Taking Sustainability Personally: The Impact of Teaching Sustainability Agency on Learning

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Abstract: Students are transformed when they realize that their theory-based actions have real and meaningful impact. Student learning outcomes are enhanced when they realize this impact. This is important, because the topic of sustainability involves a huge amount of grim data about the state of the planet and our impending demise; and an urgent call for action to make positive impact. To enable my MBA students to take action, I designed an experiential, action research and transformational pedagogical approach; and a mixed-methods study to assess if/ how students engaged with, and learned or cared about sustainability when it was delivered at the level of personal impact and personal action. I found that making sustainability personal did not cause alienation, but did significantly contribute to learning and caring in all students in the course. However, students' comfort with uncertainty moderated their perceptions of learning, which provides insight for how to improve the course in the future.

Keywords: sustainability leadership; MBA; experiential learning; transformational learning; agency; personal action; action research

The Call to Action

For decades now, we have unfortunately allowed ourselves to live in a state of denial about the consequences of our actions on the planet that have caused, for example, an excessive accumulation of CO_2 in the atmosphere (Klein, 2014; Mackay, 2008; Rich, 2018). Our lifestyles have also led to so much plastic in the ocean that marine life and ocean ecosystems are being decimated (Stokstad, 2006). As scientists projected, an increasing number of communities are seeing their homes destroyed as a result of extreme weather conditions (Rich, 2018). However, despite our evolving awareness of the social, environmental and economic impacts of climate change, we – governments, organizations and individuals – are generally struggling to agree on what to do about it (Mackay, 2008).

Despite consensus in the scientific community that human existence is threatened as a result our changing climate (Cook, 2013), a proliferation of misleading information has led to 33% of Canadians believing that climate change is not real (Klein, 2014; Zimonjik, 2018). Much of this disbelief is as a result of actions by governments and corporations that fail to acknowledge or redress unsustainable practices. In many cases these organizations have worked to support and perpetuate actions that lead to climate change. Their actions have served to undermine efforts to address or stop the causes of climate change. In large part, due to the significant number of individuals and organizations that question the existence, severity and causes of climate change and a lack of agreement about how to approach sustainability, governments and major corporations have largely continued to take stands and enact policies that put our planet at increasing risk (Klein, 2014; Rich, 2018).

According to the maxim attributed to Margaret Mead – as with all change – reversing the status quo will come down to a small group of individuals taking collective action. Therefore, when invited, I accepted the challenge to teach sustainability to graduate business students. It seemed opportune to teach sustainability leadership to and work with this part-time MBA cohort to enact change in the face of uncertainty and, potentially, impending climate disaster (Rich, 2018).

Usually, I teach innovation and strategy at the undergraduate level but, as an action researcher and social entrepreneur who observes, seeks to understand, and then enacts change at a community level, I engage regularly with and talk about sustainability to groups and individuals from 10 to 80 years old. I have found that connecting with individuals in an emotional and personal way – that relates directly to their own experience and action – is the most powerful way of enabling sustainability change. As a result, I argued to teach the part-time MBA class experientially, approaching the course from an action research perspective.

Since experiential learning involves the student directly interacting with and applying theoretical and abstracted learning to and in the world (Dewey, 1916/2008; Heron & Reason, 1997; Hill & MacDonald, 2016; Kolb, 2014), I felt comfortable proposing this approach to the course. Also, the higher education context enabled students to apply their sustainability learning as leadership; which would give students an opportunity to not only learn about sustainability in a real-life context, but to personally and immediately begin to address complex and pressing sustainability challenges to instigate and realize different – better – real-life outcomes (Burns, 2016; Greenwood & Levin, 2007).

Sustainability relates to understanding the interconnectedness between global social and relational issues, local community networks, economic systems, environmental boundaries, and

political institutions (Burns 2016; Capra, 2002; Komives et al., 2005; Nolet, 2009). Sustainability requires the generation and implementation of collaborative solutions to real, dynamic and compounding problems (Steffen et al., 2015; Weissman, 2012). Leadership is a critical component of sustainability (Parkin, 2010), and teaching sustainability requires enabling students to become change makers and change leaders in their communities (Burns, 2016; Shriberg & MacDonald, 2013).

Emotion, Learning, and Empowerment

I argued that bringing sustainability down to personal action would encourage and enhance learning about the factors contributing to climate change, and a feeling of empowerment to affect positive outcomes (O'Regan, 2003; Weiss, 2000; Zembylas, 2007). "Emotion impels what we attend to, and attention drives learning. So, one of the most important things we have to do is to ensure that learners become emotionally involved in whatever we're teaching them" (Weiss, 2000: 47). My insistence on making sustainability personal was supported by educational psychology research on experiential education that emotion enhances attention, focus and memory (Goralnik, Millenbah, Nelson & Thorp, 2012). This research also states that education in general, and sustainability education in particular, has an obligation to engage students emotionally, and enable students to understand their personal role in decision-making (Burns, 2016; Furrer & Skinner, 2003; Goralnik et al., 2012; Skinner, Marchand, Furrer, & Kindermann, 2008; Wentzel, 1997).

Learning about sustainability is very much influenced by students' own subjectivity, which is made up by their own unconscious and conscious views of the world, how they relate to the world, their emotions about how the world works, and their emotions when their views are challenged (Robinson & Ferfolja, 2001; Weedon, 1997). Students' knowledge is comprised of "truths" they hold about the world, and the degree of power they feel they have in their life based on these "truths". Students (and people in general) are active participants/ agents in the construction of their own perception of the world and their influence over it (Robinson & Ferfolja, 2001; Sawicki, 1991). Experiential learning involves "complex interactions between experience, perception, cognition, and behavior" (Hill & MacDonald 2016: 55).

Examples beyond sustainability, in the areas of teaching other controversial topics like ethics, immigration and politics, illustrate that taking content to the level of personal feelings enables conversations about the broader applications and implications of students' learning (Bauer & Clancy, 2017; Goralnik, et al., 2012). Value conflicts sparked by discussions around controversial topics activate the brain emotionally in a persistent way (McCuen & Shah; 2007). People in general react emotionally in such instances, before engaging in logical thought. "Only as the emotional involvement wanes can actions be influenced by cognitive thinking" (McCuen & Shah; 2007: 45). If learning starts with focusing on intellectual cognitive development when teaching controversial topics, students are not taught the skills to deconstruct or process their initial emotional response, and therefore are not able to make logical decisions based on a comprehensive understanding of the issue at hand (Bauer & Clancy, 2017; Goralnik et al., 2012; Kort, Reilly, & Picard, 2001). "Instruction to improve emotional maturity must be accompanied by teaching of cognitive subject matter if long-term learning is to occur. Emotions influence the solution of ethical problems as they affect the accuracy of the problem assessment and the accuracy, intensity, and duration of an emotive response" (McCuen & Shah; 2007:44).

Higher education provides the space and opportunity to create engaged, active citizens who are motivated to care, instead of students simply armed with content knowledge (Goralnik, et al., 2012; Dewey, 1938). Scholars note the importance in sustainability leadership education of gaining awareness and consciousness of how we live as individuals and our impact on society and the environment (Burns 2016; Ferdig, 2007). By starting at a personal level, Bauer and Clancy (2017) show that students are able to expand the scope of their understanding beyond simply their own thoughts and actions, to include wider contexts and society. More importantly, experiential higher education in sustainability empowers students to make ethical decisions, and impels them to personal and societal action (Goralnik, et al., 2012; Johnson & Frederickson, 2000).

Pre-empting the Backfire Effect

However, *being* sustainable inherently relates to behaviours. Humans do not choose and enact behaviours based on their values. Instead, in line with the justification hypothesis, humans justify their behaviours using their values. Therefore, by getting students to question and rethink their behaviours, and asking them to assess the impact of their behaviours, I would be challenging or questioning their values. Zawadski, Danube and Shields (2012) note that teaching students controversial or contested subjects (in their case, gender inequity and sexism) is often met with *reactance*. The authors define reactance as "as a motivational state to refuse information and consider it untrue regardless of its content or actual veracity, typically because the information is perceived as constraining one's choices (based on Brehm and Brehm 1981)" (p.606). They go on to state that, when faced with the possibility that their choices were about to be constrained, individuals sometimes develop hostility towards certain ideas, even if they had never exhibited the behaviours or attitudes that were being challenged or questioned (Rosen and Mericle, 1979; Zawadski, et al, 2012).

Therefore, there was a very real risk that making sustainability personal would make students feel judged and get defensive, alienating them from learning about sustainability and from taking action in their personal and professional lives. Many experts with whom I discussed my plans for teaching this course suggested keeping the learning at arm's length; laying the responsibility for sustainability at "someone else's" feet. However, as an experiential educator, I remained committed to contextualizing learning and to teaching by doing.

Zawadski and his co-authors (2012), drawing on the work of researchers such as Burke, et al. (2011) and Eubank and colleagues (2011), suggest that experiential learning is especially effective in teaching students to grapple with complex, dynamic information, and when deeply ingrained behaviours and perspectives are challenged. The researchers recommend that controversial information should be taught in a way to increase feelings of *self-efficacy* (based on Bandura, 1977). What this means is that material should be taught in a way to enable students to feel personally capable of implementing the behaviours in order to achieve goals aligned with the new material they are learning, even (and especially) if these differ significantly from their pre-existing behaviours and perceptions. Drawing on Kolb's work (2014); and Kolb and Kolb's work (2005), Zawadski and his colleagues (2012) explain that feelings of self-efficacy are promoted when students are led through a four-stage process involving:

1) having concrete spontaneous or guided experiences on which they can reflect; which, aided by
2) peer learning and discussion; lead to
3) abstract ideas which connect past experiences to future actions they can take; culminating in
4) putting new knowledge into practice, even if in small and experimental ways that reflect or are actually embedded in their personal and work situations (Webster-Wright, 2009).

I did not start the course with the assumption that humans in general, or the students in particular, are bad and engage in terrible behaviours with regards to the planet. I started the course with the assumption that, generally, consumers are unaware of all the implications of their behaviours. My underlying theory is that knowledge affords us the power to do more of the things we consciously want to do, and fewer of the things we were participating in without our explicit and informed consent. Basically, I believe that knowledge and conscious thought enable purposeful and intentional action. In addition, managers are required to justify what they do and why they do it in their business. My intention was to encourage students to question what they do in their personal and professional lives and take sustainable actions where appropriate and necessary. As a result, the objective of this study was to document students' experience with personalizing sustainability and taking action in their personal and professional lives. I wanted to see whether bringing actions down to the individual level encouraged and enabled them to understand and apply sustainability thinking; or whether the value-laden aspects of this pedagogical approach are too alienating, forcing them to withdraw from learning completely.

Therefore, my null hypothesis (H_0) – that I was hoping to reject – was that making sustainability personal would alienate students such that they would take the personal stance of not caring about sustainability, and therefore not learning anything during the class.

My alternate hypothesis (H_A) – that I was hoping to be unable to reject – was that making sustainability personal would enable students to understand how sustainability related to them in their lives, and therefore care about sustainability enough to learn about what being sustainable involves, and to take action in their personal and professional lives.

Course Structure and Outcomes

Sustainability is a required course offered in the second semester of the part-time MBA program. It is a twelve-week course, meeting for three and half hours on one evening each week. The part-time MBA program is a 24-month cohort program tailored for working professionals with an average age of 35 years' old, twelve years' work experience, and four years' management experience (Simon Fraser University, 2018). There were 47 students in my class from a variety of non-profit and for-profit organizations. Nineteen students in the class were female; and 28 were male.

The course was structured to introduce the notion of personal responsibility for and engagement in sustainability, with the intention of building up "self-knowledge" (Burns, 2016: 2), critical thinking skills (Allio, 2005); and an understanding of how we can (continue to) make positive impact. The topics covered in the course related to:

- Why do we care about sustainability?
- Who is involved in sustainability?
- What does sustainability entail?
- How is sustainability achieved?
- What actions can you take personally and professionally?

To prepare students for the assignments and to set expectations in advance, detailed breakdowns were provided through the class's web portal more than a month before the start of class. The focus on personal responsibility – provided in the course outline and emphasized in the first class – was chosen to enable students to become sustainability leaders by carefully and deeply thinking about their actions and the implications of their actions (Burns, 2016; Hughes, Ginnett, & Curphy, 1993). To this end, I chose David Mackay's "Sustainable energy - Without the hot air" (2008), as the textbook for the course because it provided students with a relatively easy set of everyday items that contributed to climate change, and a relatively simple way for them to calculate the ecological impact of their actions. Students were also provided with a number of core (primarily news) articles to read and videos to watch, to assist with understanding their personal and professional impact, and how to quantify this impact. A more extensive list of optional readings was provided for those with particular interest in delving more deeply into the content.

The course centred around 3 key assignments:

1) A personal Impact Assessment, for which students had to track their consumption and usage of everything – food, transportation, energy, etc. for 2 weeks and calculate the social and environmental impact of this on the planet; and then create
2) An Action Plan, for which students had to say what they would DO based on their assessment; and
3) A group assignment, which required that students design and present strategic recommendations to the senior leadership of the University about how to pursue and advance sustainability in the University's operations and across its programs.

Classes were structured around exercises that required discussion, research, presentations and debates. Both individual and group assignments, and in-class exercises were created to empower students to bring together all their learning and make decisions about how to act more sustainably. The intention behind all course content was to reveal the impact of the decisions that we as humans make; and to show that the ways of fixing the problems are not defined or clear; but they ARE actionable. The intention was to show that there are a multitude of ways to behave sustainability immediately, but each way starts with understanding the ramifications of our current behaviour, determining what different outcome we want to achieve, and how we want to personally be involved in achieving that outcome. Sustainability is a journey; not a destination. Paraphrasing Peter Drucker's words, the course was structured to show that leaders break new ground and do the right things to be more sustainable; while managers prefer to follow peers and do established things right, even if these things are not sustainable (Drucker, 2008).

Individual assignments required that the students begin to gather data in the first or second week, and analyze this data throughout the semester, with the insight of why and how to enact more sustainable behaviours. At the same time, the students were working in groups in class to

discuss the different aspects of sustainability, and working on their group assignment to propose an organizational sustainability strategy for the University that would affect them as stakeholders (both during and after their MBA program).

The individual assignments were due only after the end of the semester, but the work involved in completing the assignments required ongoing learning, assessment and engagement throughout the semester. The rationale for making the due date for the assignments at the end of the course (rather than mid-way through the semester) was that students' measurements (assessed by them throughout the semester), class discussions and reflections and strategic decision-making (based on what to do about these assessments of their own personal and professional lives) were designed to enable students to understand and decide what they wanted to and felt they could/ should do about sustainability immediately and in the future.

Furthermore, I called upon the help of a senior lecturer in the University's design school (the School of Interactive Arts and Technology) to teach the students skills to visually display their personal impact analysis and action plan for the purposes of making and articulating their decisions and actions. As a design instructor, he focused on teaching students how quality data visualizations must display information to enable and explain decision-making, instead of teaching student to measure specific things or follow prescribed formatting templates. He had, in the past, asked his students to develop graphical representations of their environmental footprint analyses which I had had the opportunity to observe. Based on this, I believed strongly that inviting him to help my students would help achieve two goals:

1) It would demonstrate that the exercise of calculating one's environmental footprint was a recognized activity conducted by other instructors across the University. Visualizing students' environmental footprint was a not a shaming exercise, but a legitimate way of bringing sustainability to a personal and personally-actionable level. In addition, collating useful data was critical to communicating this information in a clear and impactful way to facilitate decision-making; and

2) This would show the students that there was no prescribed format nor was there a template for the content of their consumption/ impact assessment – that this was for them to determine. For example, there was no defined expectation that they assess their CO_2 emissions, or disclose what they bought or discarded. What students tracked and reported, and how they reported this was up to them. The class was not set out to prescribe actions that individuals *should* or *must* take to become more sustainable. The course was designed to enable the students to explore their own actions in an effort to become more aware of many of the things we take for granted every day. The course laid out the responsibility we place in the hands of government, corporations, and individuals with the intention of exposing many of the assumptions that humans make, and things we take for granted, as consumers, citizens and business executives/ leaders. Then, students were expected to choose for themselves whether they wanted to change anything in their lives or jobs. But most importantly, they decide why they wanted to change anything, if they chose to make changes.

Methodology, Data Collection, and Analysis

In order to determine whether making sustainability personal resulted in *alienating* students from *caring* about sustainability and therefore preventing them from *learning* anything about

sustainability, my study involved: qualitative analysis of in-class observations and the two major individual assignments; qualitative and quantitative analysis of a post-pre survey; and quantitative analysis of students' ratings of how much they professed to care about sustainability (please see Appendix A for the survey instrument).

The qualitative component of this research has its foundations in grounded theory (Charmaz, 2005; Corbin & Strauss, 2008; Glass & Strauss, 1967; Strauss & Corbin, 1990; 1998). This means that I did not start the study with any pre-determined/ defined idea of what I would see from students. I did not know exactly what *alienation, caring or learning* would look like, if and when these things happened. "The abductive nature of grounded theory has been critical in allowing us to determine patterns as they emerge from the data to form a working hypothesis with criteria for analyzing the data that is solely based on the student experience rather than constructed a priori. In this way we have allowed the data to speak to us" (Hill & MacDonald 2016: 58).

This required that my research assistant and I observed all class discussions, making notes of interactions between and with students, making memos and transcribing interactions, and ascribing codes to our perceptions on a constant and continuous basis. We debriefed immediately after each class, and discussed what we were seeing each week and how this differed from expectations, and from previous weeks. We noted our overall perceptions of how students were/ were not engaging as the course progressed. We used a "constant comparative method of analysis in order to continually review existing data and compare and categorize new data based on the coding of that data" (Burns, 2016:4). We used students' words and phrases to reflect the students' voices (Saldaña, 2009) and ensure that what emerged was based on the students' perceptions and experience of the course.

In-Class Observations

For about half of each 3 ½ hour session each week, students were asked to discuss in small groups, and share with the rest of the class, their in-class thoughts and (where appropriate) prior research on specific sustainability-related topics. My research assistant and I observed the discussions being conducted in each group; noting specifically:

- Levels of engagement of each group member; paying particular attention to:
- Statements that indicated their perceived role in sustainability;
- Indications that students had distanced themselves from the topics under discussion specifically, or the idea of sustainability in general.

Individual Assignments

For coding the two individual assignments (n=94), I worked with *two* research assistants. The additional research assistance provided another voice and set of opinions to the coding process and augmented the study with an extra measure of inter-rater reliability. All three of us went through each assignment, noting:

- The definition of sustainability that could be determined from the student's assessments of their own impact on the planet and how they felt they could or should impact the planet in the future;
- The level of detail in each assignment that indicated the aspects of sustainability that the student perceived (i.e. demonstrated *learning*), and that s/he perceived being able to affect personally and professionally (i.e. demonstrated *caring*);
- The level of personal engagement with topic of sustainability, which was the interaction between understanding/*learning* about different aspects of sustainability and whether the student demonstrated *caring* by taking action in specific areas to make a (stronger) positive impact.

Group Assignment

Students presented their group projects twice in the second half of the semester. During both presentations, my research assistant and I made memos about: how each group was articulating sustainability; how superficially/ integrally students perceived sustainability to pertain to an organization's strategy and expectations of continued success; strategic, environmental, social financial and reputational reasons for engaging in sustainability; and practical actions that related to and were required for achieving sustainability. We also noted down which group members participated in the group presentations, and the answers that each group member provided during the Q&A sessions. Senior administrators from the graduate and undergraduate business and design programs were invited to observe the final presentations. My research assistant and I also made memos about how each group and each individual defended their proposals to these senior decision-makers.

Post-Pre Survey

At the end of the course, an online survey, consisting of 8 quantitative (Likert scale) questions and 3 open-ended long-form questions, was administered to the class. The survey asked students to rank how they felt their awareness of sustainability (which I took to indicate *learning*) and willingness to take action (which I took to indicate *caring*) (on a Likert scale from Strongly Disagree (1) to Strongly Agree (5)) changed as a result of the course (see Figure 4) on 8 quantitative questions and 3 qualitative questions (see Table 5). Students (n=16) reported on how their knowledge, understanding and plans regarding sustainability had changed over the semester and, if these had changed, whether this was (in full or in part) due to the course. The survey was voluntary and anonymous (and, therefore, not for marks), and was due after the final assignments were submitted to ensure that students had the opportunity to consider and assess the impact of their behaviours on the planet and their intentions to make (more) positive impact in the future.

"Care-o-meters"

At three different points in time – in the first class, in the middle of the semester, and in the last class – students were asked to note their attitudes towards sustainability on a *care-o-meter*. This simple, anonymous device visually captured how much they felt they cared about sustainability at a point in time. The device did not specify what *caring* involved, nor did it define *sustainability*. It simply registered the students' sentiments towards the topic at that time.

Quantitatively, our hope was (ultimately) to assess whether *caring* (the ratio of students who cared and felt able to take action, however this was assessed over time) correlated with *learning* (the ratio who were able to identify a number of factors that contributed to sustainability, which we hoped to be able to identify in the individual assignments).

We triangulated our findings with the results from the qualitative (grounded) and quantitative analyses of the post-pre survey (n=16) to generate an understanding of how the process of making sustainability personal enabled (prevented) students to lead (from leading) by taking sustainable action in their home or work contexts.

Here I present the result of themes that emerged from my analysis. I use quotes to highlight and illustrate the themes that resulted from a general process of open and axial coding (Burns, 2016). Names of participants have been removed to protect students' identities.

Results

A Lack of Disengagement

I introduced personal responsibility and engagement in sustainability immediately in lecture 1. If H_0 was supported, I expected to see students disengage immediately from the course and from the classes over time. However, over the semester, our repeated observations did not find evidence of students disengaging from the course.

One of the ways we measured disengagement was with the *care-o-meter* (see Table 1 and Figure 1, below) which showed 4 students of the class reportedly caring little, 21 students caring somewhat, and 17 caring a lot about sustainability in lecture 1. If H_0 had been supported and making sustainability personal caused students to become alienated, we expected that students would 'shift left' on subsequent *care-o-meters*.

Table 1. Frequency counts of self-reported caring about sustainability, Lecture 1.

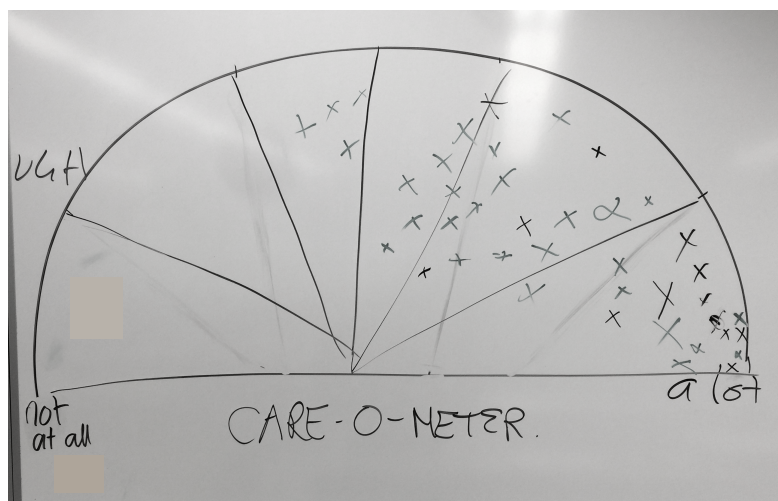|	Cares little (left side of *care-o-meter*	Cares somewhat (1st and 2nd wedges on right)	Cares a lot (furthest wedge on right)
Frequency count	4	21	17

Figure 1. "Care-o-meter," Lecture 1.

Instead, by mid-way through the semester, ongoing observations by both me and my research assistant, as well as a follow-up *care-o-meter* assessment, repeatedly found extensive engagement in class and 100% participation in group discussions. We observed <u>no</u> eye-rolls, crossed arms, aloof attitudes, or even sideline belittling conversations during group in-class working sessions. In addition, more than 30% of the class had contacted me in person or by email to discuss the awareness they were gaining about sustainability and how this had and was affecting their behaviours and their lives.

Despite the fact that we did not observe any disengagement in class (either evidenced through repeated absences or lack of in-class participation), the mid-way *care-o-meter* (see Table 2 and Figure 2) showed a more marked split in students' sentiments towards sustainability. However, contrary to H_0, the majority of students had 'shifted right' to care more about sustainability.

Table 2. Frequency counts of self-reported caring about sustainability, Lecture 6.

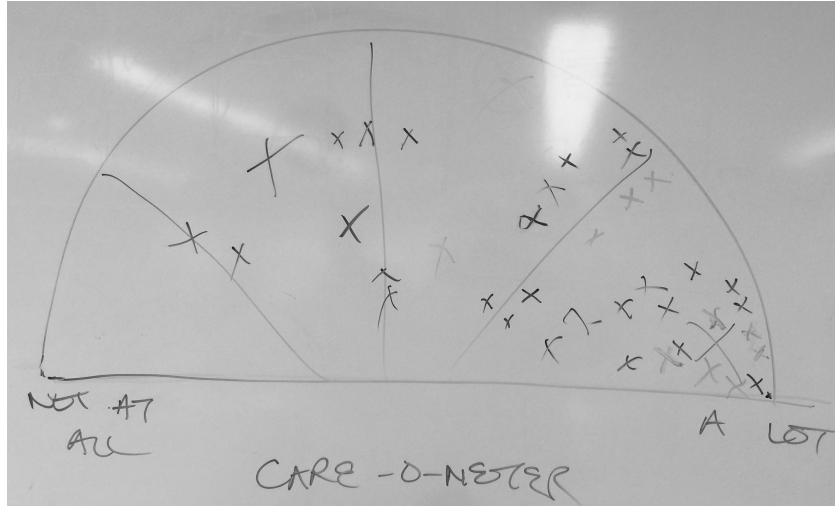|	Cares little (left side of *care-o-meter*	Cares somewhat (1st and 2nd wedges on right)	Cares a lot (furthest wedge on right)
Frequency count	8	8	23

Figure 2. "Care-o-meter," Lecture 6.

Four (100%) more students reported not caring about sustainability than they did initially, and 6 (35%) more students reported caring about sustainability a lot. The number of students who cared somewhat about sustainability had decreased by 72%.

During the second half of the semester, as the topics veered more towards being more sustainable both personally and professionally, students remained engaged in in-class discussions.

The final *care-o-meter* (Figure 3) in the last class asked students to report on any changes in their sentiments towards sustainability over the semester. Only 12 students recorded their change in sentiments. The trend was interesting, as 100% of these students reported caring more about sustainability than they did at the beginning. All but one of the students who recorded their sentiments reported ending the semester "caring a lot" about sustainability.
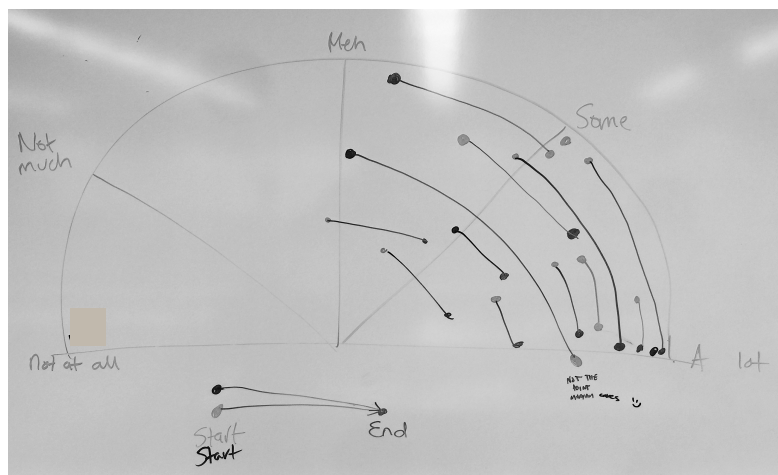

Figure 3. "Care-o-meter," Lecture 12.

Our qualitative assessments suggested overwhelmingly that students did not seem to be alienated by the pedagogical approach of focusing on personal responsibility and engagement in sustainability. We found <u>no</u> support for, and therefore rejected, our null hypothesis.

Categories of Engagement

Having said this, our qualitative analysis of all our memos, transcripts, the individual assignments and final survey revealed that levels and types of engagement varied across students depending on how they defined sustainability. In our grounded analysis of individual assignments, the three coders similarly found three categories of engagement exhibited by students' definitions of sustainability: Operational Engagement, Theoretical Engagement, and Transformational Engagement (please refer to Table 3 for a summary of quotes illustrating the three categories).

Table 3. Students' definitions of sustainability and quotes illustrating the differences between types and levels of engagement.

	Operational Engagement	Theoretical Engagement	Transformational Engagement
Students' definition of sustainability (codes from individual assignments)	Sustainability can be measured and managed through tracking and reducing carbon emissions, energy use and resource use.	Sustainability begins within a recognition and a reckoning from within, about being a conscious consumer, and taking steps to reduce consumption.	Sustainability is about living one's values and acting with integrity, responsibility and generosity, such that individuals become agents of systemic change.
Illustrative quotes (drawn from post-pre survey responses)	*"I do wish we had spent more time assessing organizations and maybe working on cases to present sustainability solutions throughout the semester."* *"The courses could have benefited from having actual industry guest lectures who have applied sustainable practices in their organizations and seen value."*	*"I care about the health and development of third world countries and I also care about future generations; if I don't make changes then no one else will."* *"I see the importance of changing the way we think."*	*"Before taking this class I thought sustainability was about recycling and caring for the environment but that is merely the tip of the iceberg. Today I see it as an ever-changing and evolving journey where we must engage the world differently for today, tomorrow and the future."* *"Sustainability is not an intangible pursuit that some people choose to care about, it is an absolute necessity. Even for situations where someone has something in excess, there is a moral duty to use it efficiently and carefully."* *"Sustainability is not only making ecologically intelligent choices, but also passing on information and influencing those around you, especially your children, to grow up behaving as sustainably as possible."*

Operational Engagement (n=7). This category of student acknowledged both personal and professional roles in sustainability. Students in this category demonstrated *learning* about sustainability by listing major contributors to climate change (carbon emissions, resource use, energy use, etc.); but demonstrated low intentionality with respect to taking personal or professional action; e.g. one submission stated:

> *"Unfortunately, the sustainable decision is not supportive of my business model and I cannot change my personal/business process."*

This category was termed "operational engagement" because students in this category repeatedly referenced industry best practices and instructions about how to apply others'/ existing solutions to their home and work contexts. Students in this category found it dissatisfying to come up with their own articulations of problems and solutions, and to determine for themselves the outcomes from these solutions that they hoped to achieve.

This category of student seemed the least comfortable with the messy complexity of social and ecological problems involving multiple systems (Daloz Parks, 2005; Heifetz & Laurie, 2001) that required "collaborative and relational models of leadership" (Burns, 2016:1) instead of prescriptive action.

Theoretical Engagement (n=16). This category of student engaged ideologically with the notion of sustainability. Students in this category demonstrated *learning* about a broad spectrum personally-relevant factors involved in sustainability, e.g. the impact of mixed fibres in clothing and socially destructive manufacturing processes employed in the fast-fashion industry; the carbon impact of meat production and the mistreatment of animals in factory farming. Theoretically engaged students demonstrated caring by connecting personally to the notion of improving sustainability in their personal and professional lives.

However, this category of engagement was labeled "theoretical" because it was not clear how students planned to implement their sustainability ideas. The details for what new behaviours these students planned to engage in, how they would implement these behaviours, the reasons for engaging in these new behaviours, or the sustainable impacts of these new behaviours were limited.

Transformational Engagement (n=24). This category of student engaged on a deeply personal level (privately and professionally) with the notion of sustainability. Students in this category demonstrated *learning* about sustainability by engaging in extensive research about the qualitative and quantitative social, environmental and economic consequences of activities they engaged in personally and professionally. They demonstrated *caring* by articulating sustainability as a moral imperative, and identifying the corrections that they had already taken and planned to take.

This category demonstrated what Burns (2016) described as "a shift in both perspectives and practice" (p.2) as they critically questioned and unpacked the underlying causes and multiple aspects of sustainability problems, reframed their understanding of the world, and transformed their attitudes and ways of being. Students in this category seemed excited to re-evaluate their beliefs and perspectives and develop new habits and behaviours now and in the future (Cranton & Roy, 2003; O'Sullivan & Taylor, 2004). Students in this category showed evidence of being transformed by their new knowledge of sustainability, and of developing (and in many cases had

already put into practice – at home and at work) articulate, implementable and impactful strategies for being more sustainable at home and at work.

These same categories were also identifiable in the qualitative coding of the post-pre survey data. Exemplary quotes from the survey help illustrate the differences in engagement in sustainability between these three categories.

Discussion

Observer Effect

A question immediately arises as to whether the fact that the class was part of a research study around *learning* and *caring* about sustainability influenced students' observed and recorded behaviour. It is important to note that students' behaviour was observed in class, where there is an expectation by students that their participation would be observed and recorded as part of their participation grade evaluated by the instructor and their peers (www.ethics.gc.ca). MBA students are also regularly surveyed for their honest opinions about course content and instructor performance, and do seem to be concerned that unfavourable responses might yield negative personal repercussions.

I did not observe that, after sitting in or with a group, that the topic or focus of a group changed when my research assistant left a group, or that any eyes rolled after he left a group he was observing. Also, it bears noting that we observed all students in the class. Therefore, if students' behaviour changed as a result of observation, it did not change uniformly across the class, demonstrating that differences still existed across students on the criteria being assessed.

Also, the students were likely most conscious of us using the course data for research in the first class where I introduced the study and my research assistant. It was after this introduction that the students noted (anonymously) their positions on the *care-o-meter* after both I and my research assistant had stepped out of the class. This first recording showed the widest range of positions on the *care-o-meter*. Thereafter, our presence simply became expected and normal. While both I and my assistant attended (though were outside) the class during subsequent *care-o-meter* recordings, simply the fact that we were observing the course does not explain, by itself, how or why the positions recorded on the second or third *care-o-meters* changed.

Comfort with Uncertainty

I am an innovation and entrepreneurship scholar, teacher and practitioner who focuses on sustainability as a source of innovation opportunities. As such, I found remarkable similarities between the categories that emerged from our coding, and the categories of innovators dealing with dynamic technological changes (Papania, 2012). In her study of individuals developing ideas in contexts of great uncertainty, two distinct categories of innovators emerged:

1) "Should-be"s: individuals who look to best-practices, legitimate, widely-understood and accepted practices with known and defined outcomes. These individuals displayed many of the same characteristics as students who demonstrated Operationally Engagement.

2) "Could-be"s: individuals who focus on identifying and participating in/ creating new-to-the-world solutions to real, personally-relevant problems in ways that are often not immediately recognized as useful or valuable because they do not reflect what is already known and being done by others. These individuals displayed similarities with students who demonstrated both Theoretical and Transformational Engagement.

In her study, Papania (2012) found that the proportion of "should-be"s in innovative organizations generally outnumbered "could-be"s 2:1. It was very interesting, then, to observe that in this class of MBA students, those who sought best practices were outnumbered by those who embraced solving problems in unconventional ways (which included both students in the Theoretical Engagement and Transformational Engagement categories) 5.7:1 (see Table 4). This suggests that the majority of students in this MBA program entered this course with an appetite for learning and embracing skills that would enable them to deal with an increasingly uncertain business environment.

Table 4. Frequency counts of students who define sustainability in terms of taking personal action (determined from individual assignments).

	Operational Engagement	Theoretical Engagement	Transformational Engagement
Frequency count	7	16	24

This finding, then, suggests that students' comfort with an experiential, action-research, transformational pedagogical approach to sustainability leadership might be moderated by the students' personal comfort with dealing with uncertainty and taking bold steps that make change that cannot immediately be assessed to "correct", "appropriate" or "enough".

Engagement Journeys

While the results showed <u>that</u> students' *caring* changed as a result of their *learning* about how sustainability relates to them personally and professionally, our results do not explain <u>why</u> this might have happened. Based on recurring themes (generated from statements) from students' assignments, I infer two main reasons for this change in *caring*:

1) **The quantitative impact of personal actions**. Students specifically stated that being able to identify the actions that impacted the planet, to quantify the damage done by these current actions and to measure the impact that changes in behaviour would make, significantly affected how they engaged personally with sustainability:

> *"I knew that regularly purchasing coffee in a disposable cup was "bad" for the environment. However, I was unable to quantify this… As I continued through the course, I learned more about fast-fashion and its impact on all areas of sustainability. This sparked an interest to explore further… [and compare the] impacts caused from purchasing a cup of coffee versus buying a new pair of jeans each year… Reducing purchases of fashion goods by*

83% ... lowers my waste to landfill, CO_2 emissions. An example, by reusing my jeans for at least the next ten years (without buying new ones) I will save 70lbs per year, 4,200lbs in my lifetime. By making coffee at home will reduce my landfill waste by 20lbs per year, close to 1,200lbs in my lifetime!"

"A record and assessment of my consumption over 14 days allowed the calculation of energy consumption (kWh), carbon footprint (CO_2e), and water footprint (l/day). All measures of consumption and impact indicate that I exceed my fair share of resources with the exception of the water footprint. I am skeptical that my water footprint is below the Canadian average. The environmental impact of toxic cleaning products on fresh water should be considered in order to have a better assessment of water footprint. The unsustainable use of resources is not limited to my personal life; a log of work consumption revealed that our use of healthcare resources and the environmental consequences of doing nothing was negligent."

2) **The ability and power to change.** Students' *caring* seemed to relate directly to their perceived ability to make changes in their behaviour and, thus, their impact:

"The idea of sustainability is simple: reducing waste, lower carbon footprint, consuming sustainable food, and much more. Sustainability is also EXTREMLY complex: human right issues around the world, global warming, etc. For me this course/assignment is not about solving the sustainability issues in the world. It is about starting small and being a voice and influence to the people and community around me. I became a mother ~10 months ago. The decisions I make today will have an impact on the future (big or small). I need to start somewhere. This Action Plan is my commitment in building a better future for my daughter."

"Before starting my Individual Action, I reviewed my Individual Assessment to reflect on the areas where I could take actions to reduce my overall energy consumption. I considered at length what I could do that would have an impact yet also what would be reasonable for me to sustain. Fuel use, water consumption and food wastage (and having children) were the clear areas in my assessment that revealed significant consumption. In most of these areas, it is possible for me to reduce my overall footprint, however, I have chosen to focus my Individual Action on my workplace instead. In part this is because I feel any reduction as an individual, while worthy, was smaller, and I believe I can have a greater a net impact at work than as an individual. My action will be targeted to three changes that I will implement in my workplace."

"At the time of logging my activities, I determined that the consumption required to do my job was not relevant to my personal footprint, however I now look at this differently. All of my decisions, both at work and at home, have ecological and social consequences that I am responsible for.

> *Therefore, I have chosen a specific area of my job to track where I see the potential to improve sustainability."*
>
> *"Throughout this exercise, many instances stood out where I thought I was practicing good environmental habits, but soon realized that in many areas I am making lazy decisions –i.e. why I always pay for the plastic shopping bags. On the other hand, I know that driving is a significant contributor to my carbon footprint, yet geographic realities for the most part prevent me from using alternative options. There were also a number of things I felt were totally out of my control. For example, the amount of plastic that is used for the food items I buy stood out, specifically, how many items are packaged in paper and plastic. In these cases, some steps I can take include changing brands of items I buy that may use less packaging, purchasing more bulk items and finding alternative uses for packaging, including kids crafts or pet toys instead of putting them out for recycling each week. Nonetheless, after completing this exercise, I have found some opportunities to reduce my impact and become a more informed decision maker in how my activities contribute to the planetary boundaries."*

Where *learning* was demonstrated (i.e. an understanding of the factors that relate to sustainability), but little or no change in *caring* was noted, it seemed to directly relate to #2, where students felt they lacked power to change:

> *"There are things we can and can\'t affect. Personally and professionally we have limits. I am happy to pursue things on a personal level but have only so much say on a professional level at this time."*
>
> *"I do not think I have learned sufficient tools on how to engage and persuade employers."*

Additional Insights into Students' Journeys

From the above qualitative analysis, I began to see that students in the Theoretical and Transformational Engagement categories felt similarly about their engagement journeys. I noticed that students in the Operational Engagement category felt distinctly different about their engagement journey. To gain more insight into this, I looked at the data from the post-pre survey.

As a reminder, the survey asked students to rank on 8 quantitative questions (see Table 5) how they felt their awareness of sustainability and willingness to take action (on a Likert scale from Strongly Disagree (1) to Strongly Agree (5)). The survey also asked students 3 open-ended questions requiring long-form answers.

Table 5. Post-pre survey questions (responses ranked from Strongly Disagree to Strongly Agree "Before" and "After" course).

Quantitative questions	
Q1	I was/am aware of the factors that impact sustainability.
Q2	I was/am prepared to think about the impact of my organization's strategies and actions.
Q3	I felt/feel empowered to ask questions about the impact of my organization's strategy and
Q4	I did/do know how to present a case for pursuing sustainable practices in my organization.
Q5	I did/will actively encourage my organization to pursue sustainable strategies and practices.
Q6	I did/will pursue and implement sustainable strategies and practices within my organization.
Q7	I felt/feel empowered to make sustainable decisions in my own life.
Q8	I did/will make sustainable decisions in my own life.
Open-ended questions	
•	If the course was partly or mostly responsible for changes in your ratings BEFORE and AFTER the course, what aspects of the course do you believe were most important for that change?
•	Please explain why your perception of the importance of sustainability has or has not changed.
•	Please explain why your plans to pursue sustainable practices have or have not changed.

The survey asked students to discuss changes in *learning* (Q1 & Q2) and in *caring* (Q3 – Q8) as a result of the course. Because the post-pre survey was not a required component of the course and was not for grades, only 30% of the class (n=16) students completed the post-pre survey. Therefore, the sample was too small to draw conclusions about students' *learning* and *caring* simply by looking at the quantitative results. Instead, my research assistants and I used the survey data to provide more insight into the categorization of students based on our previous qualitative analysis of students' assignments. We coded the long-form answers to the open-ended questions of the post-pre survey using the themes and codes that had emerged previously, and found evidence that students fell into the same three categories as before. When we analyzed the quantitative results of students in the 3 categories (descriptive statistics of this data are presented in Table 6) we found that the "after" positions of students in the Theoretical and Transformational Engagement categories were quite similar for many questions (see Figure 4).

Table 6. Descriptive statistics for "Before"/ "After" Post-pre survey responses for different categories of engagement.

| Category	Descriptive Statistic	Survey Question															
		QA1 BEF	QA1 AFT	QA2 BEF	QA2 AFT	QA3 BEF	QA3 AFT	QA4 BEF	QA4 AFT	QA5 BEF	QA5 AFT	QA6 BEF	QA6 AFT	QA7 BEF	QA7 AFT	QA8 BEF	QA8 AFT
Operational Engagement (n=3)	mean	3.33	4	2.33	3	1.67	2.67	2	3	1.33	2.33	1.67	2	2.67	3.67	3	4
	sd	0.58	1	0.58	1	0.58	0.58	0	1	0.58	0.58	0.58	0	0.58	1.15	0	1
Theoretical Engagement (n=3)	mean	2.33	4.67	2	4.67	2.33	4.67	2	4.33	2.33	4.67	2	4	2.33	4.67	2.33	4.67
	sd	0.58	0.58	0	0.58	0.58	0.58	0	1.15	0.58	0.58	0	1	0.58	0.58	0.58	0.58
Transformational Engagement (n=10)	mean	3.3	4.8	2.9	4.6	3	4.4	2.3	3.9	2.8	4.5	2.7	4.2	3.2	4.5	3.4	4.6
	sd	0.71	0.71	0.71	0	0.71	0	0	0.71	0	0	0.71	0.71	0	0.71	0	0.71
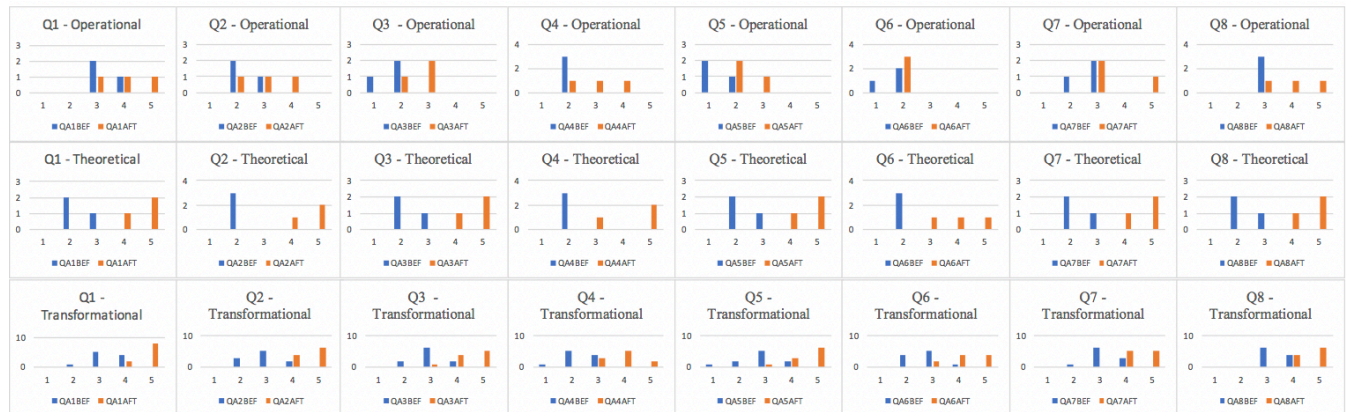
Figure 4. Post-pre survey responses for each engagement category – "Before" and "After."

Although there was no way to tie the post-pre survey data to the *care-o-meter* data, I felt able to hypothesize what led students transitions from caring "somewhat" to caring "a lot" over the course of the semester. By considering the post-pre survey data with the care-o-meter data, and aided by our qualitative analysis, I inferred that changes in *caring* involved either a significant change in awareness (for those in the Theoretical Engagement category whose journeys showed significant change from "before" to "after" the course), or a significant change in students' feelings of agency to make personal and professional change, and an understanding of where to start to make change (for those in the Transformational Engagement category whose qualitative answers showed students already making changes or planning to make changes in their personal or professional lives).

The learning journeys of students in the Operational Engagement category were different to those of students in the other two categories. Changes in *learning* (Q1 and Q2) and changes in *caring* (Q3-Q8) were quite evident in the Operational Engagement category (as they are in the Theoretical and Transformational Engagement categories). However, the students in the Operational Engagement category *reported* in the open-ended questions of the survey that the changes in their knowledge and behaviour were not significant. By contrast, students in the Theoretical and Transformational Engagement categories reported significant changes in mind-set and behaviours.

This was an extremely important finding for me. Students in the Operational Engagement category demonstrated changes in *learning* and *caring* in all aspects of the study (*care-o-meters*, individual assignments, observations, and quantitative portion of the post-pre survey) yet reported in the open-ended question sections of the post-pre survey that their learning had not changed much. This suggests that although an experiential, action-research and personal engagement approach seemed to enable transformational learning in all students in the class, their discomfort with the course made the learnings harder to articulate for those who were less comfortable with uncertainty.

Conclusion

This action research study had two interrelated goals: 1) to understand where sustainability improvements could be made in individuals' personal and professional lives, and then intervene in making these improvements; and 2) to understand how to create better transformational educational outcomes in the area of sustainability leadership (Burns, 2016).

Our qualitative and quantitative analysis provided reassuring evidence that making sustainability personal enabled students to assess and determine the behaviours and actions that they need to take to be (more) sustainable, and empowered them to make a positive impact on the planet. Also, it seemed that it did not alienate students from the subject matter, and did not impede learning about sustainability. Instead, it enabled the majority of students to make sense of the actions that are putting our future at risk, and identify personal and professional actions that they could take to affect change. However, the pedagogical strategies involved in enabling students to learn and care about sustainability, and to feel a sense of self-efficacy, require further discussion about the challenges and benefits of their implementation.

The literature supports that experiential education and sustainability leadership to a large extent require students to grapple with disequilibrium, chaos and uncertainty. To prepare students, then, to deal with such complexity, I framed the course in terms of innovation and dynamic decision-making under conditions of extreme uncertainty, and ethical leadership. And, although I anticipated a far greater backlash to the pedagogical approach than was received, it was important to stop and reflect just how uncomfortable the process was for a number of students, and how different it was to what they were expecting in an MBA program, or that they were willing to accept. This was captured in comments by one student:

> *"Compared to other MBA courses, I could not quantify what I actually learned from attending the lectures. I could [have] learned the same material myself by googling if I wanted. The courses could have benefited from having actual industry guest lectures who have applied sustainable practices in their organizations and seen value. Then [relating] how we can apply those practices in our work. This would have more been more suitable and valuable for MBA students. We are not arts students for which this course obviously [seemed] to cater to."*

Burns (2016) explained students' desire to "focus on content" as a "product of their traditional academic backgrounds" (p.8). Traditional teaching and traditional models of leadership look to provide students with expertise delivered by experts and senior managers who give directions and instructions for making decisions. "This traditional model assumes that there is a correct answer to a problem that can be arrived at with scientific objectivity" (Burns, 2016: 8).

Students are not accustomed to viewing content as dynamic, socially-constructed, and co-created, or to recognizing the perspective that the world is a living system (De Guerre & Taylor, 2004; Dirkx, 2001). This represents a "huge shift in students' epistemology", and learning content by building an understanding of self in the context of this living system is "actually difficult and rigorous as it requires learning from a wholeself perspective, rather than focusing solely on intellectual learning" (Burns, 2016: 8).

I provided detailed rubrics, responded to emails in great detail, held regular question-and-answer sessions about the assignments, and provided preliminary feedback to those who

requested that I look at early versions of their work. However, some students still felt that the guidelines and requirements were vague and insufficient. Burns (2016) says: that providing both structure and disequilibrium … creates a pedagogical space that is both bounded and open. Without question, in future iterations of this course, it would be essential to consider how to make sustainability accessible to students who need information packaged in a different, perhaps more prescriptive format incorporating recognized best practices and recognized metrics. One student suggested requiring that students put together a life-cycle analysis of a process that they are integrally involved in as an additional individual assignment, thereby splitting the personal engagement component into two sections; one focusing on students' private lives, the other focusing on their professional lives. This is something that I will incorporate into the course in future.

Having said this, the majority of the students seemed to recognize that leadership involves real world conditions of constant change, uncertainty, unpredictability, and interconnected webs of relationships (Burns, 2016; Capra, 2002; Ferdig, 2007; Wheatley, 2006;). Most students also seemed to embrace the notion that leadership education should prepare and empower students to "be responsive to the demands of specific contexts (Queenly, 2000), particularly ones that are constantly changing" (Hill & MacDonald, 2016:55). As mentioned previously, about 30% of the class reached out to me to discuss the impact that the pedagogical approach had made on their thinking and behaviour around sustainability. Some quotes from these communications include:

> *"It was certainly a challenging course, because the topic is so broad but at the same time I think one of, if not the course I have so far taken the most from that I can apply to in my own life outside of work as well."*

> *"I'd like to keep the website [that I created as my final submission]. Because it is not only the personal assignment but also what I learned from your class. I will use what I learned to the real world."*

> *"It was refreshing to hear that there are alternative strategies that we can take, and in particular that 'we', the students are in a position of power to make a difference. Although the individual assignment was challenging, I found some great value in analyzing some of my own habits and routines, and finding areas where I can improve."*

> *"I wanted to create a piece of informative art that I could hang in my house as a way of always inspiring me to remember this class but also something that is a conversation starter for guests that visit: a way of inspiring sustainability through engagement! Had it not been for me doing this project, I would not have learned what I know today and I would not have changed. Thank you from the bottom of my heart for changing me. Thank you from the bottom of my heart for redefining sustainability and what it means. Before taking this class I thought it was about recycling… Today I see it as an ever-changing and evolving journey where we must engage the world differently for today, tomorrow and the future. I have now done this at [my job] where sustainability is in full effect and now in my [new business]."*

> *"I am working on my impact assessment and working through the calculation and it is mind-blowing how each person uses a RIDICULOUS amount of water and energy per day. As painful as it is, thank you for opening our eyes and giving us the chance to do better while we can!"*

Making sustainability personal was able to move the majority of students even from positions of not knowing much about our effects on the planet, to radical modifications of their daily personal and professional practices. The experiential, action research approach helped most of the class to consider their unexamined assumptions about sustainability, and to understand and engage in sustainability leadership (Burns, 2016). The study enabled me to quantify and qualify the transformational effects of making sustainability personal on students' understanding and actions, and has also given me tools to improve the course in the future.

APPENDIX A: POST-PRE SURVEY INSTRUMENT

	BEFORE					AFTER				
	Strongly Disagree	**Disagree**	**Somewhat Agree**	**Agree**	**Strongly Agree**	**Strongly Disagree**	**Disagree**	**Somewhat Agree**	**Agree**	**Strongly Agree**
1. I was/am aware of the factors that impact sustainability.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2. I was/am prepared to think about the impact of my organization's strategies and actions.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3. I felt/feel empowered to ask questions about the impact of my organization's strategy and actions.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4. I did/do know how to present a case for pursuing sustainable practices in my organization.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5. I did/will actively encourage my organization to pursue sustainable strategies and practices.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
6. I did/will pursue and implement sustainable strategies and practices within my organization.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
7. I felt/feel empowered to make sustainable decisions in my own life.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
8. I did/will make sustainable decisions in my own life.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

B.   If the course was partly or mostly responsible for changes in your ratings BEFORE and AFTER the course, what aspects of the course do you believe were most important for that change?

C.   Please explain why your perception of the importance of sustainability has or has not changed.

D.   Please explain why your plans to pursue sustainable practices have or have not changed.

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