

DALHOUSIE CURRICULUM AUDIT

Curriculum Audit:

How Dalhousie University is integrating sustainability into its non-environmental undergraduate programs

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Executive Summary

Interdisciplinary education is a trend in post-secondary education across the world (Bear & Skorton, 2019). Climate change, and other issues of social and environmental sustainability are increasingly relevant and pressing to future leaders. To ensure the prosperity of the planet and society it is important for students (future leaders) to receive a comprehensive education, this can be achieved through interdisciplinary education (Feng, 2012). Dalhousie University is known for its achievements in sustainability education, however, there is little research into how they have integrated sustainability into their non-environmental undergraduate programs (Wright & Defields, 2012). The purpose of this research is to begin identifying how professors are explicitly or indirectly integrating lessons about sustainability into their curriculums. For this project, there was a focus on Computer Science, English, Management, and Political Science departments. To gather information about the integration of sustainability into non-environmental programs at Dalhousie, students and professors were surveyed.

The survey results ended up being insignificant due to constraints on our capacity to distribute the surveys to the students and professors. Results are therefore extrapolations based upon the surveys that were completed and can act as a precedent for future research in this area. The results of our study were that 60% of students surveyed had taken a course with an environmental focus, and for over 70% of these students this course was not required. This seems to indicate a general interest in the study of sustainability for students not enrolled in explicitly environmental or sustainable programs. Over 70% of professors interviewed felt that sustainability education is an integral part of any education, and that students should be required to take a class on sustainability during their degree.

One of Dalhousie University's goals is to enhance values, knowledge, skills, and social norms that support sustainability. If they were to make changes in policy that required all undergraduate programs to explicitly integrate sustainability into their curriculums, this change would be supported by professors and students alike. Dalhousie currently does not require all programs to integrate sustainability into their curriculums. However, many professors feel their classes can (are relevant to shaping future leaders in a world where issues of sustainability are increasingly relevant) or do integrate sustainability education.

Introduction

Background and Rationale

The climate is changing, and regardless of one's field of study, they will encounter ethical and physical encounters of sustainability in their career. Incorporating sustainability into post-secondary education can be done in one of two ways. One is by adapting existing courses to include an element of instruction surrounding relevant questions of sustainability that may be encountered by the students in that particular program. The other is by adding entire courses that cover these topics (Aurandt & Butler, 2011). Based on our experience as Dalhousie students in interdisciplinary programs, it seems that environmental education is confined to explicitly environmental programs. Environmental education has been shown to be an incredibly necessary component to fostering environmental awareness and behavior in individuals, particularly in university students who will be employed within leading industries, areas of government, and organizations in the future (Freed, 2017; Meyer, 2015).

Environmental education will be defined as curriculums which include case studies surrounding an ecological event, sections on ethics of environmental treatment, or units about the long-term sustainability of the practice or concepts being taught in the course. Sustainability will be defined as the social and environmental viability of an action, that it will meet the needs of the present without compromising the ability of future generations to meet their own needs (Brundtland, 1987).

There is a trend in universities across the Western world towards interdisciplinary education (Bear & Skorton, 2019). Interdisciplinary education was described by Newell in his 1988 collection of essays on Interdisciplinary education as the following.

“Interdisciplinary learning experiences serve to integrate knowledge from multiple disciplines and build on the reductionist insights of specific fields of inquiry to develop a more comprehensive understanding of the larger phenomenon” (Newell, 1998).

There are proven benefits to an education which integrates a diverse approach to education such as teaching communication to doctors through poetry writing and reading or teaching engineers about metal alloys in the context of historical exploration (Bear & Skorton, 2019). Sustainability

issues are inherently complex, and solutions are uncertain (Feng, 2012). This complexity requires collaboration across disciplines and expertise to create holistic and effective solutions.

Dalhousie is a leader in sustainability education, with arguably one of the most comprehensive sustainability-oriented programs in Canada (Wright & Defields, 2012). However, this is mainly centralized within the collage of sustainability, and Dalhousie has dozens of other programs that would benefit from incorporating this topic into their curriculums. There seems to be little research into the integration of sustainability education into non-environmental programs at Dalhousie, and this seems antithetical to the inferred goal of creating well-rounded students. It is important to identify which programs have taken it upon themselves to incorporate sustainability education into their curriculum to then be able to see how they can expand or inspire similar programs to do the same. In order to understand Dalhousie's success in the field of sustainability education, it is also important to know which programs are lacking in this field. Knowing where programs are succeeding, and which are lagging will allow for future research to be done into how these gaps can be filled. The lack of literature on the current integration of sustainability education at Dalhousie is a barrier to implementing changes to make Dalhousie a more well-rounded and environmentally progressive university.

Objectives

Post-secondary education is meant to shape future leaders in a variety of fields. Our team believes that having a foundation in sustainability ethics, case studies, and general knowledge of the ecological long-term impacts of one's actions is crucial to creating strong leaders. Climate change is arguably the most pressing issue of our generation, and if it is not mitigated and reversed in the next eighty years, society and our environment will be irreversibly altered. According to the Dalhousie Office of Sustainability, one of their key goals is to enhance values, knowledge, skills, and social norms that support sustainability (Dalhousie Office of Sustainability, 2020). Our objective is to begin to understand to what extent different programs at Dalhousie are working to achieve this goal. We want to determine to what extent and in what ways sustainability education is currently integrated into non-environmental programs at Dalhousie. Since Dalhousie offers such a vast range of non-environmental classes, we decided to focus on a sample of programs that spanned faculties on the Dalhousie Studley campus. Our chosen programs include English, Computer Science, Management, and Political Science. We

will be interviewing students and professors in these faculties to form an understanding of the existing presence of sustainable education within their curriculum. We will be looking mainly at required courses in order to accurately represent what the specific programs offer in the way of sustainable education.

These programs will shape future business owners, writers, program developers, and political leaders. All these professions have an impact on the way society sees the world and how resources are used and extracted to meet the needs of society. Our objective is to identify the programs that already integrate sustainability into their curriculums, and those that do not. We aim to then make suggestions on how sustainability could be better incorporated into the programs through dedicated courses, integrated lessons, or program-specific workshops. The overall goal would be to find ways that Dalhousie could create more environmentally aware students, and to identify ways that they are already doing this. Since there is a lack of literature on Dalhousie's sustainability integration, it would be useful for us to compile research on their successes and shortcomings in this area. This leads to our research question: to what extent does Dalhousie University currently integrate sustainability and environmental education into the curriculums of traditionally non-environmentally oriented undergraduate programs?

Methods

Our study aimed to determine the implementation of environmental awareness and sustainable practices in non-environmental oriented programs. As suggested by Ajaps and McLellan (2015), there is a positive relationship between environmental knowledge and pro-environmental behavior (Ajaps and McLellan, 2015). For this reason, we sought to determine the extent to which Dalhousie prioritizes environmental education across disciplines. To complete this study, we used a mixed method approach, including both qualitative and quantitative data collection. Surveys were conducted online to determine sustainable efforts in correlation with their program of study. This was accompanied by interviews with professors across disciplines, aiming to gain an understanding on their willingness to comply to environmental instruction.

We chose to focus on four programs which are representative of the range of non-environmental programs offered at Dalhousie. These programs were Computer Science, English, Management, and Political Science. We created two surveys via Google forms, one specifically targeting professors of our chosen Dalhousie programs and the other Dalhousie students. We contacted professors of first and fourth year undergraduate classes from each of the selected disciplines by email with our professor survey, and distributed the second student-aimed survey through an organized email blast to Dalhousie students (Appendix 1). With approximately 2700 students across the four chosen programs, we aimed to survey 92 students across faculties to have a 95 percent confidence and a confidence interval of 5. Due to the current Covid-19 pandemic, challenges arose, resulting in surveying a smaller sample of students across each year of study, rather than only first and fourth year. As Dalhousie has approximately 145 faculty within the originally chosen programs (27 in computer science, 25 in English, 59 in management, and 44 in political science), we aimed to interview 10 professors to hold 95 percent confidence in our results as well as an interval of 30.

Our study used simple random sampling to determine the environmental education provided over Dalhousie Studley campus. Correlating with the student responses were interview questions, which were given to professors to gain insight on their opinions of the incorporation of environmental education in non-environmental programs of study (Appendix 2). We felt that surveys were appropriate for students as they are an efficient method in gaining information anonymously. We felt that interviews were a more personal method for professors, as they were

provided a chance to expand on their responses. Following data collection, we had a versatile plan of statistical analysis, contingent on sample size.

In terms of individual questions, we first asked students about their program and year of study, to gain insight on the demographic questioned. We then asked a series of questions regarding the nature of classes taken by the individual student. For example, we asked if the student has taken an environmentally based class, and if that was a requirement. We then asked questions about professors who may have given environmental information in classes outside of environmental science or sustainability (Appendix 1). Our original intention was to use results from the surveys to determine which professors could be questioned further. This would demonstrate that regardless of the program of study, it is possible to incorporate environmental knowledge. However, due to circumstances, professors were chosen at random throughout the original programs chosen.

A Google form was distributed to professors, and included a series of interview-style questions. These questions were based on the faculty that they teach within, and their opinions surrounding the plausibility of incorporating environmental material in their own classes and as a requirement for programs at large. To complete these questions, we used a Likert scale ranging from 'strongly disagree' to 'strongly agree'. This method ensures more reliability than a simple question of 'Yes/No', as it records the degree of respondent enthusiasm (Appendix 2). For example, when asked, "How feasible do you think the incorporation of environmental education into your program could be?" a range of responses would allow an overall estimate.

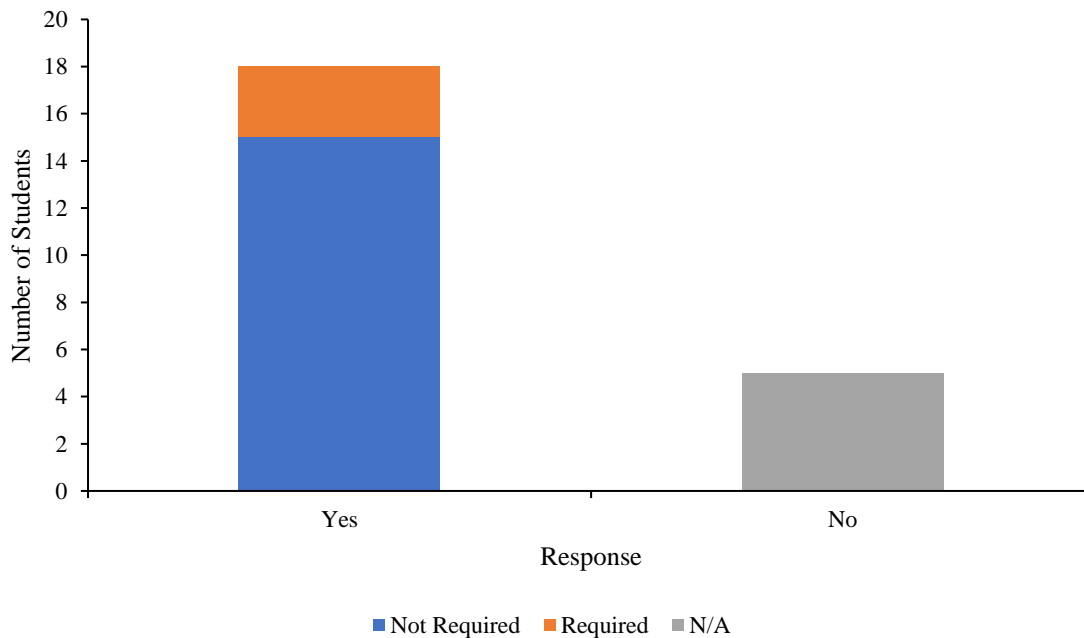
Following the interview period, data was collected to determine the probability of incorporating environmental content into non-environmental courses at Dalhousie. Upon examination, we felt that we could determine the relevance of adapting courses to include sustainability elements, or through a required sustainability course.

Results

Due to external constraints, the sample size of both students and professors was smaller than expected. Many potential insights of statistical analysis were thus nullified by the sample sizes, so the study's results were considered largely foundational to future surveying. Figure 1 displays the responses to the student survey's introductory question, regarding whether the student has taken a course with any environmental themes, and whether this was required by their program or taken as a nonrequired elective.

Figure 1.

A comparison of students who have taken a course containing any amount of environmentally significant content, against those students who have not.



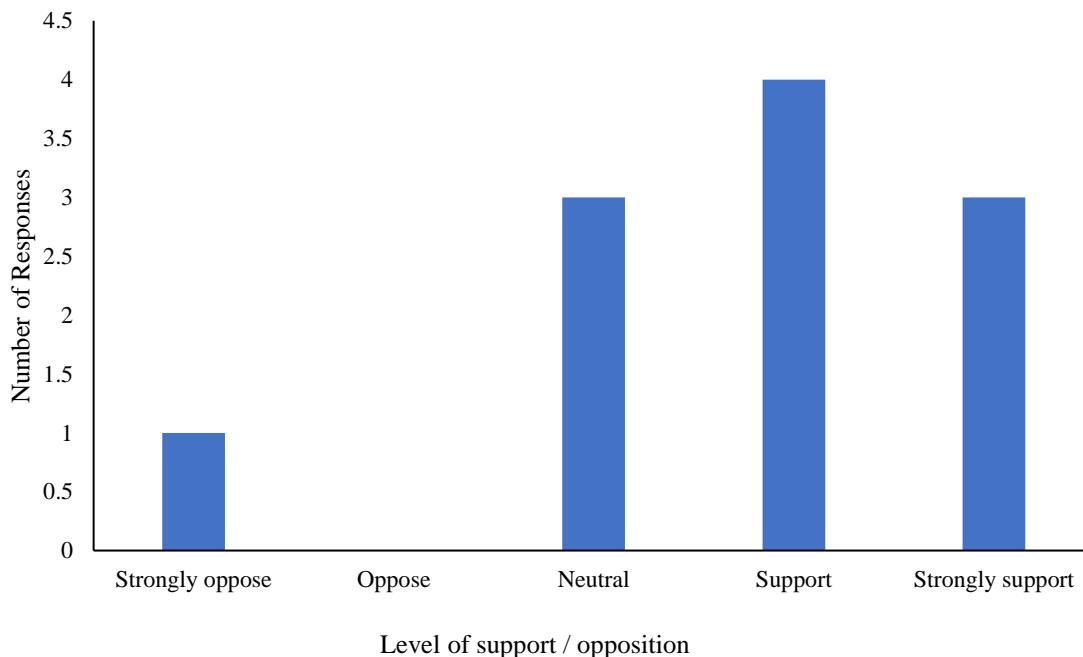
The students surveyed were equally distributed between first, second, third, and fourth year undergraduates. Eleven students were in the faculty of Arts and Social Sciences (henceforth termed 'Arts'), 11 were in the faculty of Management (henceforth termed 'MGMT'), and 2 were in the faculty of Science. The latter demographic was considered too small to be statistically significant, so was dismissed from analysis.

A Chi-square test of homogeneity (Appendix 3) was performed to compare MGMT and Arts students regarding whether they have taken a course they consider to have “incorporated an element such as environmental ethics, an environmental case study, resource management, or other sustainability teachings”. This question was indiscriminate as to the official Dalhousie listing of the course (it did not matter if the course was listed as SUST, ENVS, or any other program). Six of 11 Arts students and 10 of 10 MGMT students replied that they had taken such a course. The Chi-square test showed that this is a statistically significant difference ($p = 0.0087$; $p < 0.05$). Arts students take fewer environmental courses than MGMT students do.

The survey of professors yielded a sample size of 11. Six individuals identified as arts professors, 3 with science, and 2 with management. As previously mentioned, none of these groups were considered large enough to be statistically significant individually, so were not distinguished by faculty for analysis. The response to questions of support towards environmental education were generally positive, as seen in Figure 2, where 82% of respondents were at least ‘neutral’ to the idea of traditionally non-environmental programs incorporating environmental education.

Figure 2.

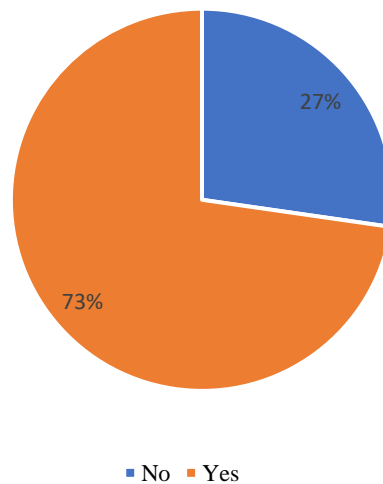
Asked on the unspecific “importance of environmental education in traditionally non-environmental fields”, most respondents were supportive.



When asked directly their opinion on required environmental education, the response was similarly positive. Figure 3 shows that 72.7% of professors sampled believe that a SUST or ENVS course should be a required elective in programs traditionally considered non-environmental.

Figure 3. Asked “Do you think traditionally non-environmental programs should have a required ENVS or SUST course”, most respondents were supportive.

Professor responses when asked if non-environmental programs should have a required ENVS/SUST course?"



Discussion

In our research, we sought to answer the following question: to what extent does Dalhousie University currently integrate sustainability and environmental education into the curriculums of traditionally non-environmentally oriented undergraduate programs? This research was conducted in the interest of gaining a useful body of knowledge as to Dalhousie's present successes and shortcomings in the area of general environmental education incorporation

across all of its under-graduate programs, not just those with a core, identified environmental focus. It was believed that an analysis of this information could provide applicable indications as to what opportunities exist for the university to better integrate environmental concepts to provide an enhanced, more well-rounded, and progressive education to its students.

Through our research, we found that of the pool of 23 undergraduate students surveyed, 60.9% of students responded that they had taken an environmentally specific course listed under either the Sustainability or Environmental Science programs at Dalhousie (Figure 1). Of these respondents, 73.9% indicated the Sustainability/Environmental Science course they took was not a required course, suggesting they took it of their own volition due to personal interest or as an elective. When students were asked if they had taken a course that was not strictly listed under the Sustainability or Environmental Science faculties that they felt incorporated an environmental or sustainability theme, 78.3% of students responded yes. A split majority of 7 students each indicated that these classes fell into the Sustainability faculty of courses, as well as the non-traditionally environmentally focused Management faculty. Further, when asked, 69.6% of students responded that they felt the courses they had taken at Dalhousie improved their knowledge of sustainability issues and 73.9% indicated that Dalhousie courses had inspired them to take action in living a more sustainable life.

These findings are significant and surprising, given that only 4 of the 23 students indicated a major of Environmental Science or Sustainability, with a majority of 11 students being enrolled in the faculty of Management. Other students indicated majors of English, Psychology, Law, and Contemporary Studies, all of which, including Management, are not traditionally oriented towards environmental studies. Given that 60.9% of these students specified they had taken an Environmental Science or Sustainability course, and 73.9% of students specified that the course they had taken was not required for their degree, this could signify that Dalhousie's execution of its environmental programs is successful in being relevant and progressive enough to attract student interest. Perhaps specifically courses within the

Sustainability program can be shown to be of greater interest to general undergraduate students than the Environmental Science program, as students responded that of the Dalhousie courses they took and felt had a component of environmental education, 7 responded that it was a course from the Sustainability program. This weighted interest towards the Sustainability program may be due to the intentionally interdisciplinary nature with which the College of Sustainability at Dalhousie was designed, drawing greater interest from students across diverse undergraduate programs (College of Sustainability, 2020). Also an interesting finding is the fact that Dalhousie's Management program appears to incorporate a significant degree of environmental education. Seven students indicated that a course they took outside of the Environmental Science and Sustainability programs they felt incorporated an environmental focus fell within the faculty of Management. Therefore, it appears non-traditionally environmental programs at Dalhousie do actually incorporate some level of environmental education, such as with Management. This education may even be significant given that a vast majority of students responded that they felt the courses they had taken at Dalhousie not only improved their sustainability knowledge but empowered them to take greater environmental action. The Management program at Dalhousie details education on all matters of business, including marketing, finance, and entrepreneurship (Faculty of Management, 2020). This faculty can be seen as highly connective to environmental issues given the recent greater consideration of the environment in industry and economics, producing a potentially high level of overlap for Management courses. This may also be the case as Management is one of the select programs that can be paired in a double major with Dalhousie's Sustainability program, indicating further relativity to environmental themes.

Overall, our findings when it comes to Dalhousie University undergraduate students suggest that students across all faculties have an interest in issues of the environment and sustainability. Our findings suggest students will even actively choose to participate in this environmental education without the need of a degree requirement. The survey results also suggest that Dalhousie students, when exposed to environmental education, feel they have a

greater level of awareness on environmental issues and are more motivated to take personal action steps to contribute to sustainable solutions. Some of these sustainable actions indicated include buying Canadian sourced commodities, reducing their consumption, reducing waste, and recycling. Beyond these, many students noted that exposure to environmental education changed their overall mindset to be more eco-conscious, shifting the way they see and interact with the world. This finding is consistent across existing research, including a study that found environmental education could be positively correlated to an increase in environmental behavior (Meyer, 2015). Further, another study found that an environmental identity in university students, often associated with those students enrolled in environmental programs, was not necessary for students to display interest in and participation in environmental behaviors (Freed, 2017). These results are congruent with the outcome of our research. Such indicators can be seen as incredibly promising for Dalhousie and its current progress on environmental education, as well as the positive impact its existing environmental courses are having on students.

Looking at the results pertaining to our survey of professors from the non-environmental Dalhousie programs of Computer Science, Management, English, and Political Science, 8 out of 11 professors indicated they felt the courses they taught were connected to sustainability issues. A vast majority of professors responded that they strongly agreed environmental education was important to better protect the environment, and that it was important for all Dalhousie students to receive an adequate environmental education. When it comes to actually integrating such environmental components into their courses, 7 professors responded that some of their courses actually drew direct connections to the environment, with 5 indicating certain modules of their courses being related to environmental issues, and one, a Political Science professor, stating two courses they teach are entirely centered on environmental topics. Six professors responded that they also incorporate some indirect environmental education into their classrooms through modelling behaviors such as encouraging the use of reusable mugs and limiting paper use in class assessments. One professor also indicated an inclusion of class discussions pertaining to

environmental themes. Further, a corresponding 80% and 63.6% of professors responded that they would be open to doing more to provide greater direct and indirect environmental education to their students.

The sum of these findings for university professors suggests that Dalhousie's non-traditionally environmentally oriented programs may already be incorporating environmental education to varying degrees. Some of the programs studied may have more of a natural environmental connectivity than others, leading to some professors indicating a high relevance of environmental education to their courses and others less or none. For instance, 4 of the 11 professors were from the Political Science department, and it was these professors that showed a higher incorporation of environmental themes into their curriculums, with even one Political Science professor reporting to teach two courses entirely centered around environmental concepts. With the growing significance of national and international environmental emergencies, Political Science can be seen as a field of study more innately tied to environmental themes, where such issues would be a highly pertinent item in any current political discussions. In fact, Political Science is one of the programs with the highest level of overlap with the Sustainability and Environmental Science programs at Dalhousie, with 5 cross-listed courses that can also be applied to each of these environmental programs as electives. The program with the most cross-listed classes of 11 is Management, where the two Management professors who responded to the survey also indicated a relevance of environmental themes to their courses (Dalhousie University, 2020, List of approved ESS electives; Dalhousie University, 2020, Academic Calendar).

Overall, most professors from these non-environmentally dedicated programs felt it was important for them and the university to do more to enhance the environmental education received by students. 72.7% of professors indicated they believed there should be a required environmentally educational elective for all Dalhousie University undergraduate students, in order to instill awareness of environmental issues and pro-environmental behaviors (Figure 3).

As touched on previously, studies have been conducted showing the importance of environmental education for shifting student ethics toward environmental ideals. One such study focused on the impact of an undergraduate environmental studies class at Dalhousie University. It was shown that by end of the eight-month course, students displayed a statistically significant increase in environmental ideals and a shift towards ecocentric values from more egocentric/homocentric ones (McMillan et. al., 2004). This supports the findings of our own research, where environmental education can be seen as highly beneficial to students and their personal and professional interactions with the environmental crisis ridden world at large. When it comes to integrating environmental topics into a non-environmentally oriented undergraduate program, another previous study has shown positive results. Two methods of reorganizing existing courses to include a greater environmental focus and implementing new elective courses with specific sustainability topics both showed success. In both cases, students expressed that the environmental education they received proved highly useful to both co-op work placements while in school and employment opportunities after graduation (Aurandt & Butler, 2011). The implications of this study are incredibly applicable to the findings of our research, highlighting just how feasible greater environmental education into non-environmentally oriented programs at Dalhousie University may be. This study also supports a notion that greater sustainable education could help to empower students for future career paths in a world where sustainability is an increasingly relevant topic.

Conclusion

It is important to note that this study was conducted during the time of the COVID-19 outbreak and corresponding quarantine conditions. Our original research methods were designed for a much larger sample group, however, the conditions at the time of the study were a hindrance to achieving our target sample sizes.

Regardless, the results of the data we collected show that Dalhousie University may already be doing a good job at incorporating environmental and sustainability education into

non-environmental program curriculums, though the extent to which this is being implemented varies greatly between programs. The programs with greater natural connectivity to environmental concepts, such as Political Science and Management, can be seen to have a greater level of environmental assimilation, while the programs with lesser natural relevance to environmental concepts, such as Computer Science and English, were found to largely lack it. Despite the gap between programs, Dalhousie students from all faculties reported interest in and commitment to receiving education in environmental concepts. Previous studies have shown success in implementing greater environmental education and even whole environmentally focused electives into conventionally non-environmentally related programs, suggesting Dalhousie could accomplish this too (Aurandt & Butler, 2011). Environmental issues exist at the foundation of much of the key political and socioeconomic issues we face both nationally and internationally. Therefore, Dalhousie University would do well to prioritize a greater incorporation of environmental themes into existing undergraduate courses.

Overall, it is believed that Dalhousie could benefit greatly from a universally required undergraduate elective in the topic of environmental studies. This required elective would ensure that students across all faculties received an adequate level of environmental education for personal and professional empowerment. The majority of Dalhousie University professors surveyed agreed a required environmental elective would be a good idea for the university, and the majority of Dalhousie students in our research have expressed an interest in environmental education regardless of the program were enrolled in. This professional and student identified attraction to enhancing environmental education at Dalhousie suggests that, despite successful current efforts, Dalhousie really could do more. The results of our study show that an augmentation of environmental education would be desired and supported. Perhaps an opportunity for future research exists in determining how a heightened level of environmental education might impact the future opportunities and successes of university students, both personally and professionally.

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Appendix 1

Student Survey Questions

1. If you are willing to participate in this survey/interview, please indicate below by ticking the box.
 - I consent to participating.
 - I do not consent to participating.
2. What Dalhousie program are you enrolled in?
3. What is your major?
4. What year of study are you currently in?
 - 1st
 - 2nd
 - 3rd
 - 4th
 - 5th +
5. During your time at Dalhousie, have you taken a course listed under SUST or ENVS?
 - Yes
 - No
6. If yes, was this course a requirement?
 - Yes
 - No
7. During your time at Dalhousie, have you taken a course which incorporated an element such as environmental ethics, an environmental case study, resource management, or any other sustainability teachings?
 - Yes
 - No
8. If yes, what was the course? Was it required and how did it incorporate topics of environmentalism or sustainability?
9. Are you aware of any events hosted by your program which were sustainability oriented? (i.e. Bring your own mug day, or a recycling workshop.)
10. If yes, what was the event?
11. Have you had any professors who have expressed a passion about environmental sustainability?
 - Yes
 - No

12. If yes, what was the course instructor's name or course name?

13. Do you feel any of your courses have improved your knowledge around sustainability issues? How so? (i.e. Made you aware of the impacts of deforestation on climate change and wildlife.)

14. If yes, how so?

15. Do you feel any of your courses have inspired you to take action in living a more sustainable life?

- Yes
- No

16. If yes, which courses and how? (i.e. Inspired you to learn more about climate change, participate in an advocacy campaign, start using a reusable mug.)

Appendix 2

Professor Interview Questions

1. Do you consent to participate in this survey?

- I consent to participating.
- I do not consent to participating.

2. What Dalhousie University program(s) do you currently teach within?

3. What specific course(s) do you currently teach at Dalhousie University?

4. Do you feel your program of focus is traditionally linked to environmental sustainability?

- Yes, directly.
- Yes, indirectly.
- No.

5. If you answered "Yes, directly" or "Yes, indirectly" to question 3, what elements do you feel connect your program of focus to environmental issues? (either directly or indirectly)

6. If you answered "No, not at all" to question 3, what specifically do you feel makes your program of focus separate from environmental issues?

7. How strongly do you feel that your program of focus at Dalhousie University has relevance to environmental issues?

Minimally

Very Strongly

1 2 3 4 5

8. How strongly do you feel that your program of focus could incorporate education on environmental issues?

Minimally

Very Strongly

1 2 3 4 5

9. How feasible do you think the incorporation of environmental education into your program could be?

Minimally Very Strongly

1 2 3 4 5

10. How important do you believe environmental education to be in order to better protect the environment and mitigate environmental crises?

Minimally Very Strongly

1 2 3 4 5

11. How strongly do you feel receiving adequate environmental education is for Dalhousie?

Minimally Very Strongly

1 2 3 4 5

12. How important do you feel it is for traditionally non-environmentally oriented programs and courses at Dalhousie to incorporate environmental education or awareness into their curriculum?

Minimally Very Strongly

1 2 3 4 5

13. Would you agree that there should be a required environmentally educational elective for undergraduate students, in order to provide them with adequate education on environmental issues and pro-environmental behaviours?

- Yes
- No

Appendix 3

Chi Squared Test

Null Hypotheses: Arts and Management students take the same number of environmental courses.

Alternate Hypothesis: Management students take more environmental courses than Arts students do.

Table 1

Actual Results

Faculty	Student has taken an environmental course	Student has not taken an environmental course	Total
Arts	6	5	11
Management	10	0	10

Total	16	5	21
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Table 2*Expected Results*

Faculty	Student has taken an environmental course	Student has not taken an environmental course	Total
Arts	8.38095	2.61905	11
Management	7.61905	2.38095	10
Total	16	5	21

Table 3*Chi Square Calculations*

Faculty	Student has taken an environmental course	Student has not taken an environmental course
Arts	0.67640577	2.16449587
Management	0.7440459	3.2879729

$$X^2 = 6.87292044$$

$$p = 0.008751$$

$p < 0.05$; the null hypothesis is false at a confidence level of 95%