Leading Change: Student Engagement in Sustainability Leadership

by

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Abstract

Why do students engage in Sustainability Leadership (SL)? To answer this research question, an exploratory study using mixed methodology was conducted. For the purposes of this study, SL was defined as inspiring, supporting, and/or initiating collective actions towards a more sustainable society. The research was conducted on students enrolled in the Environment, Sustainability, & Society (ESS) undergraduate program at Dalhousie University. The purpose of this study is to contribute to an understanding of what leads to engagement in SL, with the hope of increasing engagement in SL, so that the negative impacts of sustainability issues (see IPCC, 2014), can be minimized and mitigated. To achieve this a survey was conducted (n=130), in addition to follow up interviews (n=4), with questions drawn from research on social movements (Beyerlein & Hipp, 2006 and Tindall, Davies, & Mauboules, 2003), environmentally significant behaviour (Dono, Webb, & Richardson, 2009, Fielding, McDonald & Louis, 2008), and sustainability leadership (Eike, 2014). The survey determined broad trends in reasons for engagement in SL to provide context to the interviews, and was also used as a selection process for the follow up interviews. The interviews characterized reasons for engaging in SL, and explored the relationship between students, the ESS program, and engagement in SL to gain a more detailed understanding. Results indicate that micromobilization theory has the most explanatory and predictive power for engagement in SL. A two-stage process is evident from the interview results whereby students must first have positive attitudes, beliefs, and values towards SL, and then be surrounded by a network of others engaged in SL that can help turn this passion into action. Survey results corroborate these findings, with having conversations about engaging in SL having the most predictive power, predicting 52% of variance in engagement in SL. The

researcher recommends that students, faculty and staff of sustainability education programs focus on creating networks of those engaged in SL, to increase engagement in SL.

List of Abbreviations Used

ESS: Environment, Sustainability & Society, an undergraduate program at Dalhousie University in Halifax, Nova Scotia.

SL: Sustainability Leadership, which for the purposes of this research is defined as inspiring, supporting, and/or initiating collective actions towards a more sustainable society.

TPB: Theory of Planned Behaviour, which predicts that individuals will engage in a behaviour if they intend to engage, and intentions are predicted based on an individual's attitudes, perceived behavioural control, and subjective norms.

Chapter 1: Research Question

1.1: Introduction

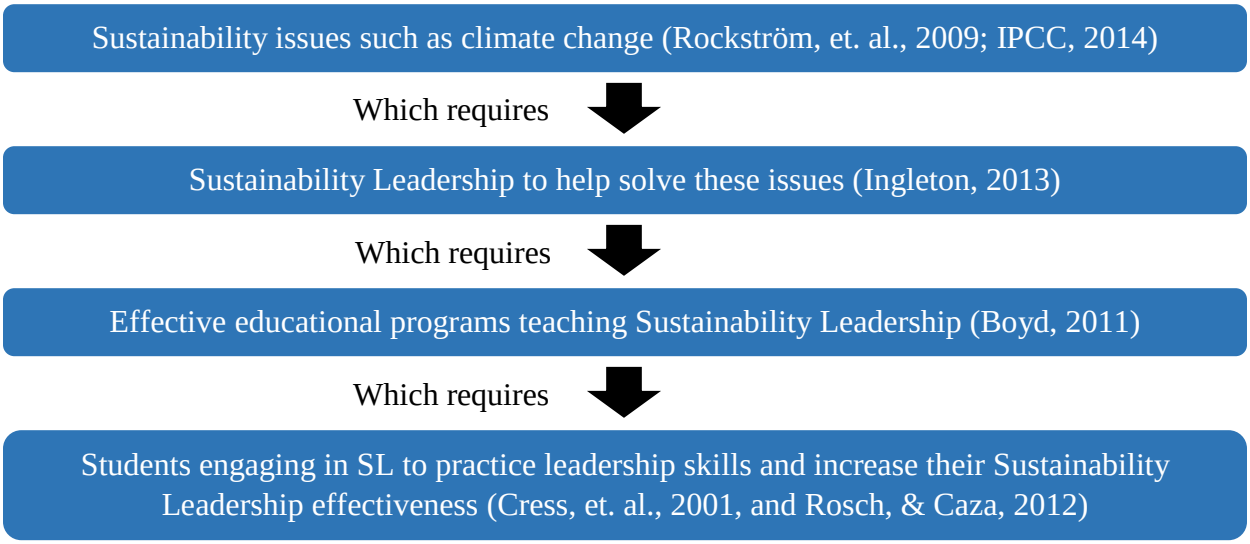
This study examines why individuals engage in sustainability leadership (SL). For the purposes of this study, SL is defined as inspiring, supporting, and/or initiating collective actions towards a more sustainable society. Specifically, this study looks at the engagement in SL of current students and graduates of the Environment, Sustainability, and Society undergraduate program at Dalhousie University, in Nova Scotia, Canada. The program has existed since 2008 and requires students to combine ESS with another major for a multidisciplinary degree (Dalhousie University, n.d.). The program was started to bring together a diverse multidisciplinary faculty to "examine and take action on today's most urgent global issues" (ibid.). According to their website, the number one reason students should study ESS, is to "help solve complex global challenges—like water and energy security, climate change, environmental degradation, and increasing urbanization" (ibid.). In the winter semester of 2017 the program has approximately 400 students enrolled in its core courses across 4 years of study. Roughly 30-40 students graduate from the program each year with ESS as their primary major, additional students take ESS as their secondary major.

This study is exploratory as research into reasons for engaging in SL has been limited thus far (see Eike, 2014, Visser & Courtice, 2011, and chapter 2 for more details). As such this study uses mixed methodology, which can provide a broader understanding of a topic (Creswell, 2008). A quantitative survey was conducted on current students and graduates of the ESS program while a smaller number of semi-structured interviews provided more detailed accounts of ESS students' views and experiences.

1.2: Problem

Complex, pertinent problems like climate change and other sustainability issues (Rockström, et. al., 2009) can negatively affect the environment, the economy, and society (IPCC, 2014), referred to as the three sectors of sustainability (Giddings, Hopwood, & O'brien, 2002). Strong leadership, from all levels of society, will be required to come up with solutions and deal with ramifications of sustainability issues. Luckily programs and classes such as the ESS program at Dalhousie that teach SL are increasing in higher education (Calder & Clugston, 2003, Cortese, 2003, and Lozano et. al., 2013), but are they effective? If programs such as the ESS program are to be effective in creating leaders that will help solve sustainability issues they must achieve at least two things: increase students' engagement in SL, and increase the effectiveness of students' SL. Research has shown that practicing leadership skills can increase the effectiveness of students' leadership when performed alongside formal leadership education programs (Cress, et. al., 2001; Rosch, & Caza, 2012). Students are also in a unique position to learn how to be leaders, as they are in transition and making decisions about their careers and life direction (Berg, 2003). Ultimately this makes the engagement in SL of students in sustainability programs vital for both increasing students' SL and increasing their effectiveness. This can provide the leaders required to bring about positive changes towards a more sustainable society, solving the sustainability issues raised earlier (Rockström, et. al., 2009; IPCC, 2014). In summary, therefor, the problem is that sustainability issues require leadership to be solved, which require programs teaching SL to be effective, which in part requires students to engage more in SL. A logic diagram can be seen below in *Diagram A* that summarizes the problem.

Diagram A: Problem Logic Diagram.



1.3: Research Questions

Since engagement in SL can both make sustainability leaders more effective and potentially solve or mitigate sustainability issues the main research question for this research is: **what are the reasons for engaging in sustainability leadership?** Additional research questions that will be examined are:

- Which theories/fields of study provide insight into sustainability leadership?
- What barriers exist to engaging in Sustainability Leadership?
- How does the ESS program effect students' engagement in Sustainability Leadership?
- What qualities or experiences correlate to Sustainability Leadership?
- Which theories can provide insight into Sustainability Leadership?

These additional research questions will be used to provide further insight into the main research question, and how engagement in SL can be encouraged and increased.

1.4: Purpose and Significance

The purpose of this research is to find out what the reasons are that students engage in sustainability leadership. This will allow programs such as the ESS program to be more effective by increasing the engagement of students in SL. Through practicing SL during their education in the ESS program, students will become more effective leaders (Cress, et. al., 2001; Rosch, & Caza, 2012). This will allow students to be more effective in working towards a more sustainable society, and mitigate and minimize the consequences of issues such as climate change.

This research provides an exploratory study on engagement in SL, a topic that has seen minimal research. Included in this is determining potential reasons for engaging in SL, what theories can provide insight into engagement in SL, and which qualities and experience potentially lead to engagement in SL. This allows for more educated questions, and provides a basis for future research. Additionally, this research contributes to the literature on the place of education in creating leaders for social change, especially leadership related to sustainability issues. This could be relevant and applied to other university programs such as international development, political science, economics, and business. All fields have social issues, understanding what makes individuals more likely to engage to try and solve those issues can be important information.

1.5: Limitations & Delimitations

Limitations to this study are mostly due to time constraints. Only current students were study subjects, which does not provide insight into the sustainability leadership of graduates. Findings could also be baised if this year's students are exceptional in some way. Additionally, since the ESS program is constantly changing, comparison between years is challenging since students do not receive the same material from the same professors, in the same circumstances year to year.

Conducting research on the most competent sustainability leaders in the ESS program proved challenging as they were busy, especially during the time the research was conducted (March-April). A final limitation that could have introduced potential bias is that the researcher is in the program, which could unduly skew the results towards personal opinions and experiences with the program.

Delimitations to limit the scope of the research are to have research conducted during only one semester (winter 2017), only on students of the ESS undergraduate program at Dalhousie University, and only study a small selection of students in depth. While this makes the study more specific to the ESS program at Dalhousie, it also introduces limitations in terms of the universality of any potential findings. Other university students in other programs living in other cultural contexts could potentially have vastly different experiences and interactions with sustainability leadership. Finally, this study only investigates what affects levels of engagement in SL and not the effectiveness of this SL.

Chapter 2: Literature Review

2.1: Introduction

Similar to other fields (Stirrat, 2008), and despite the importance of sustainability, little research has been conducted on the individuals who are attempting to make our society more sustainable. Specifically, on what makes individuals engage in sustainability leadership as previously defined. While limited research has been conducted on SL, more established research exists on similar fields of sustainability education, environmental activism, and pro environmental behaviours. These related topics can provide insight into the reasons why individuals engage in sustainability leadership. What follows is a review of the literature that exists on each of these topics and their relevance to engagement in sustainability leadership. The research highlighted was used to develop the questions for the survey and interview of this study.

2.2: Sustainability Leadership

A common definition of SL has not yet been clearly defined in the literature. Even the term for SL has not yet been clearly established, with some terming it Leadership towards Sustainability (Broman, et. al., 2014), and others Leadership towards Sustainable Development (Eike, 2014), or Sustainability Leadership (Visser & Courtice, 2011, Schwalb, 2011). Visser and Courtice (2011) defined a sustainability leader as "someone who inspires and supports action towards a better world" (p.3). Similarly, Eike (2014), drew upon Chemers' (2000) definition of leadership as "a process of social influence in which one person is able to enlist the aid and support of others in the accomplishment of a common task" (p.27), with the common task in this case being sustainability. Other definitions are more oriented towards business: "a sustainability leader is generally described as an individual who creates profit for his/her stakeholders, while protecting the environment and improving the lives of those for whom he/she impacts as a result

of his/her leadership" (Schwalb, 2011, p. ii). Drawn from this literature the definition of SL for this study is inspiring, supporting, and/or initiating collective actions towards a more sustainable society.

Research into sustainability leadership thus far has been limited primarily to competencies of sustainability leaders (Eike, 2014; Schwalb, 2011; and Wiek, Withycombe, & Redman, 2011), and sustainability leaders from a business perspective (Visser & Coutice, 2011, and Courtice, 2013). This is problematic for two reasons. First, as noted by Wiek, Withycombe, and Redman there is little empirical evidence that competency leads to action (2011). Second, sustainability leadership, and sustainability issues are not limited in scope to the business world. Despite no empirical studies testing the connection between competencies and action, it could be that certain competencies either make individuals more successful, leading to more action, or that certain competencies and approaches directly lead to individuals taking more action. Therefor, despite the limited scope of research on Sustainability Leadership thus far, specifically in its relevance to the research questions of this study, some insight can be gained.

In a study of 60 individuals engaged in sustainability, Schwalb (2011) identified three different roles that a sustainability leader can have: advocate, process-responsible, or outcome-driven. While Schwalb notes that there are common competencies for all of these roles, namely systems thinking and value based positive psychological constructs, Schwalb argues that the competencies required vary from what role a sustainability leader has (ibid.). Visser and Coutice (2011) and Courtice (2013), did not distinguish between different sustainability leader roles and only studied business leaders engaged in sustainability. While these results are limited in scope and highly biased towards a business context, the findings concurred with those of Schwalb (2011) and included systems thinking, and positive psychological constructs among others.

Visser and Courtice (2011) do mention that sustainability leaders are unlikely to encompass all traits, skills, styles, and knowledge that their model identifies, and that rather, sustainability leaders will "draw on what is appropriate or fitting to their own personality and circumstances, so as to be most effective in addressing sustainability challenges" (p.5).

Through conducting a literature review, Wiek, Withycombe, and Redman (2011), similarly found that systems thinking was an important competency for SL in addition to: anticipatory competence (being able to see and describe potential futures/consequences), normative competence (able to map out values, goals, principles and targets, and turn them into plans for the future or visions), strategic competence (design and implement interventions), interpersonal competence (being able to influence others). According to Wiek, Withycombe, and Redman however, combining these competencies effectively is just as necessary as having all the competencies to achieve sustainability (ibid.). Doing so could be a team effort, with each team member being stronger in one competencies than the other and collectively being able to effectively solve sustainability issues (ibid.).

Eike (2011), in a survey of 293 students involved in sustainability leadership, found that age, gender, and ethnicity influenced the personal practices, leadership capacity, and leadership style of student leaders. For example, Eike found that older students tend have less perseverance than younger students, especially when engaged in formal leadership roles. There has also been research which argues that sustainability leaders require more than competencies, and also require practical skills, attitudes, motivation, dispositions among other qualities and skills (Pauw, et. al., 2015).

Courtice (2013) argues that sustainability thus far has been concerned more with the what and how. In the case of sustainability leadership, the research thus far can be characterized by

what. Little research has focused on how to create sustainability leaders, or why individuals engage in sustainability leadership. Even the research that does exist on SL, as is mentioned by Wiek, Withycombe, and Redman (2011), has seen very minimal amounts of empirical evidence, and research on if the competencies that sustainability leaders have are the limiting factors which lead to engaging in sustainability leadership.

2.3: Sustainability Education

While education towards sustainability has become standard across the globe, research on its effectiveness and effects are limited (Pauw, et. al., 2015). The research that has been conducted thus far is typically exploratory, qualitative, and only on smaller study populations, with limited empirical evidence. Education for sustainability is also divided between Environmental Education, which takes more of a ecocentric approach, and Education for Sustainable Development, which takes a more anthropocentric approach. This divide is part of the debate on what to teach to achieve sustainability, and what sustainability means. Other studies have focussed on not only the importance of what is taught but the institutional context within which the education takes place, and the influence this has on students. The findings of the research on educating for sustainability can be generalized as: education for sustainability is complex, is influenced by a wide range of factors, and is contentious.

While some studies have found that increased knowledge on sustainability issues leads to feeling less responsible, and less concerned (Kellstedt, Zahran, & Vedlitz, 2008), other longer term studies have shown the opposite to be true (Milfont, 2012). While this debate may be an issue for positive environmental actions, such as composting, for sustainability leaders, knowledge on sustainability issues is a necessity. Sustainability leaders require knowledge on the issues so that they can lead others towards a more sustainable future. Milfont makes the

distinction between different types of knowledge for sustainability issues, which is of relevance to sustainability leaders (ibid.). Milfont identified systems knowledge (understanding natural systems cycles and processes), action-related knowledge (knowing what can be done about issues), and effectiveness knowledge (knowing the benefits of what can be done) (ibid.). Arbuthnott adds that understanding how to bring about behaviour change is important for sustainability leaders, and that courses in social sciences should be included in education for sustainable development (2009). This can be defined as implementation knowledge, of how to implement solutions to sustainability issues.

The most important aspect of education for sustainability, according to several studies is that it must be action oriented (see Díaz-Siefer, et. al., 2015; and Stevenson, & Peterson, 2015). In a study on teenagers in South Korea, Choi (2016) argues that education is very similar to marketing, and for marketing to be successful it must link a problem to a solution. Choi found that while concern and hope positively correlate to more positive environmental behaviours, despair is negatively correlated (ibid.). Research in political science on political participation has found that perceived efficacy, and interest in political issues can determine involvement in politics, such as voting (Levy, & Zint, 2012). Díaz-Siefer, et. al. (2015) found that this also applies to environmental issues. This further demonstrates that while understanding the issues of sustainability is important, it is of little use if there is no knowledge on how to do something about it.

A growing amount of research is arguing that knowledge and competency based education is not sufficient, and that educating sustainability leaders must take a whole person approach, that includes affective aspects (Sipos, Battisti, & Grimm, 2008; Margaret Podger, Mustakova-Possardt, & Reid, 2010; Rimanoczy, 2014; Shephard, 2008; and Pauw, et. al., 2015).

Margaret Podger, Mustakova-Possardt, and Reid (2010) argue that engaging individuals' identity, motivation and higher order dispositions, will result in students that have a stronger will to learn and act on sustainability issues. Rimanoczy, (2014) identified the following areas, among others, that are useful for sustainability: personal mission (seeing a sustainability goal as a personal mission), knowing yourself (knowing one's values, beliefs and ideologies, and inconsistencies between those and actions/behaviours), and understanding the link between yourself and the natural environment. While teaching affective outcomes is often accused as brainwashing or indoctrination, Shephard (2008) argues that it has become normalized in certain fields, such as the health professions, as it is a required aspect of those fields.

2.4: Environmentally Significant Behaviour

Stern (2000) identified four types of environmentally significant behaviour: environmental activism, non-activist activities in the public sphere, private sphere environmentalism, and other environmentally significant behaviours. SL activities could fit into all four of those types of environmentally significant behaviour. However, Stern emphasizes that it is important to make this distinction because these different kinds of environmentally significant behaviours all have different predictors (ibid.). Nonetheless, commonalities exist between the four different types of action, and the research is significantly more established than research specifically on sustainability leadership. Research on environmental activism and pro environmental behaviours can contribute theories, and empirical evidence, which is lacking in research on sustainability leadership (Wiek, Withycombe, & Redman, 2011), and provide insight into why individuals engage in sustainability leadership. What follows is an examination of the theories that have emerged from research on why individuals engage in environmentally significant behaviour.

Theory of planned behaviour (TPB) predicts that individuals will engage in a behaviour if they intend to engage, and intentions are predicted based on an individual's attitudes, perceived behavioural control, and subjective norms. TPB has been found by multiple studies (Kollmuss, & Agyeman, 2002; Steg, & Vlek, 2009; Swim et. al. 2009; and Vining et. al., 2002) to have one of the best predictive powers, of any singular theory, in regards to environmentally significant behaviour. However, Steg, and Vlek (2009) found that TPB only was the most explanatory theory when the cost of engaging in environmentally significant behaviour was high. Additionally, Kollmuss and Agyeman (2002) recognize that TPB, while being the most widely used and accepted theory, is still not complete or entirely correct. For instance, attitudes must be towards a very specific behaviour to be accurate, for example towards riding a bicycle to work, at which point the theory becomes less useful (ibid.). Fielding, McDonald, and Louis (2008) found that perceived behavioural control was not statistically relevant compared to other variables for predicting involvement in environmental activism. Steg and Vlek (2009) further note the limitations of TPB by arguing that context is important to consider because it can: prevent action, make a behaviour easier or harder and change your motivations and goals.

While TPB behaviour is limited, and not entirely accurate, increasingly researchers believe that self and collective identity can be included in TPB to increase the accuracy and explanatory power of the theory (Fielding, McDonald, & Louis, 2008). In a study of 169 students in a sustainability conference, Fielding, McDonald, and Louis (ibid.) found that self and collective identity were associated with stronger intentions to engage in environmental activism. Dono, Webb, and Richardson, (2010) found that social identity (identifying with a social group, in this case environmentalist) predicted 60% of the variance in engagement in environmental activism, which is higher than other models used to predict activism. For positive environmental

behaviours besides environmental activism and are lower cost, social identity was less predictive (ibid.).

The trend to include identity in TPB mirrors the trend in social movement studies, which, to balance more structural theories (Goodwin, & Jasper, 1999), have included more social and identity based theories (Polletta, & Jasper, 2001). Polletta and Jasper define collective identity as:

> "imagined as well as concrete communities, [and] involve an act of perception and construction as well as the discovery of pre-existing bonds, interests, and boundaries. It is fluid and relational, emerging out of interactions with a number of different audiences (bystanders, allies, opponents, news media, state authorities), rather than fixed. It channels words and actions, enabling some claims and deeds but delegitimating others. It provides categories by which individuals divide up and make sense of the social world." (ibid., pg. 298)

Specifically, social identity helps answer why individuals join social movements (ibid.). People participate as part of upholding their reputation and creating a positive self-identity. This reputation is created through the participation in groups that has expectations that would vary dependent upon context. Collective identity can also explain why people leave social movements; because their personal identity no longer lines up with the collective identity or tactics, or their identity can line up better with a different movement or conventional politics. In relation to SL, this can bring the focus away from the individual, to some extent, and focus more on the community of sustainability leaders as a whole.

Along with social identity approaches, research has emerged from social movement studies that can be useful for understanding engagement in sustainability leadership. In a study of

students involved in the civil rights movement in the USA in the 1960's, McAdam postulated the stronger an individuals' network of ties to a movement, the more likely they are to engage (McAdam, 1986). According to McAdam this specifically applies to high cost, high risk activism, and is dependent upon the individual first being predisposed, in terms of attitudes, values and beliefs, to joining the movement (ibid.). McAdam's theory became known as micromobilization, and predicts involvement based on the ties to others in the movement, frequency of communication with other movement members, length of participation and identifying with the social movement (Tindall, 2008). In a study on the U.S.-Central American peace movement of the 1980's, Nepstad and Smith (1999), argued that while still being useful, McAdam's theory was limited as it did not fully account for human agency, and peoples' ability to overcome obstacles in becoming an activist if properly motivated. The significance to SL then is predicated upon it being high risk/cost but limited in not fully considering human agency.

Research on social movements has also examined issues such as the free rider problem in collective actions (Perrow & Olsen, 1973; Lubell, 2002). Lubell (2002) examined environmental activism as a collective action and argued that individuals participate when the value expected of participating is positive using the collective interest model. The collective interest model used in sociology and political science to explain protest participation, the value of participation is judged by individuals based on "the value of the public good, the probability their participation will affect collective outcomes, and the selective benefits/ costs of participation" (ibid., pg. 432). This approach is similar to resource mobilization theory, which emerged from rational choice theory (see Perrow & Olsen, 1973; McCarthy & Zald 1977; Finkel, & Muller, 1998). Theories such as this have been critiqued for being unable to explain individuals that engage in activism at a high risk/cost, which is better explained by social network theory examined previously (see

McAdam, 1986, Nepstad & Smith, 1999, Tindall, 2008). Involvement is likely influenced by both theories (collective interest, and social network theory) as has been found by a study which compared active members to non-active members of the Sierra Club (Manzo & Weinstein, 1987).

Biographical availability is another useful concept that has emerged from social movement studies. It refers to whether a person has many responsibilities and commitments which may prevent their involvement in a social movement. Beyerlein and Hipp (2006) found that biographical availability limits the willingness of people to participate in activism, but does not limit those already willing to participate from participating. This explains previous findings that being involved in social movements is not predicated upon being biographically available (Barkan et. al., 1995; Passy & Giugni, 2001; Wiltfang & McAdam, 1991), and that some studies have found that biographical unavailability even increases the chance of being involved (McAdam 1986; Wiltfang and McAdam 1991). Other studies have found however that biographical unavailability does limit involvement in environmental activism, but not private sphere environmentalism, such as recycling (Tindall, Davies, & Mauboules, 2003).

Chapter 3: Methods

3.1: Introduction

To answer the study's research question of "what are the reasons sustainability students engage or do not engage in sustainability leadership" a mixed methodology will be used. A quantitative survey will be used in addition to qualitative interviews. The purpose of the survey will be to broadly characterize, provide context to the interviews, and will be a selection process for the interviews. The interviews will be used to characterize reasons for engagement in SL and explore the relationship between sustainability students, the ESS program, and SL and gain a more nuanced understanding. With these results the study will be able to identify potential reasons why students engage in SL.

3.2: Population

The population of this research is students studying in sustainability programs with the purpose of generating and preparing Sustainability Leaders. This study will focus on students enrolled in the ESS program at Dalhousie University in Nova Scotia, Canada. The program has approximately 400 students total enrolled in its core courses across 4 years of study. The program has existed since 2008 and requires students to combine ESS with another major. Roughly 30-40 students graduate from the program each year with ESS as their primary major, additional students take ESS as their secondary major.

3.3: Procedure

After receiving ethics clearance (ethics approval letter can be found in appendix A) and permission of the College of Sustainability at Dalhousie (College approval letter can be found in appendix B), a physical copy of the survey was distributed to students in ESS classes and were given class time to complete the survey (survey questions can be found in appendix C). The

survey included a consent form which included a short summary of the purpose of the research, and contact information of the researcher. There was no incentive for completing the survey other than contributing to knowledge on SL. Students were informed about the purpose of the study, the time commitment required (5-10 minutes), and the opportunity to ask any questions of the researcher. Following the survey, interview participants were contacted, and a time and location suitable for the interview participant was selected. Participants were given the option for the interview to be conducted over the phone. Interview participants signed a consent form giving permission to be recorded, and for non-identifying quotes to be used. Interviews lasted approximately 30 minutes, after which participants were given the opportunity to discuss the initial survey findings of the research.

3.4: Survey

The survey was created based on research explored in chapter 2 and included questions drawn from Theory of Planned Behaviour, Identity Theory, Social Network Theory, and Biographical Availability. Questions were adapted to make the questions relevant for SL and this study from studies by Fielding, McDonald and Louis (2008), Tindall, Davies and Mauboules (2003), Dono, Webb, and Richardson (2009) Beyerlein and Hipp (2006) and Eike (2014). Questions 3-15 were adapted from Fielding, McDonald and Louis' 2008 study on environmental activism using Theory of Planned Behaviour, and identity theory. Questions 18 and 19 were adapted from Tindall, Davies and Mauboules' 2003 study on environmental activism using social network theory. Following the recommendations of Dono, Webb and Richardson (2009), engagement in SL was measured on a continuous scale for questions 20-22. Question 23 was generated based on research on biographical availability (see Tindall, Davies & Mauboules, 2003; and Beyerlein & Hipp, 2006). Question 24 was drawn from research on

student leadership towards sustainability conducted by Eike (2014). The other questions were created to gather relevant information about students' engagement in SL. The survey included a short summary of the purpose of the study, a definition of SL, requested contact information, and permission to be contact for an interview. Participants were requested to read the consent form and then answer the questions. The survey questions used can be found in appendix C. A table of how the predictors used in chapter 4 were generated can be found in appendix D.

3.4.1: Sampling

All students that attended the class on the day the survey was distributed were provided a survey. The classes selected were the ESS classes offered in the winter semester of 2017. This included: SUST 1001 (Introduction to Environment, Sustainability & Society 2), SUST 2001 (Environment, Sustainability and Governance: A Global Perspective), SUST 3502 (The Campus as a Living Laboratory), SUST 3952 (Global Coastal Change & Management) and SUST 4000 (Environment, Sustainability & Society Capstone). It was assumed that those in the first-year class were first year students, and so on except for the elective SUST 3952 whose results were kept separate and appear as elective in the results chapter. This was done as SUST 3952 is not a required course for the ESS program and students from different years of study and programs take the course. 130 total responses to the survey were collected with 91 of those responses indicating they intend to, or are taking ESS as their major. SUST 1001 had 35 responses, SUST 2001 had 8 responses, SUST 3502 had 50 responses, SUST 4000 had 18 responses, and SUST 3952 had 19 responses.

3.4.2: Plan for analytics

The survey data was analyzed for central tendencies in addition to simple bivariate regressions comparing levels of engagement in SL to the predictors found in appendix D. Data was separated by year of study and by responses to survey question 1 (survey questions can be

found in appendix C) to separate students taking ESS as a major, versus those in other programs. Averages for each year of study and alumni were calculated separately to determine trends across years of study.

3.5: Interviews

The interviews were semi-structured to explore reasons why participants engage or do not engage in SL. The interview guide used can be found in appendix E. Interview questions were derived from the research questions presented in chapter 1 and literature review presented in chapter 2. The purpose of the interviews was to determine if the predictors used in the survey were merely correlated to engagement in SL, or if students engaged due to the predictors found from the survey to correlate to engagement in SL. Additionally, the interviews provided context and nuance to the findings from the survey and allowed for reasons for engagement not included in the survey to emerge. If interview results are similar to survey results, the reasons for engagement are likely causally related to engagement in SL, while if interview results differ from survey results, the reasons for engagement from the survey are merely correlated.

3.5.1: Sampling

Purposive sampling, where participants are selected for a reason, was performed to select the participants for the interviews. The selection process was based on the results from the survey. The two students from each year of study who scored the highest average engagement in SL (calculation can be seen in appendix D) and that provided permission to contact for a follow up interview, were emailed requesting an interview. If respondents did not wish to do an interview, or did not respond to the request within one week, the individual with the next highest score would be selected until a participant could be found for the survey. The reason for this sampling method was that students engaged in SL can provide answers why they became

involved in SL, while those not engaged would only be able to speculate. In total 14 students were contacted for an interview, of the 8 that responded to the email requesting an interview, 6 interviews were scheduled, and 4 interviews occurred.

3.5.2: Plan for analytics

Interviews were coded using a posteriori coding to generate potential answers to the research questions. The research questions were used as an organizing structure for generating the codes, with codes assigned to any answer to the research questions. After coding the results were compared to the other interviews to refine the codes and then compared to the survey findings, and literature presented in Chapter 2.

3.6: Validity and Assumptions

To determine why individuals engage or do not engage in SL, only students who engage in SL were examined in detail during the interviews. The reasoning behind this was that by determining the reasons why individuals engage in SL, it can be deduced that those that do not engage do so because they do not satisfy those reasons. This assumption was minimized by ensuring that interview questions attempted to expand upon reasons for engagement, and determine how the reason supported the participant's engagement in SL.

A critical assumption in the survey design was that self reported SL was an accurate measure of actual behaviour. While actual behaviour is likely not identical to self reported behaviour, similar studies also use this method of measuring a behaviour (Dono, Webb, & Richardson, 2010). It is outside of the scope of this study to measure actual engagement in SL.

The interviews have the risk that participants feel uncomfortable to share answers to questions. This will be minimized since the researcher is a current student in the ESS program, which allows for a connection and understanding with participants. Research has shown that the

researcher's role as a fellow student provides the advantage of trust and familiarity with the research subjects, which can allow for better answers to questions (Burgess, 2006). While the researcher's position as a student allows for greater access to the research population it can also introduce significant bias to the research, especially the interviews. This will be avoided by asking only broad questions, not providing any opinions, and allowing the participant to lead the conversation.

Chapter 4: Results

4.1: Introduction

The findings of the survey and interviews are presented in this chapter. Each section focuses on one of the research questions, presenting the relevant findings of both the survey and the interview. The first section focuses on the research question: what are the reasons for engaging in SL? The second section focuses on the research question: how do students perceive the effects of the ESS program on their ability and/or motivation to engage in SL? The third section focuses on the research question: What barriers exist to engaging in SL? The fourth section focuses on the research question: What qualities or experiences correlate to SL? The research question on what theories are relevant to engagement in SL is answered throughout each section.

The survey had 130 respondents and the analysis results can be seen in Table A, B and C. Survey data was analyzed using bivariate regressions and central tendencies. Four interviews were conducted with students in the ESS program at Dalhousie university. Interviews were coded using a posteriori codes using the research questions as a guide.

Table A: Bivariate Regressions of Predictors for SL

		Adjusted R^2						
		All Data	ESS	1st Year	2nd Year	3rd Year	4th Year	Elective
Predictor	Perceived Time Availability	0.062	0.024*	0.015*	0.12*	0.11	-0.047*	0.046*
	Attitudes towards SL	0.085	0.017*	0.015*	-0.15*	0.033*	0.15*	0.49
	Perceived Norms	0.055	0.014*	0.0041*	-0.17*	0.16	0.19*	-0.054*
	Perceived Behavioural Control	0.12	0.11	-0.029*	0.83	0.088	0.060*	0.39
	Personal Connections	0.12	0.13	0.059*	0.53	0.097	0.15*	0.22
	Professional Connections	0.52	0.48	0.37	0.93	0.55	0.84	0.45
	Identity	0.33	0.22	0.19	0.52	0.48	0.31	0.19
	Formal Leadership Experience	0.20	0.20	-0.018*	0.25*	0.33	0.058*	0.17
	Perceived Program Efficacy	0.023	0.0027*	0.014*	0.31*	-0.012*	0.22	0.10*
	Perceived Community Efficacy	0.026	-0.0068*	0.00070*	-0.066*	-0.014*	0.075*	0.12*
	Intentions to engage in SL	0.42	0.36	0.61	0.61	0.35	0.22	0.47
# Responses		130	91	35	8	50	18	19

*P value>0.05 *More information on predictors used can be found in Appendix D*

Table B: Engagement in Different Types of SL

	Percentage of students engaged in types of SL activity						
Activity	**All Data**	**ESS**	**1st year**	**2nd year**	**3rd year**	**4th year**	**Elective**
Inspiring	68%	71%	60%	88%	66%	67%	68%
Initiating	10%	8.7%	2.9%	0%	10%	17%	16%
Supporting	69%	75%	66%	88%	60%	83%	68%
Donating money	27%	30%	20%	25%	30%	33%	21%
Activism	38%	43%	46%	13%	34%	44%	32%
Protesting	34%	38%	40%	38%	24%	39%	37%
Organizing activist activities	15%	19%	11%	13%	10%	33%	16%

Results from survey question 16. Survey questions can be found in Appendix C

Table C: Central Tendencies of Survey Results

		All Data	ESS	1st year	2nd Year	3rd Year	4th Year	Elective
Perceived time availability*	Mean	3	3.1	3.1	3	2.9	3.2	3
	Median	3	3	3	3	3	3	3
	Mode	4	4	3	3	4	4	4
Attitudes towards SL*	Mean	4.4	4.4	4.5	4.3	4.2	4.5	4.4
	Median	4.5	5	5	5	4	5	4
	Mode	5	5	5	5	4	5	5
Perceived Program Efficacy*	Mean	4	4	4.2	4	3.7	3.8	4.2
	Median	4	4	4	4	4	4	4
	Mode	4	4	4	4	4	4	4
Perceived Community Efficacy*	Mean	4	4.1	4.1	4.2	3.8	3.9	4.3
	Median	4	4	4	4.5	4	4	4
	Mode	4	4	4	5	4	5	4
SL**	Mean	3.5	4.2	3.6	4.0	3.8	4.8	3.9
	Median	2	4.1	3.7	4.5	3.4	5.1	3.7
#Responses		130	91	35	8	50	18	19

*measured on a 5 point scale with 5 being positive
**measured on a 7 point scale with 7 being positive

4.2: Engagement in Sustainability Leadership

This section focuses on the main research question of: what are the reasons for engaging in SL? Both the survey and interview results indicate that micromobilization theory is the most useful theory for understanding and predicting engagement in SL. Micromobilization theory predicts that engagement is a two-stage process: first an individual must have the right values and attitudes about an action, and then subsequently engagement increases when individuals have social networks that include others involved in the action (for more information see chapter 2). From the survey results it seems having professional relationships, predicting 52% variance, has more predictive power as opposed to personal relationships, predicting only 12% variance. Professional relationships had a higher predictive power of current engagement than intentions to engage in SL in the future which predicted only 42% of variance. Professional relationships were measured using the following question: *How often do you talk to someone about your engagement in sustainability leadership activities?* Personal relationships were measured using

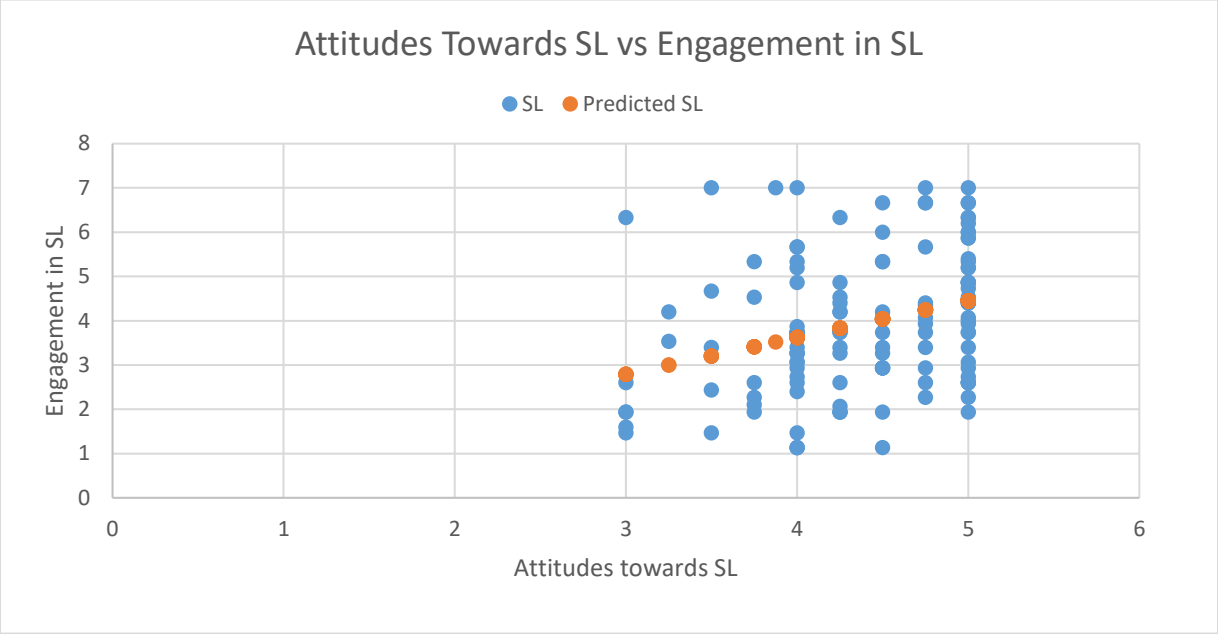
the following question: *I know ____ people who engage in sustainability leadership who I can engage in a casual conversation.* Intentions to engage in SL in the future was measured using the following question: *Do you intend to engage in sustainability leadership in the next 6 months?* Other theories such as Theory of Planned Behaviour, and Identity Theory has less predictive power.

The limitation of the survey in understanding the relationship between social networks and engagement in SL, is a chicken or egg dilemma; what came first? Did the social network only develop when already engaged in SL, or did social networks help in initially getting involved in SL. The interviews can provide insight into just that, what came first. Interviewees all mentioned other people as critical in the reasons they became involved in SL. One interviewee became involved in a group involved in SL when a friend invited her to join. Another respondent noted the support afforded by a network can help in getting started on an initiative: "sometimes we have a lot of ideas but aren't exactly sure where to start, so having a network and other people [to support you] makes a huge difference". All interview participants focused mostly on professional relationships and resources that the University and other groups and organizations offered. The ESS blog, professors, the Ecology Action Centre, and Leadership Conferences, were mentioned as ways that participants became involved or more involved in SL. Developing a network of professional connections to those engaged in SL seems to both initially encourage engagement in addition to leading to more engagement in SL. As stated by on participant "you broaden your circles" and "then you go to their events". Of particular interest was one participant who was much more engaged before coming to university. As they explained one of the reasons they used to be more engaged was "because I [had] those connections" where

they were living before. In coming to Halifax, they “didn’t find any [groups] that clicked” and became “much less engaged”.

The interviews also corroborated the two-stage nature of becoming engaged as theorized by micromobilization theory. As one participant stated “if the interest didn’t exist then obviously, [sustainability leadership] wouldn’t happen” and another attributed “that underlying passion and love” to why they became involved in sustainability leadership. The survey results however did not show a significant relation between attitudes about SL and engagement in SL, predicting only 8.5% of variance. This could demonstrate the two-stage nature of becoming involved in SL, first you need the attitudes and values, but without the social network, attitudes and values alone are not enough to become engaged. The lack of predictive power of attitudes could also be due to the population all generally having positive values and attitudes towards SL. Table B, shows the distribution of attitudes towards SL compared to engagement in SL and demonstrates this negative skew. The mean attitude towards engaging in SL was 4.4 out of 5 and the mode was 5 out of 5, meaning most students found engaging in SL very wise, very beneficial, very pleasant, and very favourable (for question these results are based on see appendix C, question 3).

Graph A: Attitudes Towards SL vs Engagement in SL



Two of the interview participants mentioned their upbringing as an important reason for their engagement in SL. These participants mentioned the community in which they grew up: "The area that I am from…it's more weird to say you don't compost". Additionally, they mentioned the important role their parents played in encouraging their engagement in SL, "my parents were a huge influence on [my engagement]", this led to a belief that SL has "always just been the natural thing to do". However, the other interview participants did not mention their upbringing or their parents as a reason they engage in SL. One participant stated that those closest to them are "a little confused when you say sustainability" but "they think it's interesting". The survey findings indicate perceived norms only predict 5.5% of variance in SL engagement.

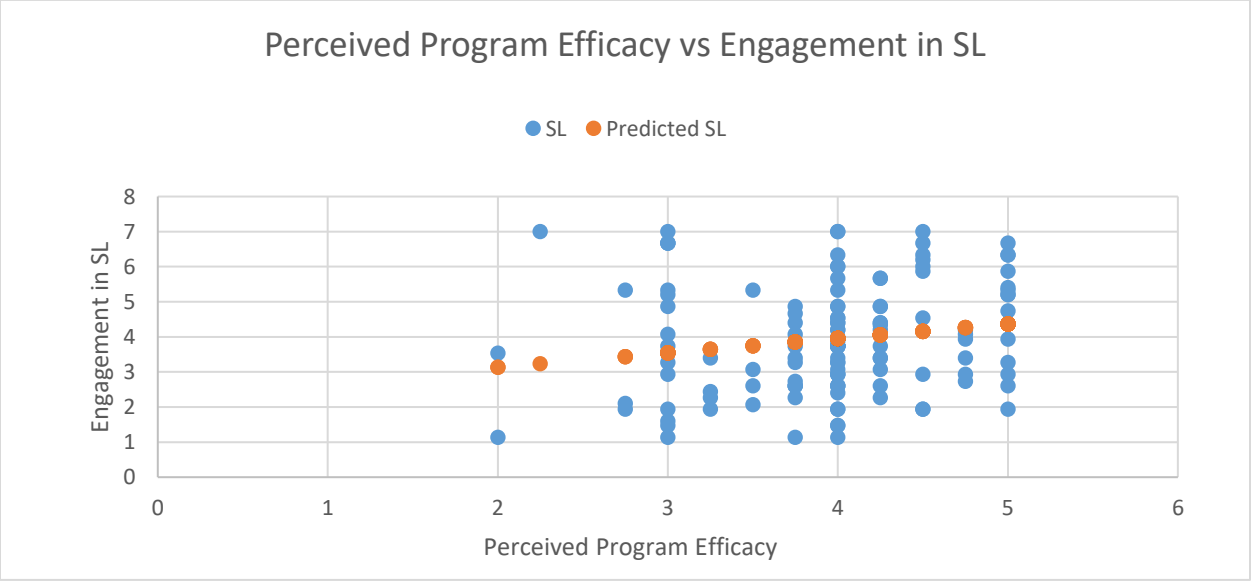
The results of the interviews also generated themes of engagement not measured on the survey. One participant stated that they engage more when they can see the positive impact they are having. They mentioned "it can be really empowering to see just how much can be

accomplished" and that "seeing the ripples can be so rewarding". Another participant attributed increased engagement to being a part of the ESS program at Dalhousie, because it "keeps the issues on the forefront". Another participant attributed their passion for sustainability leadership to experiences in nature: "being humbled by nature… [you realize] I am just a small thing in the big picture". These reasons for engagement in SL were not mentioned by the other interview participants.

4.3: Environment, Sustainability, & Society Program

This section focusses on the research question: how do students perceive the effects of the ESS program on their ability and/or motivation to engage in SL? The survey results show perceived program efficacy did not correlate to SL engagement, predicting only 2.3% of variance. As with attitudes towards SL, however, the average perceived program efficacy was high with a mean of 4 out of 5 with 5 being positive. Graph B demonstrates this negative skew and could indicate that the program is not a limiting factor for SL engagement because it is sufficiently effective.

Graph B: Perceived Program Efficacy vs Engagement in SL



Interviews revealed the complexity of the relationship between engagement in SL and the ESS program. Three out of four respondents had mixed feelings about the program, with the other student only feeling positively. What all interview participants mentioned was that they learned different ways to approach and understand sustainability and that this led to more engagement. As stated by one respondent, "before I started the program I always just thought sustainability was… more of a hippie idea… [but] once you get in the program you realize there's so many ways to approach [sustainability]". Originally this student took an ESS class as an elective, but learning about different approaches to sustainability led them to taking it as their major. Two of the interview participants used connections of Dalhousie's College of Sustainability to get internships.

Comparing students in different years of study indicates there is no significant difference in perceived program effectiveness, perceived community effectiveness, and attitudes towards sustainability across the different years of study. Although there is not enough data to be definitive, SL was highest among 4th year students. Students in the ESS program did have a higher engagement in SL, with the mean for all responses at 3.5 and a mean for ESS students at 4.2. Comparing the correlation between various predictors across years of study is challenging due to the sample size of some of the years of study, but having professional relationships had the strongest correlation across most years. The type of engagement in SL, as seen in Table B, did not differ significantly between years. Inspiring others to be more sustainable, and supporting groups engaged in SL were the most common ways to engage in all years of study.

From the interview results, it seems the ESS program affects the type and quality of engagement more than the quantity of engagement. One participant said "in first year I was in all the things" but they mentioned that due to the ESS program they have been focusing more on

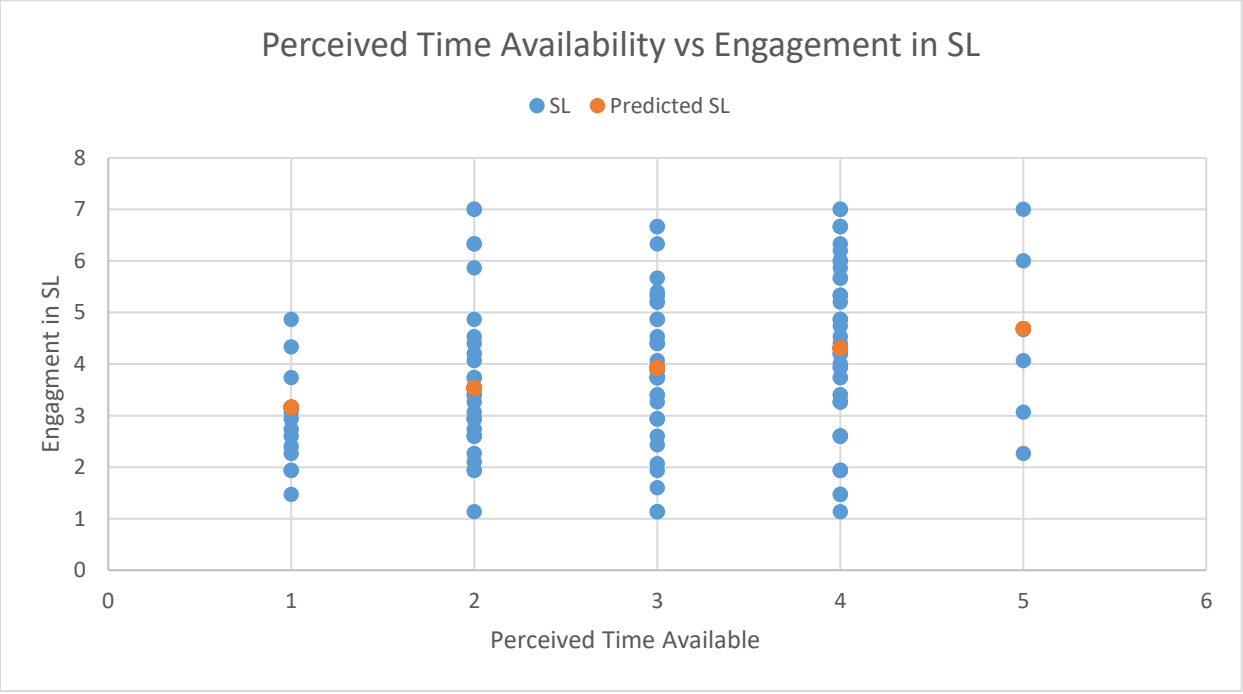
"doing fewer things well". In their opinion "if you are doing all the things you are just putting band-aids on things. If you heavily think about something and engage with it, you are going to be more impactful". Having more knowledge and skills does not necessarily lead to less engagement per se, as two other respondents mentioned that they engage more as they learn more. It seems the type of engagement changes to become more focused and analytical, and integrate a broader perspective gained by the ESS program.

Two of the respondents brought up weaknesses of the ESS program. One participant focussed on the lack of capacity of the ESS program and the College of Sustainability to support student projects. Additionally, they noted that they "started seeking [their] engagement outside of the university community… [they were] just really bored with how universities are insular and how projects aren't challenged". This lack of challenging ideas and projects was also mentioned by another participant, they felt that to engage in SL "you can't be comfortable all the time" and that the ESS program did not encourage students to challenge their ideas and beliefs enough. This participant also felt that the ESS program needed to focus more on academic skills. In their opinion the ESS program has "too much emphasis on making communities and sustainability leadership without actually being willing to put in that hard work for the academic aspect of [university]". This interview participant noticed "students in [ESS] classes who are leaving and saying I have no idea how to do anything to do with stats". The interviewee compared this to other programs which require an entire semester just on quantitative research methods and an entire semester just on qualitative research methods. Since survey findings indicate the perceived program efficacy has no correlation to engagement in SL, it is likely that this affects the quality of SL rather than if students engage in SL.

4.4: Barriers to Engagement

This section focuses on the following research question: what barriers exist to engaging in SL? Surprisingly, survey findings indicate that time availability does not significantly correlate to levels of engagement, predicting only 6.2% of variance. The survey question used for this analysis was: *I feel I have enough time to engage in sustainability leadership*. Responses were measured on a 5-point scale (1 being strongly disagree to 5 being strongly agree). The interviews, however, suggested that time could be a barrier to engagement. As stated by one interviewee, "I don't have time to go to other people's events". As can be seen in Graph C, it appears that only those that strongly perceive they do not have enough time, engage less in SL. All interview participants mentioned lack of time as a barrier to them being engaged, yet interview participants were selected due to their high levels of engagement in SL. Perceived time available did not change significantly across years of study. It is likely that time availability does affect engagement in SL, but not to a significant degree.

Graph C: Perceived Time Availability vs Engagement in SL



Two interviewees mentioned that not being taken seriously, and having their time and experience valued and being respected was a barrier to engaging more. As stated by one interviewee, "students are intelligent and smart…but people look down on your ideas…and you don't get treated seriously". This aligns with collective action theory, and it appears that the incentive that prevents free riding is feeling like one is making a difference. As stated earlier, one of the interviewees mentioned that "it can be really empowering to see just how much can be accomplished" and "seeing the ripples can be so rewarding". It stands to reason then that if students are not taken seriously and allowed to make a difference it is barrier to engagement.

Three of the interview participants observed that not feeling comfortable enough to approach groups, start initiatives and put yourself out there, can be a barrier to engagement. Additionally, one participant found that they were unable to "find any [groups] that clicked" and that this prevented them from being more engaged. The survey found that those involved in groups had a higher mean engagement in SL of 4.6 than the mean of 3.4 for those not involved in groups. Similarly, another participant found that knowing only about the issues but not potential solutions was a barrier to engagement. This reflects the reason for engaging that three of the interviews expressed, that learning about different ways and groups to be engaged in leads to more engagement.

4.5: Qualities and Experiences

This section focuses on the following research question: *what qualities or experiences correlate to sustainability leadership?* Having formal leadership experience did not have a strong correlation to engagement in SL predicting only 20% of variance. While having formal leadership experience was not mentioned as a reason for being engaged by any of the interview participants, 3 of the participants mentioned that it is important to have the drive to put yourself

out there and seek the opportunities to become involved. One participant mentioned that “you can’t be comfortable all the time” and must be willing to challenge yourself. Therefor, it could be that gaining experience and confidence through holding a formal leadership position could lead to more engagement.

As mentioned previously, two of the interview participants attributed their engagement in SL in part to their upbringing and parents. Similarly, all of the interview participants emphasized the importance of mentors and role models. One participant said, “mentorship is so important and I don’t think there is enough of it”. Another participant found that having professors present opportunities to become more involved in SL led to more engagement in SL. Similarly, one participant found that being involved in groups that engage in SL not only led to increased engagement through the group activities itself, but also through being connected to other groups, and people. The main theme of qualities and experiences that increase engagement in SL can be summarized in a two-step process: first being willing to put yourself out there and challenge yourself, and second meeting people and learning about more opportunities and ways to become involved.

Chapter 5: Discussion

5.1: Engagement in Sustainability Leadership

From both the survey findings and interviews micromobilization theory has the most explanatory power for engagement in SL. The interviews especially suggest the two-stage nature of micromobilization theory for engagement in SL. The first step is having the right attitudes, values and beliefs towards engaging in SL. For the second step this attitude must be converted into action through learning about ways to engage, and meeting others that can connect and encourage them to engage. While attitudes towards SL only predicted 8.5% of variation in engagement in SL, having the right attitudes, values and beliefs towards SL was considered an important reason for engagement by all interview participants. The mechanism for both steps can differentiate from case to case. For some the attitudes, values, and beliefs come from their upbringing, while for others it is having experiences in nature, or learning about the issues. The second stage of converting passion into action, seems to be primarily affected by professional type relationships rather than personal relationships. Survey findings found that conversations about engaging in SL, had a significantly higher correlation to engaging in SL, than being able to engage others engaged in SL in a personal conversation. What follows from this second step is that it is critical for prospective sustainability leaders to be willing to put themselves out there and challenge themselves. Additionally, learning about the issues of sustainability and opportunities to become engaged can increase engagement in SL. This is supported by the findings of the interviews.

5.2: Environment, Sustainability, & Society Program

In terms of getting students engaged in SL the resources the university has appeared to be

more important than the class content. The survey did not find a strong correlation between the perceived efficacy of the ESS program, and levels of engagement in SL. The interview participants, did not mention specific class content as to why they became engaged. Three of the participants did mention resources and connections that the University provided which led to their engagement in SL. Comparisons between different years of study was not possible due to the small sample size of some of the years of study. While engagement in SL was highest among 4th year students, the interview results suggested that what changes over the course of the ESS program is how students engage in SL, as opposed to how much students engage. The way the class content can be most effective then is for classes to focus increasing the quality of engagement in SL by teaching critical thinking, systems thinking, analytical thinking, in addition teaching different ways to become involved in SL. To compliment this by increasing the quantity of engagement, resources for further engagement should be offered outside of classes to provide students the opportunity to become more involved. As identified by Cress, et. al., (2001) and Rosch, & Caza, (2012) this can lead to students becoming more effective in leadership.

5.3: Comparison to Literature

5.3.1: Sustainability Leadership

This research compared to existing literature on SL (Eike, 2014; Schwalb, 2011; Wiek, Withycombe, & Redman, 2011; Visser & Coutice, 2011; and Courtice, 2013), shows that for increasing engaging in SL, competencies and characteristics are not as important as social networks. The only characteristics that surfaced from this research as important to increasing engagement, was a willingness to challenge oneself, and put oneself out there. Further research will need to be conducted to determine if skills and competencies lead to more effective SL, and how to increase individuals' willingness to challenge themselves and put themselves out there.

This research provides a first step in filling the gap in research on SL, by studying what leads to engagement, but further research will still be needed on what leads to engagement in SL, and what makes for effective SL.

5.3.2: Sustainability Education

Similar to research on SL, research on Sustainability Education has focused on what skills are required to engage in SL, rather than what leads to engagement. While this focus of teaching skills and knowledge may lead to better quality engagement, my research has shown that providing opportunities to become engaged, and having being connected to networks of people engaged in SL, is more important for increasing engagement in SL. This is in line with findings by Díaz-Siefer, et. al. (2015), and Stevenson, & Peterson (2015), that it is important that education is action oriented. Additionally, as identified by Cress, et. al., (2001), Rosch, & Caza, (2012) and Ingleton, (2013) this can also lead to more effective leadership. This fills part of the knowledge gap identified by Pauw, et. al. (2015), that there is no empirical evidence for what leads to increased engagement and increased effectiveness in SL. This study is limited however due to the sample size as it did not allow for comparison between years of study, or examine changes that occur to students as they study in the program.

5.3.3: Environmentally Significant Behaviour

Drawn from research on social movements, Micromobilization theory, had the most predictive and explanatory power for engagement in SL. Theory of Planned Behaviour (TPB) had less predictive power. Like Fielding, McDonald, and Louis (2008) the survey results indicate that perceived behavioural control was not statistically relevant compared to other variables, in predicting involvement in SL. Despite the survey finding that perceived norms did not strongly predict engagement in SL, interview responses demonstrated the importance of perceived norms,

as one of the potential mechanisms to generate the prerequisite attitudes, beliefs and values to engage in SL. Although unlike Kollmuss, & Agyeman (2002), Steg, & Vlek (2009), Swim et. al. (2009) and Vining et. al. (2002), studying environmentally significant behaviour, TPB overall did not have strong predictive power for SL. However, Steg, and Vlek (2009) found that TPB only was the most explanatory theory when the cost of engaging in environmentally significant behaviour was high. Engagement in SL seems to have a high cost, especially when compared to other forms of environmentally significant behaviour, such as recycling, but differs from personal behaviour changes as it heavily involves others. This could be why social network theory has more explanatory power, as SL must include other people, while environmentally significant behaviours do not necessarily involve others. Alternatively, TPB could have less explanatory power, as the attitudes, perceived norms, and perceived behavioural control needed are only the first step, while having a social network is what converts this passion into action. Collective action theory was an important factor for two of the interview participants, especially in terms of needing to feel valued, and that they are making a difference, for individuals to overcome the issue of free riding.

5.4: Conclusion and Recommendations

When I started this research, I had a conversation with a fellow ESS student who said something to the effect of: “why bother researching this, isn’t it obvious? Students don’t engage in sustainability leadership because they don’t have enough time”. What has emerged from this research is that engagement in SL is a far more nuanced subject than this initial conversation would have suggested. While further research will be needed to confirm and expand upon the findings of this research, it seems that having a network of people also engaged in SL is the best predictor of engagement in SL. It would be especially valuable to continue studying this topic

with larger sample sizes and across multiple years so that the effect that sustainability education has on engagement in SL can be better understood. What my research demonstrates, is that the factors that this research has found influence engagement in SL, are often not directly addressed in research or education programs on sustainability. Finally, empirical research is needed on what makes SL effective in achieving positive changes towards a more sustainable society. Ultimately, while the first step is having people engaged, it is of little relevance if no substantial changes are made towards achieving a more sustainable society.

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Appendix A: Ethics Approval Letter

DALHOUSIE UNIVERSITY
Research Services

Social Sciences & Humanities Research Ethics Board
Letter of Approval

March 02, 2017

Mr Evan Groen
Arts & Social Sciences\Sociology & Anthropology

Dear Evan,

REB #: 2017-4097
Project Title: Leading Change: Student Engagement in Sustainability Leadership

Effective Date: March 02, 2017
Expiry Date: March 02, 2018

The Social Sciences & Humanities Research Ethics Board has reviewed your application for research involving humans and found the proposed research to be in accordance with the Tri-Council Policy Statement on *Ethical Conduct for Research Involving Humans.* This approval will be in effect for 12 months as indicated above. This approval is subject to the conditions listed below which constitute your on-going responsibilities with respect to the ethical conduct of this research.

Sincerely,

Dr. Karen Beazley, Chair

Appendix B: College Permission Letter

DALHOUSIE UNIVERSITY

January 24, 2017

Research Ethics Office
Dalhousie University

Letter of Support for Evan Groen's proposed research project – "Leading Change: Student Engagement in Sustainability Leadership"

I am pleased to provide this letter of support for Evan Groen's proposed ESS Honours Thesis research project, and in specific to affirm that the College is supportive of the aspects of this research involving College students and graduates. We feel this research will make a substantial contribution to the literature on student leadership, activism and social change, and that the risks to participating individuals are minimal. We also feel that the research involves minimal reputational risk to the College and its programs, and that these risks are more than offset by the potential benefits of the results.

We will assist Evan in recruiting research subjects by sending the recruitment emails to our student and graduate lists. Subjects will contact Evan by opting in on the basis of these messages. We will also provide other support (Opinio account access, recording devices, etc.) as needed.

We look forward to the results of this study.

Sincerely,

Steven Mannell, Director, College of Sustainability

COLLEGE OF SUSTAINABILITY
Mona Campbell Building | 1459 Le Marchant Street, Suite 1401 | PO Box 15000 | Halifax NS | B3H 4R2 CANADA
902.494.4581| FAX: 902.494.8923 | DAL.CA/sustainability

Appendix C: Survey Questions

1) Do you intend to or are you currently taking Environment, Sustainability, and Society as one of your majors?

Yes No Unsure

2) Do you intend to or are you currently taking Environment, Sustainability, and Society as a minor?

Yes No Unsure

(For the following 3 questions please circle 1 from each line, 12 circles total)

3) I think that engaging in sustainability leadership is:

Very foolish	Foolish	Neutral	Wise	Very wise
Very harmful	Harmful	Neutral	Beneficial	Very beneficial
Very unpleasant	Unpleasant	Neutral	Pleasant	Very pleasant
Very unfavourable	Unfavourable	Neutral	Favourable	Very favourable

4) For my engagement in sustainability leadership, ESS class content is:

Very unsupportive	Unsupportive	Neutral	Supportive	Very supportive
Very unpleasant	Unpleasant	Neutral	Pleasant	Very pleasant
Very useless	Useless	Neutral	Useful	Very useful
Very uninspiring	Uninspiring	Neutral	Inspiring	Very inspiring

5) For my engagement in sustainability leadership the community of ESS students are:

Very unsupportive	Unsupportive	Neutral	Supportive	Very supportive
Very unpleasant	Unpleasant	Neutral	Pleasant	Very pleasant
Very useless	Useless	Neutral	Useful	Very useful
Very uninspiring	Uninspiring	Neutral	Inspiring	Very inspiring

6) If I engaged in sustainability leadership people who are important to me would:

Strongly disapprove Disapprove Uncertain Approve Strongly approve

7) Most people who are important to me think that engaging in sustainability leadership is:

Very undesirable Undesirable Neutral Desirable Very Desirable

8) How much control do you have over whether you engage in sustainability leadership?

Very little control A little control Some control A fair amount of control A great deal of control

9) For me engaging in sustainability leadership is:

Very difficult Difficult Neutral Easy Very Easy

10) It is mostly up to me whether I engage in sustainability leadership.

Strongly disagree Disagree Uncertain Agree Strongly Agree

11) I intend to engage in sustainability leadership during the next 6 months.

Extremely unlikely Unlikely Uncertain Likely Extremely likely

12) Do you intend to engage in sustainability leadership in the next 6 months?

Definitely do not Do not Uncertain Do Definitely do

13) I think of myself as an sustainability leader.

Strongly disagree Disagree Uncertain Agree Strongly Agree

14) To engage in sustainability leadership is an important part of who I am.

Strongly disagree Disagree Uncertain Agree Strongly Agree

15) Are you currently a member of a group involved in sustainability leadership? If yes which one(s)?

_____

_____

16) What kind of sustainability leadership activities do you engage in? (please select all that apply)

Inspiring others to be more sustainable
Starting new groups and organizations
Supporting groups
Donating money
Activism
Going to protests
Organizing activism activities
Other:_____

_____

17) How is your time engaging in sustainability leadership distributed?

Inspiring: _____%
Initiating: _____%
Supporting: _____% Total = 100%

18) I know _____ people who engage in sustainability leadership who I can engage in a casual conversation.

Very few a few some many Very many

19) How often do you talk to someone about your engagement in sustainability leadership activities?

Once per month or less Once every few weeks Once a week Once every few days Everyday

20) I engage in sustainability leadership _____.

Almost never 1 2 3 4 5 6 7 All the time

21) How often have you engaged in sustainability leadership in the last 6 months?

Never 1-2 times 3-4 times 5-6 times 7 times or more

22) On average engaging in sustainability leadership occupies ____ hours per week.

0 1 2 3 4 5 >5

23) I feel I have enough free time to engage in sustainability leadership.

Strongly disagree Disagree Uncertain Agree Strongly Agree

24) Do you occupy any of the following leadership positions in any group or organization you are a part of? (does not have to be related to sustainability)

Founder (or similar)
President (or similar)
Vice President (or similar)
Other elected officer position (or similar)
Representative (or similar)

25) Permission to contact for follow up interview: (please circle)

NO YES

If yes,
Name:
Email:

Appendix D: Predictors of Sustainability Leadership

Predictor	Basis in Literature	Survey Questions	Calculation
Perceived Time Availability	Tindall, Davies & Mauboules, 2003; and Beyerlein & Hipp, 2006	23	Score of 1-5
Attitudes Towards Sustainability	Fielding, McDonald & Louis, 2008	3	Average score of 1-5 of 4 subquestions
Perceived Norms	Fielding, McDonald & Louis, 2008	6,7	Average score of 1-5 of two questions
Perceived Behavioural Control	Fielding, McDonald & Louis, 2008	8-10	Average score of 1-5 of three questions
Personal Connections	Tindall, Davies & Mauboules, 2003	18	Score of 1-5
Professional Connections	Tindall, Davies & Mauboules, 2003	19	Score of 1-5
Identity	Fielding, McDonald & Louis, 2008	13,14	Average score of 1-5 of two questions
Formal Leadership Experience	Eike 2014	24	Score of 0-15 Founder worth 5 President worth 4 Vice President worth 3 Elected position worth 2 Representative worth 1
Perceived Program Efficacy	Fielding, McDonald & Louis, 2008	4	Average score of 1-5 of 4 subquestions
Perceived Community Efficacy	Fielding, McDonald & Louis, 2008	5	Average score of 1-5 of 4 subquestions
Intentions to engage in SL	Fielding, McDonald & Louis, 2008	11,12	Average score of 1-5 of two questions
SL*	Dono, Webb & Richardson, 2009	20-22	Average score of 1-7 of three questions. The score of question 21 was multiplied by 1.4 to match 7 point scale of other two questions.

* Used for interview selection process.

Appendix E: Interview Guide

The following questions and topics will be used as a guide for the interviews. The researcher will avoid asking leading questions and providing opinions. The topics are drawn from the research questions and the literature review. The focus of the interview will be on what makes someone engage in sustainability leadership, all other topics covered will be in relation to this.

What kind of sustainability leadership activities do participants engage in?

What do they feel allows them to engage in being sustainability leaders?

-Reasons for engagement

-Barriers to engagement

-What theories align with these reasons?

-Attitudes

-Perceived behavioural control

-Perceived Norms

-Biographical availability

-Network theory

-Collective action

How does the ESS program effect their engagement in sustainability leadership?

What has ESS taught them?

-facts, methods, skills, tools, personal qualities, other?

Do they engage more as they learn/know more, or have more competencies?

How has their engagement in sustainability leadership changed over the course of the ESS program?

Which classes helped students engage the most in sustainability leadership?

Which classes made students not engage (or stop engaging) in sustainability leadership?

How has the community of the ESS program (students and staff) affected their engagement in sustainability leadership?