughout March as a part of this research project residents of Ottawa provided ideas about Education for Sustainability at Algonquin College. Please indicate if you like their ideas.					
	No	Not sure	Maybe	Definitely	Total
Media Students Get Credits Promoting Community Sustainability Initiatives	17 (6%)	38 (13%)	112 (37%)	133 (44%)	300
Internships with Sustainable Designers (of products, home or landscapes)	2 (1%)	17 (6%)	65 (21%)	220 (72%)	304
Students Participate in Sustainable Transportation Research Projects	7 (2%)	21 (7%)	65 (21%)	211 (69%)	304
Students Earn Credits Supporting Local Sustainable Living Initiatives	15 (5%)	20 (7%)	95 (31%)	172 (57%)	302
Students Earn Credits Producing Fruits and Vegetables for Culinary Program	16 (5%)	39 (13%)	86 (28%)	161 (53%)	302
Engineers Intern with City Planners Focused on Sustainability	7 (2%)	17 (6%)	68 (23%)	208 (69%)	300

College Invests Money in Sustainability Placements for Students	11 (4%)	33 (11%)	104 (35%)	153 (51%)	301
Students Earn Credits Doing Sustainability Audits for Local Businesses	13 (4%)	29 (10%)	94 (31%)	164 (55%)	300

Internships with sustainable designers was the most popular idea generated by off-campus respondents and considered by on-campus respondents. The next most popular ideas were engineering students interning with city planners that are focused on sustainability and students participating in sustainable transportation research.

Table 16

On-Campus Respondents on Formatting: Question Six

Should there be a required course explaining how your career will be impacted by sustainability?		
Response	Percentage	Count
No.	20%	61
Not sure.	17%	50
Maybe.	40%	120
Definitely.	24%	71
	Total responses:	302

Assessing the results of this question along with comments made in the short answer questions, it appears that students, staff, and faculty feel that sustainability should be infused in existing courses instead of creating new sustainability-focused courses.

Table 17

On-Campus Respondents on Engagement: Question Seven

Should Algonquin strive to stay on the cutting edge of Education for Sustainability?		
Response	Percentage	Count
No.	1%	4
Not sure.	4%	12
Maybe.	25%	77
Definitely.	70%	214
	Total responses:	307

The Algonquin respondents were keen to see the college stay on the cutting edge of education for sustainability.

Table 18

On-Campus Respondents on Engagement: Question Eight

Should Algonquin be prepared to put money towards its commitment to Education for Sustainability?		
Response	Percentage	Count
No.	3%	8
Not sure.	8%	23
Slightly.	29%	90
Definitely.	60%	185
	Total responses:	306

Table 19

On-Campus Respondents on Formatting: Question Nine

Should Algonquin find corporate partners, grants or both to help fund the development and delivery of new sustainability-related programs?		
Response	Percentage	Count
Neither.	3%	8
Corporate partners.	5%	13

Grants.	10%	27
Both.	83%	231
	Total responses:	279

The respondents felt that Algonquin would need to put money into its sustainability commitments but that both grants and corporate partners could supplement this.

Table 20

On-Campus Respondents on Engagement: Question Ten

Should Algonquin faculty have training about how sustainability is affecting their subject area?		
Response	Percentage	Count
No.	2%	6
Not sure.	6%	17
Some should.	49%	137
All should.	43%	122
	Total responses:	282

Most respondents felt that some or all of the faculty should have professional development opportunities related to sustainability.

Results from the On-Campus Survey Short Answer Questions

Five short answer questions were included in the online survey of Algonquin students, staff, and faculty. The answers to each will later be examined separately, but it is possible to extract salient themes from the all the responses combined (see Table 21). This is useful because participants' responses often presented interesting ideas about education for sustainability but were not directly related to the question asked. While two of the questions asked for specific course or program suggestions, the research respondents primarily gave suggestions about how

Algonquin College could educate for sustainability and not what new/modified courses/programs should be offered. Tables 22 – 25 begin with the survey question and the number of people that chose to respond to it. The trends in the responses are listed beginning with the most common.

Table 21

Themes From On-Campus Short-Answer Responses When Assessed Collectively

Theme	Number of mentions
Sustainability should be threaded through all or most existing curricula.	28
Students should have hands-on experiences with implementing sustainable practices.	23
There should be more sustainability dialogue on Algonquin campuses.	21
There are ample opportunities already to learn about sustainability. (Nine of these participants indicated they were not from Woodroffe campus.)	20
Algonquin should model better waste management practices.	18
Algonquin should require students to use less paper.	16
Students' sustainability-related assignments should be used by the college.	14
Algonquin should use and/or teach renewable energy.	13
Algonquin should provide and/or teach about sustainable food.	11
Algonquin should offer a sustainable lifestyles course.	11
Algonquin should offer courses on industry-specific best practices for sustainability.	10
Algonquin should involve students in research about sustainable practices and technologies.	9
Algonquin should teach about connections between health and sustainability.	9
Algonquin should have a composting program.	9
Algonquin should promote sustainable water policies such as a bottled water ban.	7
Students in many fields could benefit from learning sustainable business practices.	7
Education for sustainability should be optional.	6
Algonquin's Culinary Management program should strive to be more sustainable.	6

Algonquin should strive to make more links to sustainability in the Social Services Worker program.	5
Algonquin should have sustainability as a theme during Orientation Week.	5
Algonquin should broaden the range of sustainability-related issues discussed in the Forestry program.	4
Algonquin should facilitate more sustainability-related volunteer opportunities.	4
Algonquin should provide incentives for attending sustainability workshops or contributing to campus sustainability initiatives.	4
In discussing sustainability Algonquin should acknowledge diverse approaches.	3
Algonquin should teach general workplace sustainability practices.	3
Algonquin should source materials locally whenever possible.	3
Students should learn about sustainability by auditing campus operations.	3
Algonquin should teach about the politics of sustainability.	3
Algonquin should host sustainability innovation competitions.	3
Algonquin should make connections between sustainability and the work of Computer Systems Technicians.	3
Algonquin should make connections between sustainability and the work of horticulturalists.	3
Algonquin should make connections between sustainability and the work of Civil Engineering students.	3

Table 22

Themes From On-Campus Short-Answer Question One

“If you think that a course on sustainability in your particular field would be an asset to your experience at Algonquin then write your program or your idea here”.	
Total responses: 73	
Theme	Number of mentions
-such a course already exists	8 (6 of them not from Woodroffe campus)
-students in health or nursing should have the opportunity to learn more about sustainability	7
-students in the building trades should learn best practices for sustainability	6 (several students volunteered that they were in Heritage Carpentry, Heritage Masonry, or Advanced Housing)
-students in the business programs should have the opportunity to learn more about sustainability	4 (this included a Green Business student who wanted to be learning more about sustainability)
-create a course on sustainable lifestyles	4 (specifically mentioned learning to reduce waste)
-learning about sustainability should be optional	4
-sustainability should be integrated into existing curricula	4
-Social Service Worker students should have the opportunity to learn more about sustainability	3
-Computer System Technician students should have the opportunity to learn more about sustainability	3
-marketing students should have the opportunity to learn more about sustainability	2
-Personal Support Worker students should have the opportunity to learn more about sustainability	2
-students should have the opportunity to learn general sustainable practices for the workplace	2
-students should have the opportunity to learn about sustainable food production	2

Table 23

Themes From On-Campus Short-Answer Question Two

“Can you suggest ways that students could learn about sustainability in their programs while actually making Algonquin a more sustainable place?”	
Total responses: 111	
Theme	Number of mentions
-in order to be able to act on their knowledge about sustainability, students need to have hands-on or in-field experience with applying sustainable principles	18
-there should be more dialogue on campus	15 (some specified that it should happen both inside and outside the classroom, their examples were using ACCE as a talking point, creating “Learning Sustainability Journals”, facilitating student-led focus groups/projects)
-students should work on projects that will actually be used by the college	14 (some stated this would enhance both efficiency and feelings of community, i.e. producing required products (such as plants), helping to design and build new campus buildings)
-sustainability should be infused into existing curriculum	13
-Algonquin should model better waste reduction or waste management strategies	8 (5 of them wanted to see composting on campus)
-Algonquin should use and promote renewable energy	7
-more presentations and workshops about sustainability	7
-more opportunities to learn about best practices in various industries	6

-Algonquin should move towards paperless operations	6
-Algonquin should support sustainable food producers	5
-more sustainability-related research/innovation	5
-more sustainability-related volunteer opportunities	4
-a sustainability emphasis within orientation week	3
-competitions to come up with viable sustainable solutions to real-world challenges	3
-there are sufficient existing opportunities for students to be involved in implementing sustainability	3
-conducting sustainability audits or studying issues on behalf of the college	3
-there should be a focus on sustainable water usage	2

Table 24

Themes From On-Campus Short-Answer Question Three

“Do you have ideas for modifications to existing courses or programs to make them sustainability-related?”

Total responses: 65

Theme	Number of mentions
-include sustainability in existing curriculum	10 (respondents felt this was important but could not suggest specifically how it should be done)
-modify courses so that less paper is used	8
-programs should strive to generate less waste	4 (several mentioned that more effort could be made to re-use building materials)

-sustainability should be learned through hands-on experiences	4
-in-field experiences are especially relevant for those in the various building trades programs	4
-learning their specific industry's new best practices	4
-sustainability is already being addressed either in their program or on their campus	4
-more sustainable practices could be modeled in the culinary program	3 (they cited examples of using local food or composting)
-explore the diverse approaches to sustainability in their industry	3
-dialogue as a means to incorporate sustainability into existing courses	2

Table 25

Themes From On-Campus Short-Answer Question Four

"Do you have ideas for new courses or programs related to sustainability?"	
Total responses: 54	
Theme	Number of Mentions
-a course explaining how everyday actions relate to sustainability	6 (several people referred to an interest in understanding how everything is connected and how sustainable lifestyle choices make a difference)
-already enough sustainability-related course or program offerings	3 (these respondents indicated that they were not from the Woodroffe campus)
-renewable energy	2
-renewable resources management	2

-sustainable business	2
-sustainable agriculture	2
-implementation of sustainability as research	2
-professional development for faculty	2

The fifth and final short-answer question was an invitation to comment on the survey. Thirty-nine participants responded to this question. Of these, 20 people said, thanks, great survey or good luck, denoting considerable enthusiasm about the subject and, likely, an emotional response to the positive tone of the survey questions. Six people took the opportunity to assert that Algonquin needs more sustainability dialogue. Three respondents suggested that Algonquin should provide the opportunity for people to compost on campus, one of whom stated that the nearby Canada Post head office has a composting program.

Results of the Program Recommendation Committee Meeting

The program design phase of the thesis was constructed in the following manner. Initially I had hoped to design new curriculum within this thesis project with the involvement of a team of interested members from the Algonquin College community. The administrative staff responsible for academic development felt that since obtaining official approval for curriculum development was a lengthy process and since they prefer to oversee such initiatives directly themselves, program recommendation was as far as this research was permitted to go. As the needs analysis had been an involved process, I agreed that curriculum development would not fit in the timeline.

The Program Recommendation Committee met for half a day and members were briefed on the survey results as well as trends in education for sustainability at Canadian and US colleges as discovered in the review described in Chapter Two. While 41% of survey respondents said

yes or maybe when asked if they would like to be a part of this committee and the event was advertised on the college website and via emails, in the end only eight people participated.

Those participating were primarily staff with a few professors and one student. I had planned to do an interview matrix to get everyone's ideas out in the open but with so few people I ended up just encouraging discussion around a few key questions. The Program Recommendation Committee discussion questions were:

1. What new sustainability-related courses/programs should Algonquin offer?
2. What are some practical ways that the curriculum can foster an understanding of the interconnection between economy, ecology and society?
3. What should be Algonquin College's priorities at this time in order to develop its leadership in education for sustainability?

Collectively, the participants had strong feelings about embedding sustainability in existing curricula and no strong feelings about any new programs. Some participants were critical of programs specifically devoted to sustainability saying that in five years this subject will be integrated and not be a specialized field. They therefore felt that it would be progressive and less work to infuse sustainability across Algonquin curricula now. There was a general agreement about the fact that distinct streams of architecture or business devoted to sustainability marginalized the issue making it a special interest or fringe practice. Separate sustainability-focused streams were seen to make the issue the responsibility of a few, not all. It appeared that this group felt that all programs should mandate and mainstream new sustainability-related best practices.

The group supported the idea of sustainable infrastructure change as indirect teaching and the creation of a feeling of being a sustainability-minded college. It was suggested that this be

accomplished through marketing the idea that “this is how we do things around here”.

Correspondingly it was suggested that college staff collaborate by using common language, raising awareness, making connections to real world events, and connecting the dots so people understand how decisions affect society, economy, and ecology. To these ends it was suggested that there be professional development opportunities and general education electives but no new programs. When pressed for ideas of new programs of study, the group suggested renewable energy foremost and then technology, conservation, economic expediency of sustainable business practices and a general education course.

There were also many suggestions regarding the untapped resource represented by the sustainability-related ideas and information that staff, faculty, and students are not presently sharing with each other. It was suggested that within the college people could leverage each others’ talents and network to support good ideas, thereby creatively using college resources for sustainability initiatives. Participants stressed that the case should be made that addressing sustainability need not be expensive and can often generate savings for the college and/or increased enrolment. Innovation could also make the college more sustainable, raise its profile as a sustainable school and save money; this is holistic as it addresses all three pillars of sustainability. An example given was finding the profitability in wastewater (something that other colleges are doing).

There is a current initiative in the college wherein sustainability is being made a graded learning requirement in every course; however, this process will take a long time and not involve those with expertise in education for sustainability. The committee discussed the fact that due to arbitrary circumstances most students seem to be aware of sustainability on the Perth campus. It was suggested that there is a dedicated faculty member at that campus who fuels sustainability

discourse on campus and fosters a sense of being involved in a sustainability-focused institution. As the committee was formed from the Woodroffe campus where the dominant programs are nursing, technology, and business, the committee members in this study talked mostly about those programs. It was suggested that there be an effort to create dialogue about how sustainability is related to those fields.

In summary, the biggest themes arising from the committee were legitimizing the sustainability agenda, proving it to be economically viable, mandating best practices, and providing sustainability-focused professional development. It was thought that there should be a positive, common approach to talking about sustainability and support provided to the sustainability-related ideas generated by students, staff, and faculty. Also, building sustainability into college operations would be instructive for staff and students alike. There are already sustainability initiatives at the college that should be talked about more. There are also many existing resources that could support sustainability initiatives. Committee participants mentioned that there could be incentives for staff to participate in sustainability initiatives because as it stands only a handful of people are engaged in sustainability issues at Algonquin. It was mentioned that SASC is not very visible, inviting, or active. Participants suggested that there could be sub-committees or separate committees to use the resources inherent in other community members' enthusiasm and creativity. The group also said that the Students' Association should be involved in creating the dialogue implying that it represents an ally awaiting engagement.

Chapter Five: Discussion and Conclusions

One of the research questions addressed by this research was, “What are the college’s strengths, weaknesses, opportunities and challenges [or threats] in creating curriculum that prepares students to support sustainability in their careers?” This question is addressed at the beginning of this final chapter and a discussion of the other research questions will follow. The last section of this chapter will include groupings of recommendations for Algonquin College to set in motion a strategic new phase in its mission to provide education for sustainability.

Algonquin’s Strengths in Providing Education for Sustainability

Algonquin was an early adopter of sustainable principles as evidenced by their signing of national and international protocols. The college readily champions sustainability and takes pride in its Sustainability Speaker Series and its See Earth program. Algonquin’s sustainability white paper and the best practices report reflect holistic and progressive thinking. There is also a lot of “green” buzz around the opening of the Algonquin Centre for Construction Excellence this fall. It is commendable that all the new Algonquin buildings will be LEED certified. Existing environmentally focused curricula also put Algonquin on the map. This is especially the case with the Green Business Program because it was the first of its kind in Canada.

A significant strength of Algonquin College in providing education for sustainability is the fact that many staff and faculty have a personal passion for the environment and sustainability. This is non-quantifiable and it was beyond the scope of this research to gather narratives and testimonies regarding Algonquin employees’ contributions to sustainability dialogue and sustainable curriculum development. However, throughout the research it was a pleasure to encounter faculty and staff in various departments who were very enthusiastic about this thesis topic and about Algonquin being a sustainability leader. Not only do these people

represent enthusiasm, they represent a wealth of knowledge about sustainability as it relates to myriad important issues that are taught or experienced on campus. Another strength is that these staff and faculty would likely enjoy sharing their expertise in formal and informal ways during their work hours if they were encouraged to do so. In other words, a more participatory, sustainable organizational culture would not have to be created, but simply encouraged. The research results show abundant support for sustainability and many original ideas for new initiatives.

Algonquin's Weaknesses in Providing Education for Sustainability

I observed a culture among Algonquin employees where people were proud of their overtime hours and overwork was perceived as heroic. This is antithetical to social sustainability. A sustainable society has as foci health, well being, and balance on a personal level; ample attention paid to relationships with family and community; and investments of time and energy in collaborative community projects. This leads to another weakness at Algonquin, which is its lack of community participation in sustainability initiatives. Actualizing sustainability cannot happen through attending events but it does happen when people roll up their sleeves and have enjoyable experiences while changing unsustainable behaviours. Algonquin's weaknesses in education for sustainability are seen in the lack of engagement by the sustainability-focused staff mentioned above and the absence of student representation in SASC and other committees. Other weakness are reflected by 62% of students in the Clipboard Survey saying they had not learned about sustainability in their programs and none of them using the three pillars in defining sustainability.

Algonquin appears to be stalled in its commitment to infuse sustainability in the curriculum because it mistakenly assumes that this will require expensive, extensive resources.

The reality may be that community partners, corporate partners, Algonquin students, staff, and faculty will provide ideas, support, and action once the college administration creates the space for new possibilities. These “free” resources will require modest investments by Algonquin in the form of one or more dedicated staff, administrative support for organically emerging projects, and professional development to raise the level of knowledge and buy-in across the college. Currently there is a bureaucratic and exclusive feel to college sustainability initiatives that undermines both their legitimacy and potential. Little has been done since 2009 to advance Algonquin’s sustainability goals due to these weaknesses in the college’s approach.

The last series of weaknesses has to do with public relations and communications. The SASC webpage does not list or link to sustainability-related curricula nor does it list many of the college’s sustainability-related achievements. Ninety-two percent of Algonquin online survey respondents said that the website should have a page compiling information about current programs and courses related to sustainability as well as new sustainability-related curricula being developed. This is needed because eleven research respondents said there should be elective courses regarding sustainable lifestyles indicating they did not know such courses already exist. Currently most sustainability-related content on the website covers only Algonquin’s intentions with regards to sustainability and not its implementation and evaluation plans. Furthermore, many references to sustainability throughout the website reveal a limited understanding of the concept. This is especially problematic with regards to Algonquin’s strategic plan. The President’s Executive Committee, which reviewed the college documents mentioned in this report, is clearly at a loss as to how to use sustainability as a guiding principle for the college. Sustainability is barely mentioned in strategic planning documents and is essentially an afterthought or just mentioned as required contemporary jargon.

Algonquin's Opportunities in Providing Education for Sustainability

The previous critique segues nicely into Algonquin's opportunities in providing education for sustainability. The position of the college administration is understandable because it faces a globally acknowledged conundrum: how to continue being successful whilst undergoing unpredictable, fundamental transformation. Yet this is what must happen. The sustainability white paper states that, "we must undergo a paradigm shift in our culture, attitudes and behaviours" (Aubut et al., 2009). This is an incredible opportunity to revitalize the college's self-image and keep Algonquin's status amongst national leaders in college education. Institutional transformation is required to meet the stated sustainability goals.

The white paper, more than any other document, gives a detailed explanation of how to move forward, representing an opportunity in the form of plans ready for implementation. As is stated in the white paper, the four key college values: learning, caring, integrity, and respect, applied to action for sustainability, represent a way to use existing strengths to make a meaningful culture of participation in actualizing sustainability. For instance student-led groups can develop concrete solutions for how college purchasing policies can expand the accordance of respect and care beyond individuals to the communities and systems that support individuals. This may take the form of fair-trade clothing, local artwork, or restored furniture because these products are connected to resilient economies and the provision of socially-meaningful employment. Other concrete, extra-curricular opportunities could also stem from student-led committees using the four values and the sustainability strategy to identify, plan, execute, and evaluate Algonquin-appropriate initiatives.

The dialogue has begun and while action is required, these early community-wide conversations are critically important and represent an opportunity for widespread involvement

with the sustainability agenda. There is no roadmap for implementing sustainability. Each institution charts its own voyage and community involvement helps to actualize social sustainability. There is an opportunity here for sustainable thought and practices to become second nature to everyone in the Algonquin community; public relations highlighting sustainable operations combined with infusion of sustainability across the curriculum will make sustainability a genuine part of the college's character. There is an opportunity to build a culture of sustainability that is uniquely Algonquin and broadly engaging of stakeholders on and off campus. A concrete way to do this would be for a student-led initiative to offer tours to any Ottawans interested in the sustainable features of the new ACCE building.

As experiential education is a huge sustainability-related trend the college would do well to create more co-op programs and apprenticeships wherein students can get experience implementing sustainable technologies or practices. Survey respondents especially liked the idea of the college facilitating opportunities for design students to learn from sustainability-focused designers. Respondents also supported the idea of engineering students learning alongside city planners who are focused on sustainability. Eighty-three percent of on-campus online respondents thought Algonquin should pursue both grants and corporate partnerships in order to expand its sustainability-related program offerings indicating a belief that the money is out there if Algonquin focuses on seeking and building relationships with sponsors. Off-campus partners represent a huge opportunity in terms of vision, funding, and other resources. This relates to co-ops and also applied research, something else Algonquin is already doing well.

The college has the opportunity to redouble efforts to work with stakeholders in pioneering research into new best practices or innovative technologies for sustainability. Applied Research and Innovation at Algonquin could focus primarily on sustainability projects

in 2012 and advertise broadly to see what new partners come along. Survey respondents wanted to see research done on transportation issues as well as renewable energy and waste management. Most of the North American sustainability-focused college programs at other institutions and described in this thesis are less than five years old. There is a wave of innovation in education that is taking place now and Algonquin can capitalize on the synergy and momentum. A concrete way to do this would be to encourage the formation of a student-led group that signs Algonquin up with STARS, studies the various sustainability initiatives that could happen, and then chooses appropriate projects that they themselves can lead.

Other opportunities are inherent in the expertise of various Algonquin programs that can be built upon by emphasizing new best practices for sustainability. For instance, the Program Recommendation Committee suggested that the college's School of Business could become expert in making the business case for sustainability and educating about the efficiency of sustainable practices. The discussion of economic sustainability could become even more meaningful if it went beyond projections of financial returns in the existing economy and entertained public forums on an alternative, no-growth national economy such as the one described by Jackson (2009). A related idea would be for the School of Media and Design to entertain dialogue about the lifestyles being marketed and how more sustainable ideals could infiltrate media and other public spaces.

Professional development for faculty to learn how to facilitate discussions of sustainability would ensure space for critical thought and the learning of skills for actualizing sustainability, such as systems thinking. Ninety-two percent of on-campus online respondents said some or all of the faculty should have access to sustainability-focused professional development. This should begin immediately and does not need to correspond to learning

outcomes, as it is more about attitude and new mental models. Post-secondary institutions, like all educational organizations, should provide the opportunity for students to learn how to think, not what to think. Therefore faculty need not become expert in sustainability generally or as it relates to their subjects, they need only be comfortable opening the floor to the pre-existing knowledge within their classrooms and teaching students various ways of thinking. The opportunity is for an airing of perspectives and possibilities as they relate to sustainability and given the ideal of value pluralism, there need not be a quest for right answers but rather a space where all ideas are respected. Lastly, each program at Algonquin represents an opportunity to expand sustainable best practices for that specific field. Algonquin could become a leader in, for example, sustainable healthcare, sustainable transportation, or sustainable cuisine. Leadership in these areas would really set Algonquin apart and support Ottawa, Pembroke, and Perth in becoming more sustainable communities.

Another specific opportunity is involving Business Administration students in a study of how Algonquin programs can become more economically viable and more sustainable simultaneously. For example, Algonquin's strategic planning document (Algonquin College, 2010b) implies that the Culinary Program is not economically sustainable and several research respondents indicated that a significant amount of food is wasted. Many research respondents also mentioned composting which could be a cost-saving or revenue-generating project. A holistic approach could guide the revamping of this program, corresponding with the ethical food trend. This is an example only and the search for the economic, social, and ecological benefits of implementing sustainable practices could take infinitely different forms. There are also myriad ways to encourage this process.

Faculty in various departments could encourage students to focus their assignments on the benefits to Algonquin of becoming more sustainable. Students and faculty could even potentially research, implement, and maintain projects on an ongoing basis. Algonquin need only harness the energy and creativity of its community members in order to make leaps and bounds towards sustainability. Also, Shriberg and Tallent (2003) advised colleges to dismantle systemic barriers to cooperation between departments so as to achieve the goal of providing more interdisciplinary studies. Committees could be formed to brainstorm unique new interdisciplinary programs that could make Algonquin graduates fill important niches in actualizing sustainability in their communities. Other committees could gather staff and faculty input on how to infuse sustainability across the existing curriculum; this work should gather input as broadly as possible and emphasize a variety of approaches to social, ecological, and economic sustainability.

A final opportunity lies in the use of permaculture philosophy as a framework for teaching new or modified curricula relating to sustainability. This was suggested by off-campus respondents. Permaculture philosophy is akin to systems thinking applied to the design of communities, and it even covers the interior design of buildings, something Algonquin already teaches. In permaculture, all waste is cycled through the system, water is carefully managed, building supplies are locally-sourced, spaces are designed for community interaction, and forest gardens maximize food production in small spaces. It would quickly become a source of interest to the growing, international permaculture community were Algonquin to offer this sort of innovative training in the forms of both general and specialized diplomas. There are many faculty members, community partners, and corporate sponsors that would support this type of program development, including Transition Ottawa and Transition Perth.

Algonquin's Threats in Providing Education for Sustainability

The biggest threat facing Algonquin is the notion that sustainability can be achieved through the current, slow-moving, bureaucratic approach. Said differently, the threat is an unwillingness to change its structures and processes, clinging to the illusion that sustainability can be adequately addressed without involving the community in an organic transformation. Another threat is resting on laurels, a phenomenon evidenced by staff members still commending the college for simply signing Talloires, four years ago. Although intentions have been articulated, however, a considerable threat is represented by the lack of a detailed implementation plan with responsibility assigned to diverse types of community members. An implementation plan would necessitate the commitment of resources and the broad engagement of the community but more critically it requires a leap of faith. A huge threat is that the administration is overwhelmed by the outside-the-box nature of the challenge, the required and unfamiliar decentralization of power, and the unleashing of an organic, living, unpredictable social movement within Algonquin's walls. This is completely understandable. But, critically, the nature of the threat is not the enormity of the task but the relinquishing of outdated mental models. Overcoming this was alluded to in Chapter Two when Senge's ideas were presented regarding organizations that adapt and thrive in a rapidly changing world (Smith, 2001).

This brings us back to the beginning of the literature review and the discussion of values. We have been educated to over-simplify, categorize, and separate phenomena in a way that prevents us from wholly understanding them. We have internalized ideas of human superiority, competition, and individualism. This is evident in college marketing strategies that mimic those in the media generally where a narrow, self-serving notion of prosperity is held aloft. These represent absolute threats to sustainability. There must be a shift in our minds and our

institutions whereby models of collaboration and the well being of social, economic, and ecological systems become paramount. Algonquin, by ignoring this fact, creates a threat to its well being and its legitimacy in claiming to be a leader in education for sustainability.

For their part, the faculty members also need to experience this shift and embody it in pedagogical practices. In the information age, instructors are not purveyors of knowledge so much as facilitators of learning. To this end, faculty must become comfortable in seeing themselves as lifelong learners and as facilitators of unpredictable conversations. Not employing sustainability-related pedagogical practices represents the threat of inadequately preparing students for today's world. One aspect of this change in the classroom is transcending the detached stance; sustainability demands our acknowledgement of the fact that everything is connected. It is a threat to Algonquin if any staff, faculty, or students feel that they are not a part of actualizing sustainability. Likewise, if any stakeholders feel that sustainability is "someone else's problem", busting that myth should be a top priority. This was all covered by the Talloires Declaration in 1990 and does not represent any new ideas. However, in signing Talloires, Algonquin signed up for radical or fundamental transformation.

It would be a threat to the college, were it to underestimate the fundamental nature of the change or the brilliant outcomes that such a change can facilitate. Therefore there needs to be a reconciliation of the sustainability agenda and the strategic plan before another year yields as little progress as did 2010 for education for sustainability at Algonquin. The leap of faith resides in humbly and gracefully democratizing the process via community dialogue and the mobilization of support for the popular ideas that arise. There are student visionaries wandering the campus, businesses looking to collaborate, and staff members wishing they could bring to

work their passion for sustainability. The threat lays in not creating space for the Algonquin community to find its own unique path to sustainability.

Discussion of Remaining Research Questions

Some of the research questions have been answered in other sections of the thesis (see Table 26). The remaining questions, that require the researcher's analysis, will be discussed briefly in this section.

Table 26

Research Questions Answered In Other Thesis Chapters

Research question	Where responses can be found in the thesis
What curriculum currently exists at Algonquin College to prepare students to support sustainability in their careers?	In Chapter 2 there is a section entitled Institutions of Higher Learning and Sustainability and a subsection entitled Education for Sustainability at Algonquin Today.
What roles do Algonquin faculty, staff, and students see Algonquin College playing now or potentially in the future regarding student preparation to support sustainability in their careers?	In Chapter 4 there are sections entitled Results of the Clipboard Survey and Results of the On-Campus Survey.
What roles do community stakeholder organizations such as Transition Ottawa see Algonquin College playing now or potentially in the future regarding the preparation of students to support sustainability in their careers?	In Chapter 4 there is a section entitled Results of the Off-Campus Survey.

The following three research questions should be used on an ongoing basis by the college in order to keep abreast of education for sustainability and not re-invent the wheel in its academic development.

1. Are there exemplary North American college curricula that are seen as models for preparing students to support sustainability in their careers?

2. Do these exemplary curricula have characteristics that might be applied as design criteria for course/program revision/development by Algonquin College?
3. What design specifications can be developed to guide new curriculum development or curriculum revisions related to preparing students to support sustainability in their careers?

The most critical point is that the research results indicated a strong preference for infusing sustainability concepts into existing curriculum rather than developing new sustainability-focused curricula. Therefore, Algonquin should make a study of the approaches to infusion used by the colleges claiming to be addressing sustainability in this manner. Table 6 in Chapter Two provided examples of colleges formatting programs to better address sustainability. Though these colleges may not have explicit protocols or philosophies regarding infusion, Algonquin could still learn from their experiences with new types of education for sustainability. In the interim before curricula be reviewed, faculty can be briefed, and new programs can be developed, the immediate focus should be on creating dialogue in classrooms and fostering an awareness of the omnipresent implications of sustainability. The college should market the fact that it is questioning its own practices as required by sustainability and that this self-awareness is an integral part of a 21st century education. Students and faculty alike need support in adopting the paradigm wherein everything is connected and everyone has a role to play in addressing sustainability.

Given that research respondents wanted to see existing programs taught through the lens of sustainability, the following lessons from other colleges would be helpful for Algonquin. First, the college should expand its provision of co-op placements for students by creating a series of sustainability-related opportunities for students to simultaneously learn about and

contribute to sustainability. Second, Algonquin should reduce logistical barriers to experiential learning or service learning and should create incentives for courses to be revised so as to include such opportunities. Third, civic engagement should be systematically encouraged because it is absolutely necessary for social sustainability. Fourth, it would surely pay for itself were Algonquin to make a concerted effort to continually seek new, collaborative, sustainability-focused relationships with businesses, governments, and community groups.

The final research question to be discussed is: Should Algonquin strive to remain a sustainability leader? None of the off-campus respondents disagreed with the importance of this goal, nor did the clipboard survey respondents. Ninety-nine percent of the on-campus respondents did not disagree that Algonquin should strive to remain a sustainability leader. It can therefore be said that the 373 research participants almost unanimously believed that Algonquin should continue to put considerable time, energy, and resources towards its sustainability goals. All the diverse and innovative programs being offered by other North American colleges serve to show that addressing sustainability is a huge trend that is growing quickly. Algonquin currently does not compare to other Ontario colleges in terms of sustainability leadership. Fleming College and Georgian College lead the way in embodying their sustainability commitments and delivering education for sustainability. Algonquin would do well to carve out its own niche and create more of its own sustainability-related specialties as it has begun to do by creating the Green Business program.

A Renewed Approach to Education for Sustainability at Algonquin

It has been a privilege to become privy to the details of Algonquin's journey towards sustainability and to cooperate with Algonquin staff in the creation of this thesis. It is to be hoped that the accounts of other colleges' inspirational initiatives and the feedback from the 373

research participants are helpful as Algonquin continues to operationalize its plans to educate for sustainability. The following is a list of what I feel would most powerfully expand Algonquin's capacity to turn out graduates who are ready and willing to address sustainability in their life and work.

1. "Algonquin is dedicated to being increasingly more sustainable as an institution and there are always ways for students to become involved." This is the message that should resound constantly throughout the campuses. Bringing sustainability-related content into classrooms will be much more powerful if sustainability is widely believed to be a part of "the Algonquin experience" and the way of the future. Sustainability cannot be learned without actually feeling oneself to be a part of its implementation.

2. Social and economic sustainability should be highlighted and explored whenever possible. This could happen through discussions of the democratizing effect of social media, the incompatibility of consumerism and sustainability, or the global movement to create localized, resilient economies. Algonquin needs to tackle the challenge of genuinely engaging with all three pillars of sustainability. Part of this could be creating a plan to ensure graduates are devoted to lifelong civic engagement and have an awareness of new economic paradigms.

3. The culture of overwork must be replaced by a culture wherein staff and faculty devote time to committees that include students and that could work to share knowledge, experiences, and perspectives of sustainable practices for home and work; consider how implementing sustainability can help with other college goals; research success stories of sustainability being infused in college curricula; research ways that community groups could be involved in education for sustainability and seek out ideal new partners; and choose appropriate sustainability projects for Algonquin and then create implementation and evaluation plans.

These committees could use human resources wisely by offering appropriate compensation supplied by off-campus partners. Committees could have an open-minded administrator overseeing them to ensure ethical, efficient, and well-supported initiatives.

4. Create the capacity to supervise new off-campus curriculum development and collaborate with diverse, new partners. Advertise broadly that the college is seeking new partners to fund and co-create education for sustainability. Choose new programs wisely from a broad spectrum of choices. Devote extra attention to the unique factors that will bring success to new and modified program offerings related to sustainability. Market education for sustainability to new, international audiences.

5. Frame sustainability as an opportunity, as an issue that can unite communities, and as integral to life in the 21st century. Publicly critique issues such as sustainability as a special interest; healthy lifestyles as a special interest; money bringing happiness; charity as social justice; security needing precedence over sustainability; sustainability interfering with economic gain; sustainability being incompatible with technology; sustainability being “fixed” solely by technology; globalized economies being sustainable; current sustainability initiatives being adequate; and certain people being unaffected by sustainability. Identify and discredit beliefs that are antithetical to sustainability. Be conscious of the values embedded in words and actions. Foster an awareness of the mental models and paradigms that are compatible with the actualization of sustainability.

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Appendix A

Survey Questions

Online Off-Campus Survey Questions

What careers (and corresponding college education and programming) would make our society more sustainable?

What curriculum (courses/programs) could Algonquin College provide to prepare students to support sustainability in their careers?

In preparing students to support sustainability in their careers are you aware of any of Algonquin College's unique strengths, weaknesses, opportunities or challenges?

Could combining skills and knowledge from diverse program areas make Algonquin graduates into Sustainability Specialists? If so, how?

How can Algonquin work with community partners to prepare students to support sustainability in their careers?

Should Algonquin strive to become a Sustainability Specialist (defined as aiming to have all programs preparing students to support sustainability in their chosen careers)? What would be the benefits of this?

Are you a member of Transition Ottawa or the general public?

Clipboard Survey Questions

Your Age: Program(s) in which you are currently enrolled:

Degree, Certificate, or Diploma goal:

How many semesters/years have you attended Algonquin to date?

Main reason for enrolling at Algonquin College:

Given that sustainability is an ambiguous term, how would you define it or what does it mean to you?

In your program do you learn about sustainability? Is there more of a focus on the social, economic or environmental aspects of sustainability?

Would you have ideas for how to support sustainability on your career path? If so, please share them here.

Do you think that people in all fields should learn about sustainability or just some? Explain your answer.

Online On-Campus Survey Questions

To complete this survey you must be 18 or over and a member of the Algonquin College community. Are you: a student, staff or faculty?

Are you at: Woodroffe campus? Pembroke campus? Perth campus?

Do you have an interest in sustainability? No. Not sure. Somewhat. Definitely.

Should Algonquin have off-campus community partners to help students learn about new trends in sustainability in the workplace? No. Not sure. Maybe. Definitely.

Do you think that there should be more electives at Algonquin that teach about sustainability? No. Not sure. Yes, how to be sustainable in my personal life. Yes, how to be sustainable in my career. Yes, both types of courses.

The following are some new sustainability-focused programs that other Canadian colleges are developing. Do you think Algonquin should have similar programs?

	No	No sure	Maybe	Definitely
Ecotourism				
Sustainable Hospitality				
Renewable Resources Management				
Landscape Architectural Technology				
Resource and Environmental Law				
First Nations Land Stewardship				
Environmental Engineering				
Ecological Restoration				
Sustainable Agriculture				
Renewable Energy (Wind and Solar)				
Urban and Rural Planning				

Should the Algonquin website have a page explaining current programs and courses related to sustainability as well as new sustainability-related curriculum being developed? No. Not sure. Yes, I didn't know about Algonquin's commitment to sustainability. Yes, it would be good to know more about Algonquin's commitment to sustainability.

Throughout March as a part of this research project residents of Ottawa provided ideas about

Education for Sustainability at Algonquin College. Please indicate if you like their ideas.

	No	Not sure	Maybe	Definitely
Media Students Get Credits Promoting Community Sustainability Initiatives				
Internships with Sustainable Designers (of products, home or landscapes)				
Students Participate in Sustainable Transportation Research Projects				
Students Earn Credits Supporting Local Sustainable Living Initiatives				
Students Earn Credits Producing Fruits and Vegetables for Culinary Program				
Engineers Intern with City Planners Focused on Sustainability				
College Invests Money in Sustainability Placements for Students				
Students Earn Credits Doing Sustainability Audits for Local Businesses				

Should there be a required course explaining how your career will be impacted by sustainability?
No. Not sure. Maybe. Definitely.

If you think that a course on sustainability in your particular field would be an asset to your experience at Algonquin then write your program or your idea here.

Should Algonquin strive to stay on the cutting edge of Education for Sustainability? No. Not sure. Maybe. Definitely.

Should Algonquin be prepared to put money towards its commitment to Education for Sustainability? No. Not sure. Slightly. Definitely.

Can you suggest ways that students could learn about sustainability in their programs while actually making Algonquin a more sustainable place?

Should Algonquin find corporate partners, grants, or both to help fund the development and delivery of new sustainability-related programs? Neither. Corporate partners. Grants. Both.

Should Algonquin faculty have training about how sustainability is affecting their subject area?
No. Not sure. Some should. All should.

Do you have ideas for modifications to existing courses or programs to make them sustainability-related?

Do you have ideas for new courses or programs related to sustainability?

A committee will meet May 20, 2011 to hear the anonymous survey results and learn more about what other colleges are doing to address sustainability. Then the committee will develop recommendations for Algonquin regarding the new programs/courses that the College could offer. Would you like to be a part of this committee? No. Maybe. Yes, and I'm a student. Yes, and I'm staff. Yes, and I'm faculty.

Comments on this survey are welcome here.

Appendix B

Addendum to the Observations of Education for Sustainability

In Chapter 2, observations of current trends in education for sustainability were condensed into tables. The purposes of this appendix are to highlight less-explored types of education for sustainability and extra-curricular education for sustainability as well as to illustrate the connections between education for sustainability and social justice. The less-explored sustainability-focused programs may be the best types for Algonquin to offer because they are unique and capitalize on the college's existing strengths. The extra-curricular initiatives are important as they can foster engagement with sustainability as opposed to studying it in a detached manner. Also, students can potentially learn as much about sustainability through extra-curricular activities as through their studies. The social justice implications of the following curricular trends in North American colleges did not fit into the thesis review of the literature. These considerations could provoke interesting discussions on campus and demonstrate the holistic vision of sustainability.

Social Justice Implications of Sustainable Food

The UN has recently stated that for there to be sustainable global food production, there must be a focus on resilient local food systems (Evans, 2011). Examples were given in this thesis of colleges collaborating with community groups to strengthen local food systems. Whereas agriculture is traditionally not a lucrative career option, legions of responsible consumers are changing the face of agriculture through their willingness to pay more for local, ethical, and/or organic food. Agriculture employs a large percentage of US workers but according to the National Agricultural Workers Survey, in 2001-2002, most US farmworkers were illegal and had no recourse regarding poor labour conditions (Schrek, 2006, p. 441). This could not occur in a

sustainable agriculture model, illustrating one social justice dimension of colleges addressing sustainable food. Colleges can create an awareness of the need for a living wage and fair working conditions for farmers everywhere. Sustainability may require a reappraisal of the percentages of household spending allocated to novelty and necessity. Food prices must rise because they are currently too low for farmers to be fairly compensated (Cullather, 2011). If we want social justice we may have to pay for it. Recall the discussion of balancing our values in Chapter Two.

Social Justice Implications of Sustainable Design

An important example of the impact of urban planning on sustainability is the provision of green spaces for the multitudes of people in apartments and condos. One study concluded that families with access to public outdoor spaces had twice as many friends (Louv, 2008, p. 51) and having friends is associated with personal and community well being. In recent decades there has been a stark decrease in children playing outside and some researchers link this to marked increases in both childhood obesity and childhood depression (Louv, 2008, p. 49). Better physical design of communities can help with this. Also, if sustainability requires people to be citizens foremost and consumers secondarily (Orr, 2004, p. 32), communities can be designed with fewer impetuses to spend and more space to meaningfully and creatively engage with others. This is especially important for low-income families that are less likely to have access to community green spaces.

Social Justice Implications of Sustainable Law and Policy

Colleges are doing a huge service to society by turning out ecoliterate graduates whose work will be the creation and modification of laws and policies. Without this there would be little hope for a sustainable society. It has traditionally been a downfall of the sustainability

movement that its advocates lobby governments instead of forming governments. Clearly creating sustainable policies is also important for private and social enterprise in any setting; in a sense, policy-makers are designers too. This field gets really exciting when social justice issues come to the fore such as restoring authority to marginalized groups. In the US, there is a movement to systematically ensure that the most economically vulnerable people benefit from the new, green economy (Green for All, 2011).

Social Justice Implications of Experiential Learning

Researchers (Savanicka, Strong, & Manning, 2008) studied the synergy and efficacy inherent in students' gaining academic credit for designing and carrying out campus sustainability projects. They state that "when done well, this type of local, hands-on, experiential education has the opportunity to improve pedagogy and the success of the project" (Savanicka, Strong, & Manning, 2008, p. 668). There are even more profound benefits as well.

Using the campus as a teaching tool can also be seen as a form of service-learning, an educational method where students participate in an organized community service activity as part of academic learning. Service learning has shown to improve academic learning and student satisfaction (Astin et al. 2000; Eyler et al. 2001; Lui, Philpotts and Gray 2004). Research has also shown that service learning has a positive impact on important educational outcome measures such as critical thinking skills (Eyler, Root and Giles 1998), teamwork and leadership skills (Vogelgesang and Astin 2000), and self-confidence (Astin and Sax 1998). (Savanicka, Strong, & Manning, 2008, p. 668)

More generally, hands-on learning has the potential to enhance education for sustainability by giving students experience with shifting paradigms (Dieleman & Huisinsh, 2006, p. 837) and participating in the modeling of new practices (Lyons Higgs & McMillan, 2006, p. 39). This

implies that students can reprogram themselves to act on social justice and sustainability issues throughout all their activities. It is a participatory experience for the greater good as opposed to doing something for others in a detached manner, without supposed benefits for self. This equalizing experience is relevant to social sustainability and the idea of networks replacing hierarchies. With experiential learning, passivity becomes impossible; students are actualizing sustainability instead of discussing it.

Potential New Types of Education for Sustainability

Addressing sustainable health.

The researcher found that the programs described in Chapter Two were the most popular new sustainability-related curricula in North America though several others deserve mention. In making recommendations for Algonquin, it is prudent to give an eye to the less explored of the up and coming trends in education for sustainability. The first of these trends is health.

In spring semester 2011 the Institute for Sustainability and Post-carbon Education at Bristol Community College in Fall River, Massachusetts will offer an online course titled, “Building Sustainable Health Systems: The Essential Role of Public Health.” The premises of this course are that 1) the structure and content of public health, medicine and nursing will be deeply transformed as society reaches the limits to growth and 2) public health is critical to all socioeconomic localization and community building. The course is designed to allow public health professionals and members of the community to work synergistically and strategically as ecologically mandated social change emerges.

(Bednarz, & Wood, 2011)

The retired president of the University of North Dakota states “colleges and universities should give more broad-based attention to health and wellness—at all levels” (Kupchella, 2009). He

states that Americans are in poor health. However, Canadians are also plagued with preventable diseases. A popular tool for sustainability is systems thinking (Center for Ecoliteracy, 2011b) which in this case prompts one to explore root causes of illness. Using systems thinking to explore health issues requires one to broaden the scope of possible solutions beyond treatment-focused medicine.

A spokesperson from the Royal Society for Public Health makes a good case for simultaneously addressing climate change and health.

Policies that reduce greenhouse gas emissions will result in large health gains, with sizeable reductions in many of the major killers including heart disease, cancer, obesity, diabetes, road deaths and air pollution. For example, consuming less animal products reduces carbon emissions whilst reducing heart disease and stroke; less use of the car and more walking and cycling does the same. Low-carbon societies also offer the prospect of improved quality of life, focusing on the community, self-sufficiency, family, relationships, creativity and contact with nature. All of these are demonstrably good for our health and well-being. What's good for the climate is good for health. (Griffiths, 2010, p. 14)

In the suggestions made by Griffiths there are many entry points for professors and students to engage with sustainability issues by way of research or action projects. Nursing students at Algonquin have led community sustainability projects in the past, which is a good starting point.

Addressing sustainable transportation.

When it comes to sustainable transportation the solutions are still in development and students can play a role. Algonquin does train students in transportation trades and survey respondents suggested that these students conduct research into workable designs for new types

of vehicles. An alternative way to power existing automobiles that is suitable for small-scale (ie. campus) operations is biodiesel. Blackburn College chemistry students are using waste oil from their cafeterias to make several batches of biodiesel each semester (Dettro, 2011), enough to meet campus needs. There are other post-secondary institutions that are using biodiesel on campus too (Principia College, 2011). There is at least one college course in existence that focuses on hybrid and electric vehicles (Hoskins, 2011).

Municipal governments could use students' help in researching and developing sustainable transportation planning.

Commute times in Canadian cities are no longer just a source of rush-hour irritation, but a national liability affecting the economic performance of our urban centres and requiring immediate intervention from Ottawa. A new ranking of international cities by the Toronto Board of Trade saw major Canadian municipalities fall dramatically behind in the realm of transportation and transit. (Agrell, Perreaux, Stueck, & Wingrove, 2011)

The following is an example of students researching sustainable transportation. California Polytechnic San Luis Obispo architecture students made a film exploring how Los Angeles could have a car-free downtown (Merchant, 2011). An article about the film asks, "what if it [the city] were simply organized more intelligently? What if... the whopping 36% of land dedicate [sic] to parking lots was re-appropriated for stuff that's makes [sic] for a healthier society?" (Merchant, 2011). Like the city of Los Angeles, colleges throughout the US are simultaneously experiencing parking crises and trying to address sustainability (Grasgreen, 2011). Algonquin also has parking woes (Tieman, 2011). Some of the transportation strategies being used in US colleges are the selling of discounted bikes and expensive parking passes (Grasgreen, 2011). There are many approaches to facilitating sustainable transportation. Students can help with the

research, design, and perhaps most importantly, marketing of sustainable transportation solutions for the campus and the broader community.

Addressing sustainable waste management.

While Algonquin includes its Water and Wastewater Technician program among its sustainability-related programs, its focus is conventional methods and the program webpage does not mention sustainability (Algonquin College, 2011b). Fleming College, along with community partners, has created the Centre for Alternative Wastewater Treatment (Fleming College, 2011) and in doing so it is part of a wave of innovation. Several US cities are cycling wastewater into sustainable energy and fertilizer (Zimmer, 2011a; Zimmer, 2011b). This is in keeping with sustainable design methods, such as permaculture. The philosophy is that any waste is food for other parts of the system (Permaculture Institute, 2011). Systems thinking yields sustainable solutions; it represents significant potential for innovation for sustainability. Fleming is a leader in innovation for sustainability as is evidenced by its involvement in the Centre for Alternative Wastewater Treatment and its sustainable building programs as well.

Case study: Fleming College's innovation for sustainability.

There are many approaches to sustainable building. The LEED certified structures that are becoming common on North America campuses represent a suitable option for urban institutions. Straw bale building, once a rural phenomenon, is now being brought to the mainstream by students and faculty at Fleming College, in Ontario (Fleming College, 2009). Before, the thick walls and labour intensive plastering made this building method cumbersome. The program coordinator believes the new prefabricated straw bale wall technology that Fleming has developed is "a significant development for the housing industry. There aren't very many 'green' technologies that outperform their conventional counterparts while also being no more

expensive and using materials, ingredients and labour that are entirely local” (Fleming College, 2009). A structure that Fleming students built on the Trent University campus used almost all local and some reclaimed resources. Ideally in a few years time Algonquin will be publicizing its innovation for sustainability.

Extra-Curricular Education for Sustainability

While curriculum is the focus of this thesis, other means of educating for sustainability will briefly be highlighted here. Extra-curricular education for sustainability is defined here as being the result when a college takes actions and/or initiates projects that directly or indirectly teach students about sustainability. At Algonquin such initiatives include an ongoing Champions of Sustainability Speaker Series (Algonquin College, 2010a) and See Earth, an annual international trip (Algonquin College, 2008a). Also, Algonquin’s commitment to all new college buildings being LEED (Leadership in Energy and Environmental Design) certified (Algonquin College, 2010d) provides an opportunity for students, staff, and faculty to experience new best practices for sustainability. For these initiatives to have the greatest impact there should be a plan to expose the maximum number of students to the information and to create opportunities for students to apply principles of sustainability in their curricular or extra-curricular activities.

There is a trend towards making North American campus operations more sustainable by changing the practices of food and beverage provision. This is accomplished through offering more local, fair-trade, and/or organic options while simultaneously reducing energy usage and garbage. An AASHE report (available only to members) states that 98 colleges and universities now have composting programs including Harvard, MIT and Yale (AASHE, 2011b).

Algonquin’s sustainability white paper mentions the possibility of involving students in creating a worm-composting program (Aubut et al., 2009). This project would be unique, fun, and

potentially a way to fulfill the Talloires commitment to involving primary and secondary schools with sustainability. Many colleges run their own farms or gardens (Colorado College, n.d.; Berea College, 2009a); another non-public AASHE webpage lists 13 examples of campus supported farms or gardens (AASHE, 2011c). North American college students are involved in these projects in both curricular and extra-curricular capacities.

It is also relevant that 192 North American campuses make use of solar power (AASHE, 2011e) and many others have wind power; modeling sustainability is itself a form of education for sustainability. In addition, 53 campuses have renewable energy research centers (AASHE, 2011d) that directly or indirectly engage students in learning about sustainability. As with the campus farms, some colleges use these facilities in delivering education for sustainability and others separate their research and program delivery. Algonquin should continually offer public tours of the sustainable features of its new buildings.

There are plenty of extra-curricular ways for students to learn to engage with the issue of sustainable waste management. At least 16 North American college campuses are working on bottled water elimination or reduction (AASHE, 2011a). At Ithaca College those walking around campus with reusable mugs have been randomly awarded coupons for free coffee in acknowledgement of their waste reduction efforts (Ithaca College Dining Services, n.d.). Another campus had great success with a yard sale when students were leaving residence and had items for repurposing (South Carolina Now, 2011). Another innovative waste reduction strategy was a contest wherein various departments on campus competed to see which could use the least paper in a week (Anson, 2011). As mentioned in the section on agriculture, composting is becoming more popular. This represents great opportunities for students to research and develop both small and large-scale composting operations. Innovation is necessary to produce

more economically, ecologically, and socially appropriate waste management strategies. Waste is an ideal issue around which colleges, governments, and industry can collaborate.

At Mercyhurst College, students recently:

- organized a “Pedal for the Planet Duathlon” that raised \$3,000 for the design and installation of bike racks in the city...
 - assisted community leaders in trying to establish a network of urban gardens;
 - helped conduct energy audits aimed at reducing energy use in the Erie School District;
 - conceived and researched the idea of a green roof on a wing of the college’s science hall;
 - and engaged in the development of organic farming projects at the Mercyhurst farm
- (Mercyhurst College, 2011).

These initiatives are exceptional because they represent action on most points laid out in the Talloires Declaration including working with primary and secondary schools. Also, the fact that the initiatives were student-led shows that the college has successfully fostered a commitment to civic engagement and social sustainability.