

**Sustainability Education Initiatives for University Staff: A Case Study from Dalhousie
University**

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Table of Contents

Abstract:	3
Introduction:	4
Research Objectives	5
Methods:	5
Data collection: U15 universities	6
Data collection: Dalhousie staff	7
Results:	9
U15 University Analysis	9
McGill University	15
University of Manitoba	15
University of Calgary	16
University of Alberta	16
McMaster University	17
Queen’s University	17
University of Saskatchewan	18
University of Toronto	18
University of Waterloo	19
Interviews with Dalhousie Staff Analysis	19
Discussion:	27
Comparisons to other studies	30
Future directions	32
Conclusion:	33
Acknowledgments	34
References and Appendices:	34
Appendix 1.	37
Appendix 2.	38
Appendix 3.	40
Appendix 4.	41

Abstract:

Universities play a pivotal role in fostering sustainability practices through education and operation. Considerable attention has been given to integrating sustainability into curricula to engage students; however, there is a gap in understanding the influence of university staff in this movement. This study examined staff education initiatives across U15 Canadian universities, focusing on Dalhousie University as a case study. Through a comparative analysis of existing initiatives in other U15 universities and interviews with staff at Dalhousie University, this study aimed to assess the awareness, motivation and existing gaps in staff engagement with sustainability initiatives. A variety of training strategies implemented at other U15 universities were identified, including in-person workshops, online asynchronous modules, and hybrid (in-person/online) training models. Some institutions have found training focused on staff engagement and interpersonal skills to be most effective, whereas others emphasize the importance of educating staff on basic sustainability principles and providing them with resources to learn more. The interviews with Dalhousie University staff revealed that staff are interested in sustainability but feel that there is insufficient support for sustainability education and initiatives from their departments. Staff provided various suggestions for training formats and topics, many of which aligned with the training strategies implemented at other U15 schools. The results suggest that the ideal training format for Dalhousie is a hybrid model that includes both general sustainability education and specific training curated to the staffs’ departments or positions. This training strategy can be recommended to Dalhousie University and other institutions to enhance workplace sustainability. The motivation is prominent in staff engagement in sustainability training programs; thus, it is imperative for U15 universities to adopt effective initiatives to advance their campus sustainability goals.

Key words: Staff, Sustainability, Knowledge, U15, Dalhousie University, Universities, Training.

Introduction:

Universities have long been considered key players in adopting the sustainability movement due to their roles in educating future generations (Lozano et al., 2013). While the importance of environmental education and sustainability practices for students has been well established in literature, there is less research on the influences of university staff (Sammalisto et al., 2015; Bacelar-Nicolau et al., 2023). Administrative and operational staff members are both important components in the creation of sustainable university campuses (Derahim et al., 2012). Staff play a crucial role in engaging student communities in sustainable development through creating ideal learning environments and opportunities. They have the technical expertise and accessible information to successfully implement sustainability changes on campus (Sammalisto et al., 2015; Brinkhurst et al., 2011). Thus, educating staff on sustainability is key in fostering connectedness of the environment, social and economic systems on university campuses (UNESCO, 2018). To promote sustainable change, staff should be environmentally literate, meaning they are knowledgeable and skilled in addressing and preventing environmental problems (McBride et al., 2013).

Past studies have found that staff perceptions and attitudes surrounding sustainability and environmental education vary across institutions. Some faculty and staff see their contributions to campus sustainability as less important than other factors, while others, particularly the academic staff, recognize their significant role in the implementation of campus sustainability (Yuan et al., 2013; Barth and Rieckmann, 2012). In some cases, staff are interested and willing to engage in sustainability initiatives but feel they are held back by their limited knowledge of sustainability (Derahim et al., 2012; Bellou et al., 2017). Education and training have been shown to be effective in improving staff's environmental literacy and their understanding of how they can contribute to sustainable change at their institutions and in their personal lives (Bacelar-Nicolau et al., 2023). As environmental awareness is increasing, universities across Canada are implementing sustainability education initiatives for their staff members.

Dalhousie University's Office of Sustainability is responsible for environmental initiatives within the campus community. They conduct annual surveys across different faculties

for information on environmental courses offered at Dalhousie for information towards their Sustainability Tracking, Assessment & Rating System (STARS) report. However, there are no current sustainability initiatives offered to staff members and how they relate to their work. Dalhousie is a part of Canada's U15, described as a group of 15 research-intensive universities in Canada (*About Us - U15 Group of Canadian Research Universities*, 2022). The Canadian U15 universities represent the top research institutions in the country, who are meant to lead the way in education, innovation, and sustainability (Macedo, 2023). In this study, we aim to analyze how the other U15 universities besides Dalhousie have or aim to implement educational initiatives for campus staff. Additionally, we will gain information through interviews with Dalhousie staff and evaluate their level of awareness and motivation on present and future sustainability initiatives. Thus, drawing the conclusions of favored approaches to further adopting environmental sustainability practices among staff at Dalhousie University.

This research was done largely together with the Office of Sustainability at Dalhousie University. The end goal of our research project was to supply the Office of Sustainability with enough information about other U15 universities' initiatives to train their staff in sustainability, and the level of current knowledge held by Dalhousie staff on the matter as well as their level of motivation to learn and apply this subject.

Research Objectives

1. Investigate the adoption of targeted sustainability education initiatives for university staff members at U15 Universities across Canada.
2. Assess the current level of awareness and motivation among Dalhousie university staff members.

Methods:

Our project's goals were aimed at two independent objectives that could both deliver effective recommendations. First of these objectives was to conduct a landscape analysis of U15 Canadian universities. The universities whom make up this group are; University of Alberta, University of British Columbia, University of Calgary, Université Laval, University of

Manitoba, McGill University, McMaster University, Université de Montréal, University of Ottawa, Queens University, University of Saskatchewan, University of Toronto, University of Waterloo, and Western University, with the exclusion of Dalhousie University (U15 Group of Canadian Research Universities, 2023). The goal of this was to assess the current initiatives provided by the respective universities that offer sustainability education and environmentally conscious training for their staff members. These could include workshops, training sessions, or simply awareness campaigns. This portion of the research was done in the form of literature reviews of the information acquired by each university's website, as well as reaching out to and communicating with the offices of sustainability at each university in efforts to gain more information through first-hand knowledge. Our research was approved by the Department of Earth and Environmental Sciences Ethics Committee.

Data collection: U15 universities

The data collection process of the U15 universities began by reviewing their websites and gathering supplemental information from literature. This process was conducted by analyzing each university's sustainability office website if they existed. This aimed to gather information such as the university's sustainability goals and strategies, whether they had staff training, level of engagement, and which departments were involved. To fill any gaps in knowledge and to further investigate sustainability at the various institutions, the universities were contacted via email. Initially, an email template was created (Appendix 1), which was then tailored to each individual university with background research and the specific data requested, which was not identified through other resources. Contact with the universities began on March 15th via email, and responses were collected up until March 26th. Nine of the fourteen universities contacted responded, and two of them requested to meet virtually to discuss their programs. The aim of contacting these universities was to get confirmatory information about the training and any additional details the representatives were willing to offer. Responses that indicated 'no staff training was available' were just as helpful in our research. Categories such as responses, format, focus of training, and initiatives were concluded as the variables with which to compare the universities. To determine if an institution could be categorized as having sustainability staff training, it was concluded that they must have staff training currently, previously had one, or in

the process of creating one. Additionally, they must have a formal course, workshop, or teachable component. This could be a course, a workshop series, or certification involving either, run internally by the university. Furthermore, format was categorized as online delivery or in-person, and hybrid meaning a blend of both. The focus section included information about specific strategies or values the institutions had laid out in sustainability. Lastly, the other initiatives column included other sustainability related activities or training that the university carries out.

Data collection: Dalhousie staff

The second part of the study was to conduct interviews with staff from Dalhousie University, primarily on the Studley Campus. The goal from these interviews were to gain a better understanding of sustainability initiatives and staff awareness and motivation behaviors by conducting an internal assessment of the types of sustainability training and initiatives that have (or have not) been implemented by Dalhousie University for campus staff. Whether this was training for their day-to-day life, or simple things they can do to reduce their carbon footprint while at work. It is also important to note that all the participants' names remained confidential. The reason for this was that there were questions asking for information that could reflect poorly on their respective departments.

Firstly, we drafted an email and forwarded it to Dalhousie's Office of Sustainability. The email highlighted a general description and importance of our project and provided a link for scheduling meeting times (Appendix 2). We constructed a 13-question interview (Appendix 3) that accomplished 3 main goals. First was to help us build an understanding of who is participating in our study (Appendix 3, Q1-Q3). The next goal was to assess the level of sustainability education offered at Dalhousie university. Our project was designed under the impression that Dalhousie had not supplied any type of staff education for sustainability (A. Goodman, Personal communication), so the questions explored whether staff had taken their own initiatives to obtain sustainability education (Appendix 3, Q4-Q7). The final section of questions was aimed at assessing how the participants felt about sustainability training and the levels of interest they may have in attending these workshops to further their education on sustainability. Questions explored levels of interest, motivation to contribute to these initiatives, whether the

respondents feel like the university has adequately supported sustainability initiatives, and areas respondents would be interested in learning about (Appendix 3, Q8-Q13). Our minimum significant sample size was 366 for the Dalhousie staff population of 7500 (A. Goodman, Personal Communication, February 15th, 2024). Each interview was recorded and transcribed to limit any information/quotes missed, however, documentation and data recording remained anonymous with no names affiliated with responses.

Single answer interview responses were analyzed quantitatively through calculating the frequencies of different responses (i.e., yes or no answers) as percentages. Alternatively, for rating questions, all responses (given as a percentage or on a scale from 1 to 10) were converted to a 1-10 scale and analyzed by taking the averages of the scores. The quantitative data were collected in Microsoft Excel and represented in histograms and a pie chart. To analyze the open-ended responses received for the three final interview questions, a posteriori codes and the coding tree method were used. A posteriori codes were derived from the verbal (and one written) responses by selecting 'bits' of text (i.e., words/phrases/quotes) from participants which were then grouped into two broad themes and further broken down into more specific sub themes tailored to the different answers (Franklin, 2024). A posteriori codes were summarized and organized through labels, using key words among the participants responses, to identify themes and differentiating between them for improved information classification (Franklin, 2024). Connections between related codes (i.e., themes mentioned together in participants' responses) were represented by arrows in the coding trees. Larger text boxes were used to illustrate the most popular answers, with smaller text boxes used to depict other answers.

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Results:

U15 University Analysis

To address our first objective of investigating sustainability staff training offered at other U15 universities, we contacted fourteen universities to obtain training information and searched the universities' websites (Table 1).

Table 1. U15 University Staff Training Summary Table. This table summarizes the U15 universities sustainability staff training. Response, training, format, focus, and other initiatives were used to categorize results. Email communications as well as research from university websites was used to formulate the table. Abbreviations: Sustainable Development Goals (SDGs); Equity, Diversity and Inclusion (EDI).

University	Response	Training	Format	Focus/About	Other initiatives	Source(s)
McMaster University	No	No	N/A	N/A	Office supply reuse program, Sustainable procurement program	McMaster University. (n.d.). <i>Office of Sustainability</i> . https://facilities.mcmaster.ca/sustainability/
Queen's University	Yes	No	N/A	N/A	Green office certification program, sustainable procurement guide, sustainable living series	(L. Osborne, personal communication, March 15 th , 2024) Queen's University. (n.d.). <i>Sustainable Queen's</i> . https://www.queensu.ca/sustainable/
University of Saskatchewan	Yes	Yes	Hybrid	“Work Green” program – a voluntary sustainability workplace program with focusing on engagement	Sustainability revolving fund, sustainable purchasing guide	(M. Wolsfeld, personal communication, March 22 nd , 2024) University of Saskatchewan. (n.d.) <i>Office of Sustainability</i> . https://sustainability.usask.ca/
University of Toronto	Yes	Yes	In-person	Lunch break workshop on	Sustainable change program (sustainable	(K. Bard, personal communication, March 19 th , 2024)

				SDGs and EDI focusing on how to advance sustainability in the workplace	guides and certifications), Green revolving fund	University of Toronto. (n.d.) <i>Sustainability</i> . https://sustainability.utoronto.ca/
Western University	Yes	No	N/A	N/A	Sustainable workplace ambassador's program, Staff sustainability guide, Sustainable impact fund	(L. Mantz, personal communication, March 19 th , 2024) University of Western Ontario. (n.d.). <i>Western Sustainability</i> . https://sustainability.uwo.ca/get_involved/sustainability_guide_for_the_western_community.html
University of Waterloo	Yes	Yes	In-person	Sustainability Certificate program with the goal of embedding sustainability into campus culture	Green office program, lunch and learn series	(A. Bale, personal communication, March 20 th , 2024) University of Waterloo. (n.d.). <i>Sustainability Home</i> . https://uwaterloo.ca/sustainability/
University of Ottawa	No	No	N/A	N/A	N/A	

University of Alberta	Yes	Yes	Unknown	Learning sustainability at work course aimed at creating change agents for sustainability	Affiliate network, sustainability council and working groups,	(J. Farahbakhsh, personal communication, March 22 nd , 2024) University of Alberta. (n.d.). <i>Sustainability Council</i> . https://www.ualberta.ca/sustainability/index.html
University of Calgary	Yes	No	N/A	N/A	Campus as a living lab, sustainability leadership innovation program, mobilizing Alberta initiative, Preparing Albertans for climate change e-course	(T. Milnes, personal communication, March 25 th , 2024) University of Calgary. (n.d.). <i>Sustainability</i> . https://www.ucalgary.ca/sustainability
University of Manitoba	Yes	Yes	Online	Green Office Checklist & introductory sustainability module → both aimed to increase	Green Office representatives, Green event certification, sustainability ambassadors	(J. Klassen, personal communication, March 21 st , 2024) University of Manitoba. (n.d.). <i>Sustainability</i> . https://umanitoba.ca/sustainability/

				sustainability engagement		
McGill University	Yes	Yes	Hybrid	Extensive sustainable workplace certification program	Sustainable events and lab certifications, sustainability/climate workshops, sustainable workplace ambassadors	(P. Garber, personal communication, March 26 th , 2024). McGill. (n.d.). <i>Sustainability</i> . https://www.mcgill.ca/sustainability/
Universite de Laval	No	No	N/A	N/A	N/A	
Universite de Montreal	No	No	N/A	N/A	N/A	
University of British Columbia	No	No	N/A	N/A	Sustainability education fellows program, climate and well-being education grants, Climate teaching connector,	The University of British Columbia. (n.d). <i>UBC Sustainability</i> . https://sustain.ubc.ca/

					Campus as a living lab, Brand toolkit	
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Out of the fourteen universities we contacted, only nine responded to our efforts to contact them. Through contact with the universities and other supplemental research on their websites, we were only able to categorize six of the fourteen universities as having a form of staff sustainability training (Table 1). Despite less than half of the U15 universities having staff sustainability training, it was found that eleven of the fourteen universities had other various kinds of sustainability initiatives for staff engagement (Table 1). Out of the six universities found to have staff sustainability training, workplace certifications and office checklists were common and key components. Half of the universities with staff training were either online or hybrid delivery models. It is important to note that contact with universities varied in depth and detail, but the information compared and accuracy of it was consistent.

McGill University

The most extensive staff training program offered at McGill University is part of the Sustainable Workplace Certification Program, founded in 2017 (McGill, n.d). This program has seen over a thousand staff certified and roughly one hundred offices certified since its inception (P. Garber, personal communication, March 26th, 2024). It is an engagement initiative with a checklist format, but also has a more particular training aspect as it requires a sustainability ambassador. To become a sustainability ambassador a one-hour training session is required, which has been remote since the pandemic. This program has seen a large increase in engagement, causing the program to expand immensely over recent years (P. Garber, personal communication, March 26th, 2024). It has infiltrated higher management at the university, but also has reached smaller offices as IT and HR departments. On top of their staff training program, they also have regular sustainability workshops, sustainable lab certifications, and sustainable events certifications (Table 1).

University of Manitoba

The University of Manitoba (UofM) has two staff training initiatives. Like McGill, UofM promotes a Green Office checklist as a key initiative. This program acts as a guide for departments and offices to incorporate sustainable or ‘green’ practices in day-to-day

operations while contributing to UofM’s sustainability goals. It includes a checklist that once completed, members are encouraged to implement initiatives that they are interest in. The Green Office program includes 37 members which represent 30 departments and units across the 2 main campuses (J. Klassen, personal communication, March 21st, 2024). In addition to this program, there is also a voluntary online introduction to sustainability course offered to staff.

University of Calgary

The University of Calgary does not currently have formal staff sustainability training in place but acknowledged that there is room for growth in the area. Despite this, the university offers a short sustainability onboarding video for staff that they can take when they enter positions (Table 1). The university also recently created a free online course called “Preparing Albertans for Climate Change” that can be taken by anyone (Table 1). After reviewing their website, it is clear they prioritize sustainability through their sustainability office that is divided into three teams: engagement and partnerships, energy performance and innovation, communications and reporting. They strive to connect students, staff, and faculty through learning opportunities to advance sustainability on campus.

University of Alberta

The University of Alberta has a staff sustainability training program. Firstly, the institution hosts a program called the “Affiliate Network” which was started to support the university’s interdisciplinary community of academics who are incorporating sustainability into their teaching and research (J. Farahbakhsh, personal communication, March 22nd, 2024). These affiliates can attend events related to sustainability in Academia. Additionally, the SDG office previously offered a continuing education course called Leading Sustainability at Work (LSAW) that focused on educating faculty and staff at being change agents for sustainability (J. Farahbakhsh, personal communication, March 22nd, 2024). This course was only offered over 2-3 years and is no longer offered.

Western University

Western University (Western) does not offer a formal staff sustainability training program but is currently looking at developing one. While there is no staff training, Western values sustainability on campus and has other initiatives to support sustainable practices. The institution promotes a detailed sustainability guide that is offered to staff and students. Also, there is a Sustainable Workplace Ambassador's Program created from a former green office program (Table 1). This program hosts various initiatives such as lunch and learns, green campus tours, and more.

McMaster University

No sustainability representatives from McMaster University responded to our email, and according to the McMaster website, they appear to not have sustainability training for staff. Their website did feature some information regarding their sustainability initiatives, including an Office Supply Reuse Program and Sustainable Procurement Program that staff can participate in, in addition to a variety of campus-wide sustainability events and initiatives (McMaster, n.d.). In addition, staff may choose to enroll in a sustainability certificate through McMaster's online Continuing Education Program and can finance their sustainability courses through the Tuition Assistance Program.

Queen's University

Queen's does not currently have staff sustainability training for staff, but their sustainability office did host sustainability training prior to the COVID-19 pandemic. This training was focused primarily on developing a sustainable campus at the operational/facilities level. From the pandemic until 2023, they ran a Sustainable Living Series, a series of online presentations on various sustainability topics (L. Osborne, personal communication, March 15th, 2024). Queen's is now planning to develop a new program, and offers other sustainability initiatives for staff, such as their Green Office Certification Program, Sustainable Procurement Guide, and a community garden (L. Osborne, personal communication, March 15th, 2024).

University of Saskatchewan

University of Saskatchewan (USask) previously had a program called Work Green, which was a voluntary program that recruited staff to become workplace sustainability champions, which would assess their own sustainability and that of their workplace using checklists, and then receive a certification (member, bronze, silver, or gold) according to their completed checklists (Table 1). Following a gradual decline in interest in the program, USask is now working to revitalize Work Green, with a new emphasis on sustainability education (M. Wolsfeld, personal communication, March 22nd, 2024). The new proposed Work Green program model includes an upfront asynchronous (1-2 hours online) course on sustainability, followed by a series of in-person workshops. The new Work Green program is still in development, but several initiatives are still offered to USask staff, such as a Sustainable Purchasing Guide and a Sustainable Revolving Fund for funding new sustainability projects (M. Wolsfeld, Personal communication, March 22nd, 2024).

University of Toronto

The University of Toronto (UofT) does not currently offer sustainability training to staff but is currently in the process of developing a training workshop called “Integrating Sustainability Goals in our Work Environments.” This one-hour, lunch break workshop aims to educate staff on the United Nations Sustainable Development Goals and the connection between sustainability and equity, diversity, and inclusion, as well as how staff can advance sustainability in their workplace and on campus (K. Bard, personal communication, March 19th, 2024). The workshop will be offered regularly, and new staff will be encouraged to participate. Additionally, UofT has a Sustainable Change Program, through which sustainability guides are provided to staff, students, and faculty, and workplaces can be certified as sustainable (Table 1).

University of Waterloo

The University of Waterloo currently has an active formal sustainability training program for staff. Through Waterloo's Sustainability Certificate Program, departments can opt to participate in two workshop sessions focused on sustainable action within the department (Table 1). One or two workshops are run per term, and so far, 10 departments have been recruited by the Waterloo Green Office Program and have completed the workshop series (A. Bale, personal communication, March 20th, 2024). In addition, there are other workshops and events offered to staff, such as Lunch & Learn series on topics such as energy conservation, biodiversity, and more (See Table 1). The Sustainability Certificate Program was previously a 7-part workshop series that staff could participate in individually, but Waterloo has found a departmental model to be more effective (A. Bale, personal communication, March 20th, 2024).

Interviews with Dalhousie Staff Analysis

There were seven interview respondents, six online (Microsoft Teams) interviews and one via email. The respondents each pursued a different role as a staff member at Dalhousie University and each have been employed by the university for different durations of time spanning from one to nine years of service. Out of the seven interviews conducted, the roles at Dalhousie University included; administrative secretary for technicians, program secretary at the school of occupational therapy (OT), president at the Dalhousie Student Union (DSU), director of wellness and engagement for Dalhousie Food Services, graduate and administrative secretary in the department of oceanography, and two research technicians, i.e., 43% of participants were secretaries, 29% were research technicians, and 29% were directors of programs.

Four of the seven interview participants (57%) were aware of sustainability initiatives or practices at Dalhousie University (Figure 1). Some initiatives that participants were aware of were battery collection, 4-bin waste sorting, carpooling, and cafeteria

waste reduction programs. No participants had received any formal training on sustainability practices in their role at Dalhousie, and all participants were 100% interested in participating in workshops related to incorporating sustainability both in their daily lives and into their work (Figure 1). On average, participants responded that they apply environmentally conscious decision making 66% of the time while working, and that these decisions were primarily made regarding waste disposal and a limit of printing physical copies of documents for work related topics (Figure 2). Lastly, participants rated their motivation to contribute to sustainability initiatives at Dalhousie University an 8.14/10 on average (Figure 3).

According to our coding tree analysis for the preferred delivery format for training, (Figure 4), online and in-person methods were equally favored among participants (50/50). Looking further into the two themes, it was concluded that for online, approximately 43% preferred asynchronous methods (e.g., videos/modules, handouts to do at your own pace). Regarding in-person methods, approximately 57% preferred activity-based learning, which was slightly more favored to keep learners engaged with a similar rating to discussion-based methods. A majority (86%) of participants responded that they believe that sustainability initiatives are not adequately supported and encouraged, with 57% stating that there is no support at Dalhousie University and 29% feeling that there is no support on the East Coast (Figure 5). Less than half of participants (43%) mentioned that initiatives are starting to be supported in committees at Dalhousie University and were hesitant to state this. All participants agreed sustainability training initiatives would improve their ability to adopt sustainable behavior in the workplace with 71% of participants responding that more training would contribute to overall sustainability (Figure 6). Similarly, 29% responded that they believe that all staff would benefit from training. The final question revealed specific topics/areas related to sustainability that the participants would like to learn more about through educational initiatives at Dalhousie University. In response, 43% of participants mentioned education regarding how to reduce waste, 29% mentioned education/research on how to understand where the lack of training is within departments and roles, and the remainder

of responses (i.e., encourage engagement, economic stability topics, and focus on teaching immigrants and children about sustainability initiatives) were each specific recommendations mentioned by singular participants (Figure 7).

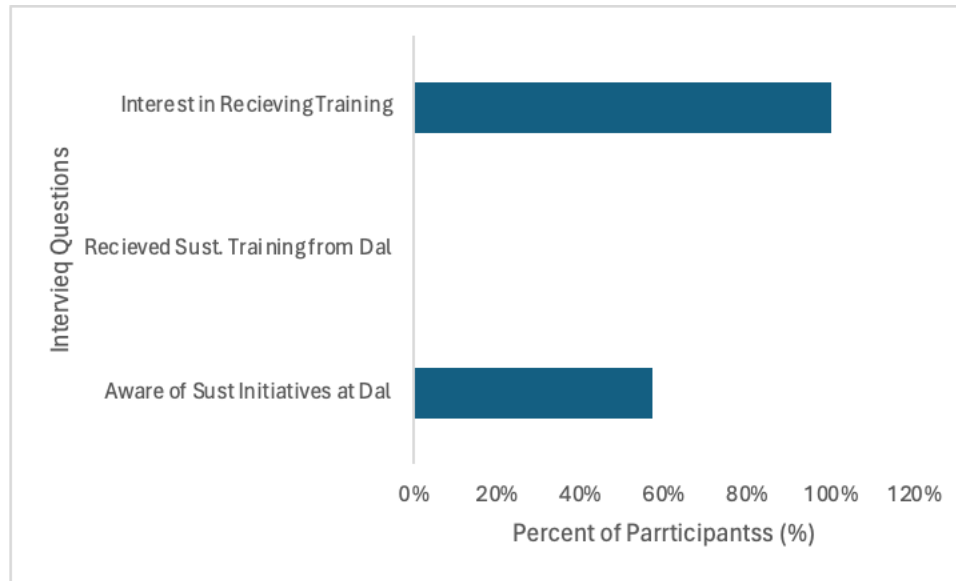


Figure 1. Responses to quantitative yes/no interview questions (Appendix 3, Q. 4, 6, & 8), provided as a percentage of participants (n = 7).

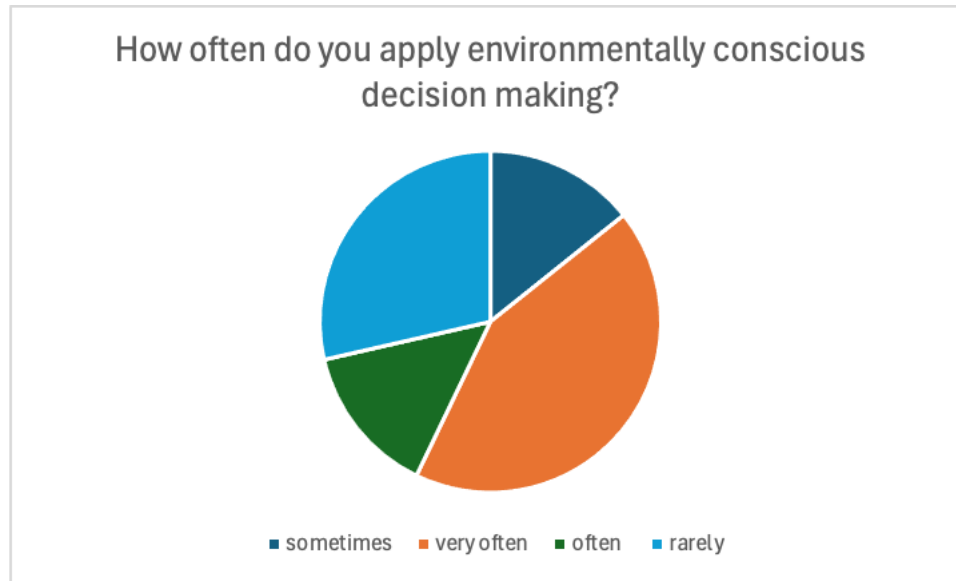


Figure 2. Pie chart representing Dalhousie University staff members' responses (n = 7) to interview question 5 (Appendix 3). Segments of the chart represent the percentage of staff that provided the corresponding answer.



Figure 3. Histogram representing Dalhousie University staff members' responses (n = 7) to interview question 10 (Appendix 3). Segments of the chart represent the level of motivation of staff that provided the corresponding answer.

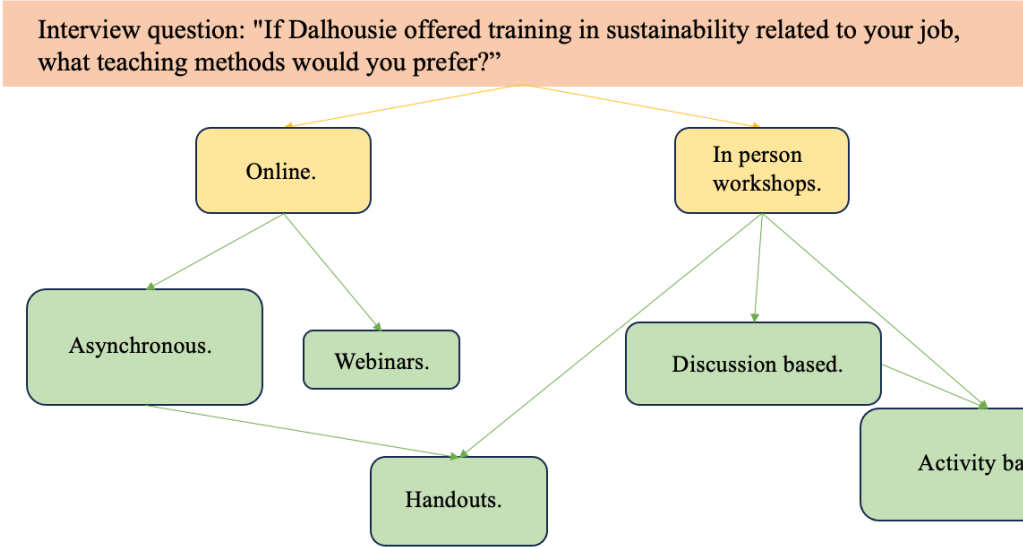


Figure 4. Coding tree analysis representing the responses of a variety of Dalhousie staff members (n = 7) from interview question 9 (Appendix 3). The orange box is interview question 9, yellow boxes indicate the broad codes extracted from the responses and the green boxes indicate the more specific codes tailored from each response. Text box size represents the relative popularity of responses.

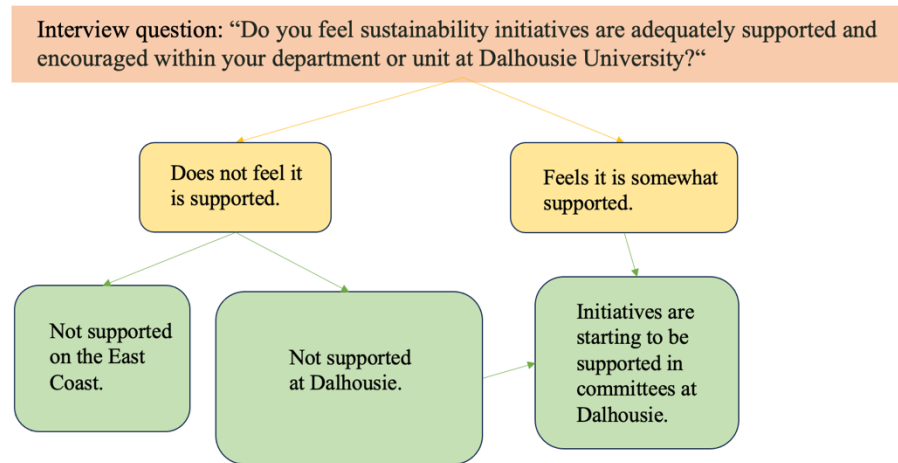


Figure 5. Coding tree analysis representing the responses of a variety of Dalhousie staff members (n = 7) from interview question 11 (Appendix 3). The orange box is interview question 11, yellow boxes indicate the broad codes extracted from the responses and the green boxes indicate the more specific codes tailored from each response. Text box size represents the relative popularity of responses.

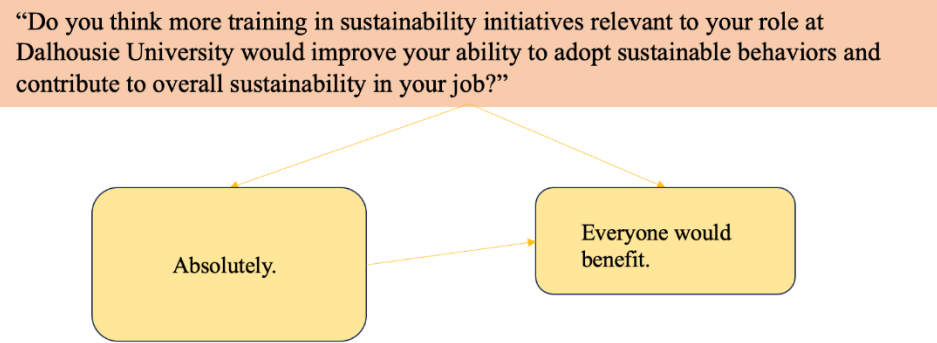


Figure 6. Coding tree analysis representing the responses of a variety of Dalhousie staff members (n = 7) from interview question 12 (Appendix 3). The orange box is interview question 12, yellow boxes indicate the broad codes extracted from the responses. Text box size represents the relative popularity of responses.

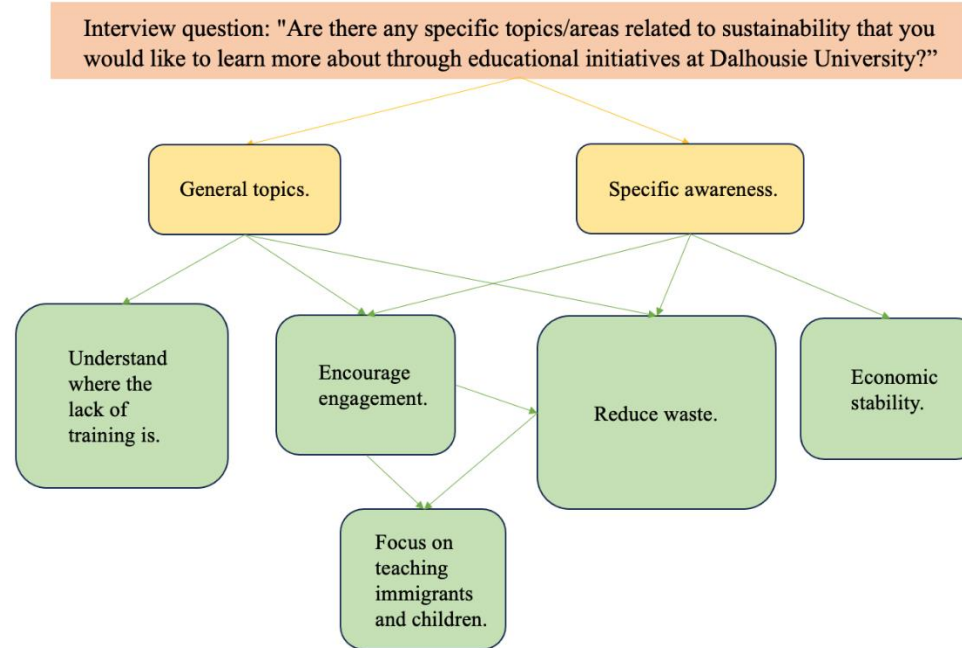


Figure 7. Coding tree analysis representing the responses of a variety of Dalhousie staff members (n = 7) from interview question 13 (Appendix 3). The orange box is interview question 13, yellow boxes indicate the broad codes extracted from the responses and the green boxes indicate the more specific codes tailored from each response. Text box size represents the relative popularity of responses.

Discussion:

Universities are key players in the sustainability movement (Lozano et al., 2013), and staff sustainability awareness is crucial for the development of a sustainable university campus (Derahim et al., 2012). As the role of university staff in campus sustainability

is increasingly recognized, institutions across the country have begun implementing specific training programs and initiatives for staff to educate them on how they can incorporate sustainability into their daily work. With this study, we identified new staff training strategies that could be recommended to Dalhousie University to improve workplace and campus sustainability. We found that other U15 universities offer staff sustainability training in various formats, including in-person workshops, online self-paced modules, or a hybrid approach combining both online and in-person training. Some training, such as the courses and workshops offered (or soon to be offered) by UofM and UofT, consists of generic sustainability education for the entire staff, while others, such as McGill's training, is more individualized and personal. Interviews with Dalhousie staff revealed that they are open to receiving more sustainability training and feel as though there is not currently enough of a focus on sustainability on campus. The staff also indicated they would prefer in-person or online training and provided suggestions for specific topics they would like to see addressed in the training.

Our analysis of the staff training provided by the U15 provided insights into what formats have led to successful, engaging training programs at other institutions. In particular, the interviews with McGill and USask were useful in allowing for discussion of why these universities have structured their current or planned training programs the way they have. McGill has had great success with their Sustainable Workplace Certification Program, which they attribute to the engagement-oriented format of their training. Rather than focusing on general sustainability education, the 1-hour training offered to McGill workplace ambassadors is focused on how to motivate peers to get involved in sustainability initiatives. Conversely, USask reported that their previous Work Green program - an action-oriented program led by sustainability champions, not unlike McGill's ambassador program - was struggling to maintain the interest of staff. This led to a complete overhaul of the USask program, with the new model placing a focus on basic sustainability education in an up-front online sustainability module. These different approaches implemented between McGill and USask indicate that the ideal training format may vary based on the target staff, and that the structure of a training program should be customized to best fit the needs and interests of staff.

Peter Garber, a McGill Office of Sustainability representative, attributed much of their workplace certification program's success to the fact that their ambassador training is very personal and engagement oriented. He mentioned that organizing training and maintaining ongoing communication with ambassadors is a significant burden on their sustainability office's staff, and that it is becoming an overwhelming issue as their certification program grows. However, he thought it was important to note that the program is worth the effort; connecting personally with the participants leads to high engagement with the program. While it may be tempting to streamline the process to make it easier for the Office of Sustainability to manage, it is important to uphold the current quality of the program (P. Garber, personal communication, March 26th, 2024). Upon adopting a similar training program at Dalhousie, considerations should be made regarding potentially hiring additional staff to manage the program.

The interviews with Dalhousie staff provided valuable information for future implementation of sustainability training initiatives. Throughout the process we found that 100% of Dalhousie staff interviewed are interested in receiving training in sustainability practices at work and at home. This highlights an interest in sustainability training among staff at Dalhousie, suggesting that upon training implementation there will be high engagement. Another critical statistic gained from the interviews was that 86% of participants did not feel that sustainability initiatives are adequately supported or encouraged by their department. The responses also discussed the importance of the entire department attending sustainability training as it is discouraging for staff when their co-workers are not attending. These findings stress the urgency of fostering a culture of sustainability within each department, and at each employee level. Indeed, a culture of sustainability spanning multiple organizational levels is known to be key for maintaining a sustainable workplace (Galpin et al., 2015). As discussed above, a departmental approach to sustainability training has already been implemented by certain U15 universities, such as McGill and the University of Waterloo, and has been successful in engaging a variety of staff at these institutions.

The interview responses also provided guidance for implementation methods and content of sustainability initiatives. Interview respondents preferred both in-person training due to the interactive and activity-centered nature of in-person workshops, and online

workshops because of their accessibility and the ability to complete them at any time. Respondents also frequently responded that they would prefer general sustainability training initially but then more specialized training once they understood the fundamentals and what they needed for their role. These preferences of the Dalhousie staff could be satisfied through the implementation of a hybrid training program such as the soon to be implemented by USask, which will feature an asynchronous online workshop on general sustainability principles followed by in-person activities. Additionally, some participants mentioned specific topics, such as economic sustainability, increasing engagement, reducing waste, waste streams at Dalhousie, and sustainability specific to science research. As mentioned in our interviews with the representatives from both USask and McGill, tailoring training offerings to staff interests is crucial for keeping them engaged. The Dalhousie staff's interview responses provide suggestions of what specific topics should be incorporated into future training.

Comparisons to other studies

Past studies on staff sustainability training provide additional support for our training recommendations for Dalhousie. Firstly, a hybrid model of synchronous and asynchronous training was suggested as an ideal delivery method for sustainability education by Perbandt et al. (2021). In their study, synchronous training was shown to be superior for improving participants' theoretical sustainability knowledge, while asynchronous training was beneficial for the improvement of communication skills (Perbrandt et al., 2021). A hybrid model was utilized in a follow-up study on university staff training and resulted in overall increased sustainability knowledge amongst the staff participants, as well as a desire to improve their sustainable behaviors in everyday life (Bacelar-Nicolau et al., 2023). Our recommendation for an in-person synchronous component is further supported by studies which have found that blended learning (in-person and online) is preferred to online-only learning (Lane et al., 2021). A blended format also helps to overcome the issues traditionally associated with online learning, such as decreased satisfaction and engagement among learners (Maki et al., 2000).

Our recommendation of having training specific to different groups of staff is also consistent with the literature on this topic. Interest in training topics is a major reason why staff may choose to participate in training in the first place (Perbrandt et al., 2021), highlighting the importance of offering training that is interesting and relevant and applicable to their job. Additionally, staff's capacity to implement sustainable workplace change depends on their specific areas of expertise. Staff have different practical knowledge based on their specific positions and general life experiences, and based on this, they may have different ideas for sustainable changes and initiatives to implement in the workplace (Süßbauer, 2019). Having specialized training for various groups of employees would allow for staff to work within their areas of expertise and reflect on what changes can be made in those areas, which may allow for the offering of novel ideas and perspectives on sustainable changes to make on campus.

Limitations

The analysis of U15 staff sustainability training was limited due to the variability in the level of detail provided by each university (both on their websites and via email) regarding their staff training programs. We could not perform a thorough comparison of the effectiveness of different training initiatives due to many of the programs having not yet been implemented, or the universities not having solid data on their programs' engagement and success. Some universities did not communicate the specific sustainability topics, nor the objectives of the training they aim to conduct. In addition, some universities simply did not respond to our emails, meaning we may have gaps in our dataset for any information that was not provided on their websites, such as any training initiatives that are currently in development at these institutions.

Regarding the staff interview process, time constraint regarding the data collection of interviews which took place over 15 days (March 11th -26th). There were limited time slots due to team member availability, this could have affected the number of individuals available to participate in the study (i.e., if they were unavailable/busy) over the designated times listed throughout the short duration of the data collection period. This limitation ultimately led to an insufficient sample size of seven participants for

statistical measurements while, the staff population at Dalhousie is 7500 (A. Goodman, personal communication, February 15th, 2024). Furthermore, the chance of receiving perceptions from diverse employment positions may have increased variety in responses, concluding a more diverse conclusion.

Additionally, a limitation of the study conducted is the course's affiliation with Dalhousie University. As the study was conducted with the institution which employs the staff and an official university office (the Office of Sustainability), this could have affected the participants' responses. Ultimately, the responses could have been curated to seem a certain way depending on their role as staff or out of potential fear of repercussions for their jobs.

Future directions

Dalhousie should directly assess the staff's sustainability knowledge within their roles on campus. Research should be conducted to provide an enhanced understanding of areas requiring further education. This assessment should consist of a wide array of departments and roles, with a large sample size to ensure significance in the results. This would add to our study's smaller sample size, of seven individuals, providing a more effective conclusion. There should be continuous measurements of success through periodic surveys and interviews, to evaluate the ongoing effectiveness of the sustainability initiatives. U15 universities should take a more cohesive approach in consolidating initiatives that have been successful on their online platforms and elaborate on their methods of approach for other universities to adopt. As sustainability initiatives become further adopted and implemented at U15 universities, future studies will compare successful initiatives and Dalhousie will adopt the ones they will benefit most from.

Conclusion:

Throughout our research, we examined staff perspectives and motivations on the current sustainability initiatives at Dalhousie and integration of sustainable practices at other U15 universities. Overall, the study revealed the current progress of training initiatives for post-secondary staff and the effectiveness of specific methods. The purpose of the internal analysis of Dalhousie staff was to assess the current levels of sustainability education amongst the staff members and how interested they would be in attending workshops to further their education. The following step would be to use the acquired data and construct position curated education programs for the staff members. Considering the results of our research, Dalhousie has not yet met the needs of its staff for this subject. However, all participants of our study indicated a high level of interest in attending sustainability workshops and other educational initiatives. Our interview results ultimately indicate there is high potential for future sustainability education initiatives to have high success levels. Following the results of our analysis of other U15 universities across Canada, it would be beneficial for Dalhousie to model future education initiatives after the universities who have had programs with high engagement and success. Specifically, McGill has created programs designed for specific staff roles and has seen high interest and engagement with their staff, in addition to USask's new online module covering fundamentals in sustainability education. Ultimately, through integrating both the knowledge we gained through the internal assessment of Dalhousie staff and the external U15 research we constructed the following recommendations for Dalhousie's future implementation strategy:

- A hybrid model that incorporates online training, as well as in-person seminars.
- To ensure high engagement, training initiatives should be department- and employment position- specific.
- Increasing the funding and current staff to run constructive sustainability training.
 - The quality of the training is crucial to have a high impact.

Acknowledgments

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Appendix 1.

Email to U15 Universities:

Subject: Sustainability staff training at [university name]

Dear [representative],

We are a group of environmental science students at Dalhousie University completing a research project in our course "Campus as a Living Lab (ENVS 3502)". Our team is working with the Office of Sustainability at Dalhousie University to investigate current sustainability education initiatives implemented at U15 Universities in Canada.

We are wondering if [university name] provides workplace sustainability training for staff members. Are you aware of any current initiatives? If so, would it be possible for us to obtain more information? We have searched [your website] and were unable to find relevant information, which is why your help would be greatly appreciated.

We will collect data until **Tuesday, March 26th, 2024**. A response from you, even if you confirm there is no sustainability training for staff members, will be helpful. We appreciate your time and look forward to hearing from you.

Kind regards,

Team of Undergraduates in the Department of Earth and Environmental Science, Dalhousie University.

[Student name]

[email address]

Appendix 2.

Email Sent to Dalhousie Staff Members:

Dear Dalhousie Departmental Supervisors, Administrators, and Staff,

Dalhousie University's Office of Sustainability (OS) is revamping its Employee Sustainability Leadership Program to better reflect staff needs.

Research is being conducted by OS with environmental science students in the Campus as a Living Lab Course (ENVS 3502) to inform the development of the program; specifically, to understand Dalhousie staff members' environmental sustainability knowledge and training needs.

Dalhousie departmental managers, administrators, and staff members are invited to participate in a 10-minute interview with the ENVS students to gain a better understanding of sustainability practices on campus through regular departmental activities and identify opportunities for further employee sustainability training.

This research has been approved by Dalhousie's Department of Earth and Environmental Sciences. Although the interview is voluntary, we appreciate all input and are looking forward to speaking with those who choose to participate!

If you are willing and able to participate, please indicate your availability in the following link to schedule the virtual interview during the week of March 11th – 26th: <https://doodle.com/meeting/participate/id/e5ADrqXe>. OR express interest by responding to this email if you prefer doing the interview via email.

If these identified time slots do not work for your schedule, please let us know as we can accommodate other meeting times if need be.

Please share with other individuals (primarily staff and department leadership) who may be well suited to participate.

If you have any questions about the project, please feel free to contact Alyssa. Note that this research has been approved by the Department of Earth and Environmental Sciences and Office of Sustainability at Dalhousie University.

Thank you for your time and consideration. We look forward to the possibility of speaking with you.

Best regards,

Alyssa, Alanna, Lauren, Max, Paige and Emma

On behalf of,

Alexa Goodman

Appendix 3.

Interview Questions:

We are a group of undergraduate students currently enrolled in ENVS3502: Campus as a Living Lab, researching the current level of environmental sustainability knowledge among staff at Dalhousie University. Through completing this interview, we hope to assess the gaps in sustainability education and determine the type of sustainability education that would be most beneficial to staff. If you have any questions throughout the session, please feel free to ask at any point.

1. What is your job title (role) as a staff member at Dalhousie University?
2. How long have you worked as a staff member at Dalhousie University?
3. What campus(es) do you predominantly work on?
4. Are you aware of any sustainability initiatives/practices within Dalhousie University?
5. How often do you apply environmentally conscious decision making while working your job?
6. Have you received any training or education on sustainability practices in your role at Dalhousie University?
7. What type of training have you received surrounding sustainability that relates to your position?
8. Would you be interested in participating in workshops related to incorporating sustainability into your daily life?
 - a. Or at your workplace?
9. If Dalhousie offered training in sustainability related to your job, what teaching methods would you prefer? Give examples:
Online videos/modules, webinars, in-person workshops, printed materials/handouts, I am not interested in receiving sustainability training, other (please specify)

10. Currently, how motivated are you to personally contribute to sustainability initiatives within Dalhousie University?
11. Do you feel sustainability initiatives are adequately supported and encouraged within your department or unit at Dalhousie University?
12. Do you think more training in sustainability initiatives relevant to your role at Dalhousie University would improve your ability to adopt sustainable behaviors and contribute to overall sustainability in your job?
13. Are there any specific topics/area related to sustainability that you would like to learn more about through educational initiatives Dalhousie University?

Appendix 4.

Staff Interview Consent Form:

CONSENT FORM

Project title: Assessing the Level of Knowledge of Environmental Sustainability Among Staff

Lead researchers: Alyssa Merriam (alyssa.merriam@dal.ca), Alanna Brooks (al389494@dal.ca), Lauren Burton (l.burton@dal.ca), Paige MacCarthy (pg731391@dal.ca), Max Wagner (mgwagner@dal.ca) Undergraduate Students, Department of Earth and Environmental Science, Dalhousie University.

Other researchers: Student supervisors; Caroline Franklin (caroline.franklin@dal.ca) and Alexa Goodman (a.goodman@dal.ca).

No funding is provided.

Introduction

This research and participation are voluntary. We invite you to take part in a research study being conducted by Alyssa Merriam, Paige MacCarthy, Max Wagner, Alanna Brooks and Lauren Burton who are students at Dalhousie University. Choosing whether to take part in this research is entirely your choice. There will be no impact on your employment if you decide not to participate in the research. The information below tells you about what is involved in the research, what you will be asked to do and about any benefit, risk, inconvenience or discomfort that you might experience. You should discuss any questions you have about this study with Paige McCarthy (pg731391@dal.ca). Please ask as many questions as you like. If you have questions later, please contact Alyssa Merriam.

Purpose and Outline of the Research Study

Universities have long been considered key players in the sustainability movement due to their roles in educating future generations (Lozano et al., 2013). While the importance of educating students on sustainability is well-established, less emphasis has been placed on the education of university staff, even though staff sustainability awareness is required to have sustainable university campuses (Sammalisto et al., 2015; Derahim et al., 2012). At Dalhousie University, there are currently no initiatives to educate campus staff on sustainability and how it relates to their work. The goal for our research project is to analyze how other U15 universities have implemented these types of educational seminars for their campus staff and to see how Dalhousie campus staff would respond to being offered the opportunity to participate in these seminars, as well as to improve our understanding of the current sustainable and environmental literacy held by Dalhousie campus staff. For the research project, the intention is to gather a variety of data from the

staff at all of Dalhousie's campuses (study population) by providing the staff with a survey that consists of about 13 questions. The responses will provide important data that, when analyzed, help shape the sustainability training and initiatives implemented. This will help develop a set of recommendations to propose to the Office of Sustainability.

Who Can Take Part in the Research Study

Inclusion: Studley Campus, Dalhousie University operations and administration staff

Exclusion: Undergraduate/graduate students, faculty

What You Will Be Asked to Do

If you choose to participate in this research, you will be asked to attend a meeting located in the Office of Sustainability. The visit will take approximately 15 minutes. During the visit you will be asked to answer 13 questions. We kindly request your consent to record the interview to better analyze the responses.

Possible Benefits, Risks and Discomforts

Risks may include potential data leaks; however, we will not have access to the participant's name so in the case of a data leak, responses are nonidentifiable. The benefits are that data collected from staff can be re-used if/when conducting further research from staff members from other university campuses.

How your information will be protected:

Your participation in this research will be known only to the Office of Sustainability and team members Alanna Brooks, Lauren Burton, Paige MacCarthy, Max Wagner, Alyssa Merriam.

Confidentiality: The information that you provide to us will be kept confidential. Only the research team at Dalhousie University will have access to this information. Our research team has an obligation to keep all research information confidential. All your identifying information (such as your name and contact information) will be securely stored separately from your research information. We will use a participant number (not your name) in our written and computer records so that the research information we have about you contains no names. During the study, all electronic records will be kept secure on the researcher's password-protected computer.

We will describe and share our findings in the final research report, and a presentation to the current (2024) Campus as a Living Lab (ENVS3502) class. We will only report group results and not individual results. This means that you will not be identified in any way in our reports. As this project is in collaboration with the Office of Sustainability, they will have access to our findings indefinitely.

Data retention: There will be no names or identifying features recorded during the collection; participants will be given a code number upon entering the interview and all interview responses will be nonidentifiable. During analysis and preparation of results the researchers will create de-identified codes to analyze the data and summarize our results. During long-term storage, researchers will keep the de-identified data for use in future studies.

With your permission, the information you provide in this research project will be kept by the researchers for other uses in the future by the research team or other researchers outside of this team. To protect your identity, we will remove or replace personal

information that could identify you such as your contact information in an effort so that anyone who might use your information cannot identify you. Even if you don't want your information to be kept for future use you can still participate in this study.

If You Decide to Stop Participating

Participants can feel free to leave the study/interview at any time they please, but once the interview, they will not be able to withdraw from participating due to the interview's anonymity.

How to Obtain Results

If participants want to review the study results, they can contact the office of sustainability or find the final report by following the provided link.

<https://www.dal.ca/faculty/science/earth-environmental-sciences/research/publications-and-theses/past-envs-3502-projects.html>

Questions

We are happy to talk with you about any questions or concerns you may have about your participation in this research study. Please contact Paige MacCarthy (pg731391@dal.ca) or Dr. Caroline Franklin (Caroline.Franklin@dal.ca) at any time with questions, comments, or concerns about the research study.

Participants may also wish to voice concern about the research to the university. Contact information for Research Ethics must be provided.

If you have any ethical concerns about your participation in this research, you may also contact Research Ethics, Dalhousie University at (902) 494-3423, or email: ethics@dal.ca

Appendix 5.

Permission or support/cooperation letter:

Dear Research Ethics Board,

The Office of Sustainability is happy to support the ENVS3502 research project investigating employee's understanding of sustainability practice and their training preferences. The OS will be cooperating with the group by providing access to resources and in-kind consultation where needed. This information will help inform future employee training programs offered by the OS.

Thank you,

Alexa Goodman, BSc, MMM, PMP, LEED GA Candidate (they/she)

Sustainability Manager, Office of Sustainability

Teaching Associate, College of Sustainability (SUST4000) & Marine Affairs Program (MARA5004)

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