

**The effects of interior green spaces on  
student wellbeing and productivity on  
Dalhousie University's Studley  
Campus**

*What are student perspectives on the amount  
of interior green space on Dalhousie  
University's Studley campus, and how do they  
affect student well-being and productivity?*

Dalhousie University

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*Emily Laage, Department of Environmental Science,  
Dalhousie University, XXXXX*

*Eva Thorpe, Department of Environment, Sustainability and  
Society, Dalhousie University, XXXXX*

*Sam Wallace, Department of Environmental Science,  
Dalhousie University, XXXXX*

*Yichen Wu, Department of Environmental Science,  
Dalhousie University, XXXXX*

*For SUST/ENVS-3502 The Campus as a Living  
Laboratory/Environmental Problem Solving Part II  
Professor Dr. Amy Mui and T.A. Meghan Terpenning  
at Dalhousie University*

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## Executive Summary

A handful of studies have explored the importance of indoor green spaces in relation to productivity and well-being. However, few studies examine indoor green spaces' benefits on a university campus. Our group believed an influx of indoor green spaces to Dalhousie University's (Dalhousie) Studley Campus was not only what students would want to see, but would be benefited by. With constant studying, coursework, and exams occurring, indoor green spaces could have positive effects of increasing students' productivity and well-being. Our research project was to conduct a study in order to prove these benefits so reliable data could be available and shared for the implementation of more indoor green spaces on campus.

We asked the research question "what are students' perceptions of indoor green spaces on Dalhousie University's Studley Campus, and how do they influence their well-being and productivity?". To answer this question, we created a short survey through Google Forms released to the student population on Dalhousie's and University of King's College's (King's) campuses. The survey asked questions that would best help us answer the overall research question. We asked things such as how productive students feel around indoor green spaces, how do indoor green spaces affect your overall well-being, where do you notice green spaces, where would you like green spaces, and would you want more indoor green spaces on campus.

Quantitative data was analyzed using raw counts in addition to a t-test and a chi-squared test. Qualitative data was condensed into a handful of themes according to similarity and counts of the themes were then compared. Students feel more productive in the presence of indoor green spaces and an improved overall sense of well-being around indoor green spaces is statistically significant in our results. We also found students overwhelmingly agree to wanting more indoor green spaces on campus. The buildings where students already notice green spaces and where they would like to see more had most counts for the Killam Memorial Library (Killam), the Life Sciences Centre (LSC), and the Student Union Building (SUB).

We recommend Dalhousie implements more indoor green spaces on campus. Students most prefer green walls and houseplants and would like to see them in the most frequently visited buildings on campus such as the Killam, LSC, and SUB. Adding more indoor green spaces to campus will increase student productivity and well-being.

## **Introduction**

Individually, each author noticed a lack of green spaces, either indoor or outdoor, on Dalhousie's Studley campus. We noticed Dalhousie has a lot of unused outdoor space on its Studley campus, for instance the space between the Killam and the Chemistry Building. Indoors, classrooms and study spaces tend to lack plants and natural light, and the Killam is a prime example of this. Indoor green spaces are associated with improved mental health, physical health as well as well-being and are increasingly recognized as a mitigation measure to buffer the adverse health effects of urban living (Dadvand & Nieuwenhuijsen, 2019). As seen below, plants and natural light in a work or study space can positively impact those using that space. More specifically, since a lack of interior green spaces can negatively affect students' well-being and productivity, this research centers arounds students' perspectives of interior green spaces and whether students feel more green spaces are necessary on Studley Campus.

We surveyed Dalhousie and King's students on their perceptions of indoor green spaces on Dalhousie's Studley Campus to culminate evidence for why Dalhousie should invest in more green spaces on campus. 177 students were sampled to represent Dalhousie and King's.

Overall, it is critically significant for Dalhousie to add more indoor green spaces to its campus in order to become an environmentally-sustainable leader. We conclude recommend they do so as it would also increase indoor air quality, as well as to promote physical health, studying efficiency, and the mental health of all students, staff, and faculty on campus.

## **Research Question and Hypothesis**

The research question we set out to answer is: "what are students' perceptions of indoor green spaces on Dalhousie University's Studley Campus, and how do they influence their well-being and productivity?". Below we will explain why we chose this topic, our research methods, and discuss our results. We hypothesize that if there are more indoor green spaces on campus, students' productivity and well-being will increase. Based on the evidence we present, we will show how our results support our hypothesis.

## **Background**

The Oxford English Dictionary defines an exterior green space as an area purposed and maintained for recreational and aesthetic use with plants within an urban area (2019). Indoor

green spaces have no definition and therefore, for the purposes of our study, are inferred to have recreational and aesthetic uses as well as plants but indoors.

Studies have been performed on the effects of indoor green spaces on people's well-being and productivity, however, most take place in office settings (Fjeld, Veiersted, Sandvik, Riise & Levy, 1998; Bringslimark, Hartig, & Patil, 2007; Lohr, Pearson-Mims, & Goodwin, 1996; Raanaas, Evensen, Rich, Sjøstrøm, & Patil, 2011; Larsen, Adams, Deal, Byoung-Suk, & Tyler, 1998; Smith, Tucker, & Pitt, 2011; Smith, & Pitt, 2009). Not many previous studies conducted on this topic examine those effects in university settings (van den Bogerd, Dijkstra, Seidell & Maas, 2018; Doxey, Waliczek, & Zajicek, 2009), despite the similarities these settings share. These similarities allow for information pertaining to green spaces in offices or workspaces to apply to university settings and vice versa. Bringslimark et al. highlight this with their finding of plants in one's immediate view increases their productivity while simultaneously decreasing their stress levels (2007, p. 585, 586). Their findings pertain to university settings, since van den Bogerd et al., believe green spaces are essential on university campuses due to student's high levels of stress, anxiety and depression (2018, p. 3).

For most students on Dalhousie's Studley Campus final exams have begun (as of this paper's submission on 10 April) (Dalhousie University, n.d., "April 2019"), making our study timely. During the final exam period students may experience increased levels of stress and may benefit from the effects of indoor green spaces. People may take breaks while studying or working, and according to Shibata and Suzuki (2001) placing plants in areas where people take breaks is an effective method for instilling the benefits of indoor green spaces (as cited by Bringslimark et al., 2007, p. 586). Or for instance, students may choose to study in their dorm rooms or apartments, and Tennessen and Cimprich (1995) found dorm rooms with views of natural environments aid students in mental fatigue recovery, compared to students without those views (as cited by Lohr, 2010, p. 677). Also, according to Fjeld et al. (1998) people spend 80 percent or more of their time indoors (as cited by Doxey et al., 2009, p. 384). These findings along with the above highlight the need for more indoor green spaces on Dalhousie's Studley Campus.

Thus, our study provides evidence for why more interior green spaces should be implemented on Dalhousie's Studley Campus as they ultimately aid student well-being and productivity. The above paragraphs outline how our research built on and added to the already existing research on this topic, and the timeliness of our topic. How we did so is outlined below.

## **Methods**

### **Data Collection**

#### **Survey**

We chose to collect data through a Google Forms survey (see Appendix A), as it allowed for both open-ended and closed-ended questions to be asked. By using both we were able to determine people's opinions on our research topic and also deduce statistics supporting their opinions. We also learned about whether students at Dalhousie feel their university should implement more green spaces on their campus, why Dalhousie should, and what types of green spaces they want.

Participants were responsible for taking the survey on their own, which should have taken them approximately 10-15 minutes. Their responses to the questions from the Google Form were translated to a Google Spreadsheet document for further analysis, which is only accessible to the authors of this paper. The survey was reviewed by project supervisors, Dr. Amy Mui, and Meghan Terpenning.

#### ***Survey population.***

If we use Dalhousie's 2017 student population of 15,000, a confidence interval of 95 percent and a margin of error at five percent, then the sample size is 375 Dalhousie and King's students (Mui, lecture slide #11, 28 January 2019). However, we only received 177 responses, 198 short of our intended goal. This shortcoming increased our margin of error from 5% to 7.32%. There are many King's students who attend Dalhousie classes so we included King's students in our survey population.

#### ***Promotional methods and incentives.***

We hung up two different posters around Dalhousie's Studley Campus and around University of King's College (see Appendix B). The posters were strategically placed in areas most frequented, i.e. the LSC, the Killam, the SUB, the New Academic Building (King's), the

HMCS King's Wardroom (King's), The Arts and Administration Building (King's), The King's Library, and Alexandra Hall (King's). In addition to posters we created promotional slips and left them in frequented areas. However, we found the most effective promotional method was to hand the slips directly to people. We performed this method on 20 March 2019 and saw a large influx of responses. We began with 74 responses and ended the promotional period (an hour) with 151 responses.

We also used incentives to entice people into taking our survey. Our incentives were a \$25 gift card for Tim Horton's and two food boxes from the Dalhousie Student Union (DSU) Farmers' Market. We chose to include these incentives to motivate people to take our survey, and thus increase the response rate of our survey. We chose a Tim Horton's gift card since it caters to both day and on-campus students, and we also chose food boxes from the DSU Farmers' Market to help build the student community and cater to day students. The winners for all three prizes were drawn using an online random name picker (<https://commentpicker.com/random-name-picker.php>), and no email address entered has any association to this website, that is to say the website will not use their email addresses in anyway. The winners of the prizes have been notified by email and will receive their prize sometime in the near future.

### **Limitations to data collection.**

This survey was designed to maximize the experimental data during a limited period. However, there are several critical limitations to the research project. The online questionnaire may have received responses from students registered outside of Dalhousie's Studley Campus and King's' Campus. Moreover, it is hard to guarantee data reliability without face-to-face communication. We also unable to promote our survey in the DalPlex and in various residence halls on Studley Campus, due to their marketing guidelines. However, we counternavigated this delay by handing out our promotional slips in the the LSC, the Killam, and the SUB. We also had difficulty reaching our desired sample size due to these limitations, which influenced our analysis as seen below.

## **Data Analysis**

We analyzed our data in two different ways each explored below, so as to ensure each was done correctly since our survey uses a mixed methods approach (both qualitative and quantitative). Our data came from the translated Google Form in Google Sheets, where it was represented by the number of responses for each choice. That number was converted to a percentage to represent the percent contribution to the question as a whole. Data in Google Sheets was used to make graphs and charts, from which conclusions were drawn. To analyse the qualitative data, short answer responses were isolated and categorized by a recurring theme. Common responses and word-choices were clumped together to form several larger-themes groups representing the data, from which conclusions were drawn.

### **Qualitative analysis.**

Our most basic analysis of this data was a count of the frequency of responses, which we did by using the find tool within Google Sheets. Short-answer responses were categorized by similarity into a handful of themes. The number count in each theme was used to compare results between themes. These themes were then converted to word clouds and a map in order to illustrate the frequencies of the themes mentioned (see Appendix C), which were based off those counts. Some of our qualitative responses were also graphically illustrated. These illustrations are based off the percentage of the response, which was calculated by doing a count of the responses, and then dividing that count by the total number of responses. We analyzed our quantitative data this way as well, and hence it is further explored below.

### **Quantitative analysis.**

We also analyzed this data through a count of response frequency. A percentage was then calculated based on this amount and the total number of responses (177), with the exception of where people notice the green spaces (325 responses due to a multiple selection answer option) was used to create the donut charts and bar graphs featured in our Pecha Kucha (see Appendix C). To analyze the quantitative data, statistic analyses such as a chi-squared test was performed to compare the distribution of indoor green space in the different buildings at Dalhousie. Chi-squared tests are necessary for this project because it can be used to compare proportions between groups with categorical data (Palys & Atchison, 2014; p. 351).



We used a t-test to determine the significance of the results we found below regarding how productive students felt while working in spaces with and without green spaces. We decided to perform a t-test because a basic analysis showed the overwhelming majority of students feel more productive with green spaces present but wanted to statistically verify the finding. When comparing the  $P(T \leq t)$  two tail variable to the standard 0.05 significance threshold, we found the  $P(T \leq t)$  two tail variable is greater than 0.05, indicating a significant difference between the data collected on the level of productivity felt when working with and without green spaces; shown in Figure 1. We decided to run the t-test test since the graph based on raw percentages derived from the data showed a trend but its legitimacy was questionable since there were some error margins in the graph as well. Figure 2 (in Appendix C) visualizes the results, and the percentages were calculated by using the search tool in Google Sheets to find the total number of responses for each level of agreeance (1-10).

The technique we used for creating the bar chart above is also the technique we used for determining the places where students notice green spaces on campus and how often (Figures 3 and 4), if students feel more green spaces should be implemented on campus (Figure 5), and whether green spaces would improve their overall sense of well-being (Figure 6). The figures are in Appendix C.

### **Limitations to data analysis.**

There were only a few limitations to analyzing our data, but none too difficult to prevent us from completing analysis. The largest limitation was our demographic information. We collected information on demographics including year of study, degree program, and primary campus. We thought these questions would be useful in understanding if demographic information had any affect on answers. We found that we had such a wide range of all demographic information that it would be irrelevant to try and make comparisons. Instead of spending our energy on coding and testing that data, we determined it was more important to thoroughly analyze the rest of the data. Therefore, none of the demographic information in the results nor the presentation was used in our analysis. The final limitation to data analysis was the high amount of responses, making it difficult to sort through unanswered questions,

non-meaningful answers (such as jokes), and properly code all the short-answer responses. Qualitative responses took much longer to analyze, but were completed nonetheless.

## **Results**

We received 177 results over the course of roughly two weeks. The following explores the main findings from our results. We then explore the limitations encountered and implied from analysing our results. All graphs and visuals representing our results are in Appendix C.

### **Qualitative and quantitative findings**

We found overwhelming support for the implementation of more indoor green spaces on Dalhousie's Studley Campus both qualitatively and quantitatively. Based on basic percentage calculations, the t-test, and chi-squared test performed, our results clearly indicate what we hypothesized - indoor green spaces on campus would improve student well-being and productivity.

Participants agree that there should be more green spaces on campus (Figure 5). The majority (86%) of respondents said "yes" to more green spaces while 5.7% said "maybe" and 7.9% did not indicate a response. There was not a single respondent who did not believe there should be more indoor green spaces on campus. The rate at which students notice green spaces was 55.4% responding they notice green spaces "sometimes", 20.9% often, 1.1% rarely, 14.7% never, and 7.9% of participants did not respond to this question (Figure 4).

When asked where students are currently noticing indoor green spaces we found that the most common responses were the Killam (20.9%), the LSC (20%), and the Mona Campbell building (11.1%) (Figure 3). These responses showed high similarity to the question of "where would you like to see more indoor green spaces on campus?" (Figure 8). The top answers were, again, the Killam (47 ct.) and the LSC (31 ct.).

With our goal of wanting to implement more green spaces in mind, we asked participants what types of indoor green spaces they would like to see. Trees (142 ct.) were the most common answer followed by green walls (127 ct.), house plants (115 ct.), and flowers (1 ct.) respectively. We also asked students the open-ended question of why or why not they would want to see more indoor green spaces on campus. The top answers being that plants provide clean air, add to campus aesthetic, and make participants feel relaxed (Figure 7).

Finally, our most important inquiries were in regards to student well-being and productivity. We asked participants both their level of productivity with the presence of indoor green spaces and the level of productivity without the presence of indoor green spaces. Running a t-test on these results showed that, with statistical significance, students feel more productive in the presence of indoor green spaces (Figure 2). We also asked participants to rate their level of agreement with the statement “more indoor green spaces on Studley Campus would improve my overall sense of well-being.” A chi-squared test on these answers showed that there is a significant improvement in well-being with the addition of indoor green spaces. 36% of respondents indicated with a score of 10 that they “strongly agree” with the statement, while only 20% indicated a score below 7 (Figure 6).

### **Limitations encountered and implied from the results**

A limitation we encountered is the lack of responses for all questions; no question received all 177 responses. On average each question received 156.23 responses, which increased our average question error to 7.8% instead of the aforementioned overall 7.32% error. Individually questions one, three, four and seven received 164 responses, question two received 159, questions five and eleven 155, question six 149, question eight 113, questions nine and twelve 163, question ten 157, and question thirteen 161. We did not make note of the number of responses to question fourteen as it was optional and used for prize drawing only.

Another limitation is the error margin from our sample size, as explored above. Because we only received 177 responses our results may not be totally indicative of what the general population on Dalhousie’s Studley Campus want in terms of green spaces. If our results were to be further accurately generalized we would need to have a more representative sample size, which, as also explored above, would be around 375 students. Also the results in this way may be a bit biased as we did not survey the whole population on Studley Campus and thus the perspectives of staff and faculty were excluded.

Finally, the findings of this research project cannot be generalized and applied to other Dalhousie campuses. This study only involved in eight buildings on Studley Campus. The results would be more reliable and representative if more buildings on Dalhousie’s Sexton, Truro, Studley and Carleton campuses are included in this study.

## Discussion

We began with asking the question “what are students’ perceptions of indoor green spaces on Dalhousie University’s Studley Campus, and how do they influence their well-being and productivity?” The purpose of our study was to understand if a university setting would benefit from an influx of indoor green spaces. We also wanted to understand what students wanted in terms of green spaces so we could try to implement more on campus.

We concluded with statistical evidence that students want to see more green spaces around Dalhousie’s Studley campus. We also proved students feel more productive in the presence of indoor green spaces than without and feel an increased overall sense of well-being. One of the more interesting findings was students want to see more green spaces in the same buildings they already notice green spaces. These buildings, the LSC, Killam and SUB, are highly frequented and central to campus activity. We predict the questions have similar results because while green spaces may be noticed, there may also be a need for more of them. Another possible explanation is because of those buildings’ visiting frequency and centrality, our respondents were split between seeing green spaces and wanting more in those areas.

Another key finding is, students specifically want to see more green walls around campus. We received many comments about the disappointment associated with the “green” wall in the SUB and how students would like to see it thriving. Given the findings on preferred green space type, preferred green space location, and where green spaces are noticed, we can conclude students would like more green spaces in the most frequented buildings on campus. We can also conclude they would like to specifically see green walls in the Killam and the LSC since those were the locations and type with the most results. These findings reassert our hypothesis.

Our findings were in line with current research surrounding our topic. While we did not test for stress reduction, we found productivity and well-being increased much like in an office setting. Now that we know the benefits of indoor plants can be extended to a university setting, we could explore more scenarios and settings where an increase in indoor green spaces would be beneficial. Exploring those scenarios and settings could be crucial under situations where increased productivity and well-being are necessary in addition to decreased stress such as

hospital settings, where further research may be useful. The benefits of indoor plants can be further explored in order to maximize mental health and productivity.

All our findings supported the initial hypotheses we made in which we predicted students' productivity and well-being would be increase in the presence of indoor green spaces on Dalhousie's Studley Campus. However, we did not make predictions about some of our questions. For example, we did not predict where students notice green spaces or where they would like to see more, yet the results surprised us. We anticipated a slight difference between where students were noticing indoor green spaces and where they want more. Instead, we found the same buildings were the most popularly supported for both questions. This makes sense since they are the most highly visited and centrally located buildings on campus, however, it was difficult to make a correlation between why those questions would have such similar answers. We predicted it could be because of the high visitation rates, we had enough responses to be split between noticing and wanting more in those locations. We also thought it could have been because although students were noticing indoor green spaces in those areas, there are simply not enough there.

The above results are highly relevant to our study since they aid us in gauging where Dalhousie needs to improve in catering to students' well-being and productivity. If the data were to be presented to a body at Dalhousie that could implement our findings, it would be extremely useful for them since it indicates where students would like to see more green spaces and of what type, ultimately catering to what students want.

### **Conclusion**

#### **Recommendations**

Since one of our study goals was to provide evidence for the need of more indoor green spaces on campus, we wanted to use that information so we could work towards implementing more indoor green spaces on campus. We found sufficient evidence and would suggest the following recommendations. Dalhousie should consider adding more green spaces across Studley campus. Concentration of indoor green spaces should be in the most visited buildings such as the Killam, SUB, and LSC. When adding those green spaces, there should be a specific focus on green walls and house plants in order to satisfy student preferences. Overall, an addition

in indoor green spaces on campus will increase student productivity and well-being; essential for a welcoming campus environment, student mental health, and high-performing academics.

### **Other research**

While our research was able to collect important information, this area of study would benefit from further exploration. As stated in our research question, we were interested specifically in student perspectives. However, faculty, staff and community members also use buildings on campus, not just students. A follow-up research question could explore the perspectives of non-students and those results could be compared to ours. Another area that could be further looked into is the types of green spaces that could be implemented on campus. In our research we concluded green wall are the most preferred. The choices of green spaces we provided in our question were ones we thought were most feasible for Dalhousie campus. However, our questions were based on our assumptions and we did not look into the possibility of buildings needing to be retrofitted in order to accommodate those green spaces. It would be beneficial to talk to campus maintenance staff and building engineers in order to determine what it would take for indoor green space implementation.

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## Appendixes

### Appendix A: Survey

4/3/2019

Dalhousie's Indoor Green Spaces

#### Dalhousie's Indoor Green Spaces

This is a survey conducted as part of a semester-long research project for ENV5/SUST-3502 - Environmental Problem Solving II (The Campus as a Living Laboratory). Your personal information will not be shared but aggregate results will be analyzed and shared with the class and Dalhousie University's Sustainability Office, and published on Dalhousie's Environmental Science website (<https://www.dal.ca/faculty/science/environmental-science-program/research/envs-3502---past-projects.html>). Only the instructor and Teaching Assistants will see the results of this survey. None of the data collected will be used beyond the scope of the research project. Additionally, email addresses will be collected (optionally) at the end of the survey to be used in the incentive prize drawing. The collected email addresses will not be used for any other purpose than the incentive prize drawing. If you have any additional questions, please contact myself ([sm713453@dal.ca](mailto:sm713453@dal.ca)) or Dr. Amy Mui ([amy.mui@dal.ca](mailto:amy.mui@dal.ca)).

**1. What is your year of study at Dalhousie University?**

Mark only one oval.

- 1
- 2
- 3
- 4
- 5+
- Other: \_\_\_\_\_

**2. Which program are you enrolled in?**

\_\_\_\_\_

**3. On which campus are your classes located?**

Check all that apply.

- Studley
- Sexton
- Carleton
- Bible Hill (Truro)
- King's
- Other: \_\_\_\_\_

**4. How frequently do you notice indoor green spaces (plants, trees, green walls, roof gardens) on Dalhousie campuses?**

Mark only one oval.

- Often
- Sometimes
- Never *After the last question in this section, stop filling out this form.*
- Other: \_\_\_\_\_

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Dalhousie's Indoor Green Spaces

**5. Which buildings do you notice these green spaces? (select all that apply)**

*Check all that apply.*

- Mona Campbell Building
- Killam Library
- Rowe Management Building
- Life Science Centre
- McCain Building
- Wallace McCain Learning Commons
- Computer Science Building
- Schulich Law Library
- I do not notice these green spaces
- Other: \_\_\_\_\_

**6. How do these green spaces make you feel?**

\_\_\_\_\_

**7. Do you think there should be more indoor green spaces on campus?**

*Mark only one oval.*

- Yes
- No
- Maybe
- Other: \_\_\_\_\_

**8. Please explain your answer to the above.**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**9. How productive do you feel working in a common area WITH indoor green spaces?**

1 (not at all) - 10 meaning (very productive)

*Mark only one oval.*

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4/3/2019

Dalhousie's Indoor Green Spaces

10. How productive do you feel working in a common area with NO green spaces?

Mark only one oval.

1   2   3   4   5   6   7   8   9   10

(not at all)                                 (very productive)

11. Please rate your agreement with the following statement. More indoor green spaces on Studley Campus would improve my overall sense of well-being.

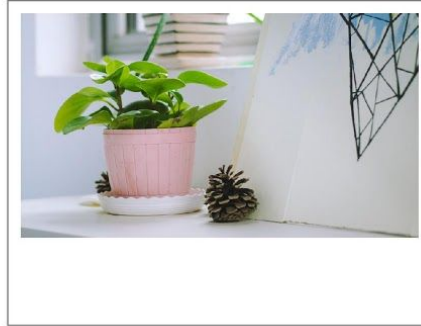
1 (strongly disagree) - 10 (strongly agree)  
Mark only one oval.

1   2   3   4   5   6   7   8   9   10

12. Which types of indoor green spaces do you want more of on campus?

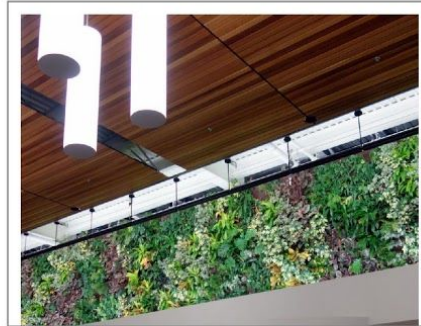
Check all that apply.



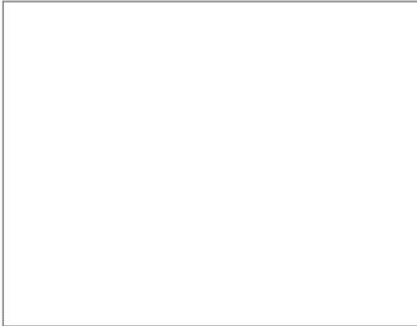
Plants (shrubs, bushes)



Trees



Green Walls  
 Other:



None

4/3/2019

Dalhousie's Indoor Green Spaces

13. Which buildings would benefit from an increase in green spaces?

---

14. If you wish to be entered into a drawing for one of our great prizes, please enter your email address below. Prizes include (1) \$25 Tim Horton's Gift card and (2) DSU Fresh Market Boxes

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 Google Forms

## Appendix B: Recruitment Materials

### Want to win a food box from the DSU's Farmer's Market? Or a giftcard for Tim Horton's?

We've got you covered! That is if you take our survey, in which you could win a giftcard for one of the above. Our survey is for ENV5/SUST-3502 (The Campus as a Living Labatory), and seeks to analyze students' perceptions of interior campus green spaces in relation with their wellbeing and productivity.



It is completely confidential and online. All you have to do answer a few quick questions by visiting this link:

<https://goo.gl/forms/9I2EjmqVwdHxtDx1>

Or by scanning this QR code:



Please note the survey is only open to Dalhousie and University of King's College students. If you have any questions or concerns please email Eva Thorpe at [ev358234@dal.ca](mailto:ev358234@dal.ca) or Amy Mui (ENV5/SUST-3502 professor) at [amy.mui@dal.ca](mailto:amy.mui@dal.ca).

Figure A. One of the posters used to promote our survey.



Figure B. The other poster we used to promote our survey.

Want to win a Tim Horton's gift-card or a food-box from the DSU Farmer's Market? Take our survey about indoor green spaces and how they relate to your wellbeing and productivity for a chance to win! You can participate by either going to <https://goo.gl/forms/912EjmqVwdHxtTDx1> or by scanning this QR code.

The survey is confidential and for ENVS/SUST-3502 (The Campus as a Living Laboratory). If you have questions or concerns please email Eva Thorpe at [ev358234@dal.ca](mailto:ev358234@dal.ca) or Amy Mui (ENV S/SUST-3502 professor) at [amy.mui@dal.ca](mailto:amy.mui@dal.ca). Thank you!!!



Figure C. The slips we handed out in person to respondents to promote our survey.

**Appendix C: Results Graphics**

t-Test: Two-Sample Assuming Unequal Variances		
	Variable 1	Variable 2
Mean	8.251533742	5.23566879
Variance	2.954858744	3.604360608
Observations	163	157
Hypothesized Mean Difference	0	
df	312	
t Stat	14.87875724	
P(T<=t) one-tail	1.63389E-38	
t Critical one-tail	1.649752124	
P(T<=t) two-tail	3.26778E-38	
t Critical two-tail	1.967596497	

Figure 1. t-Test determining the statistical differences between working with and without indoor green spaces.

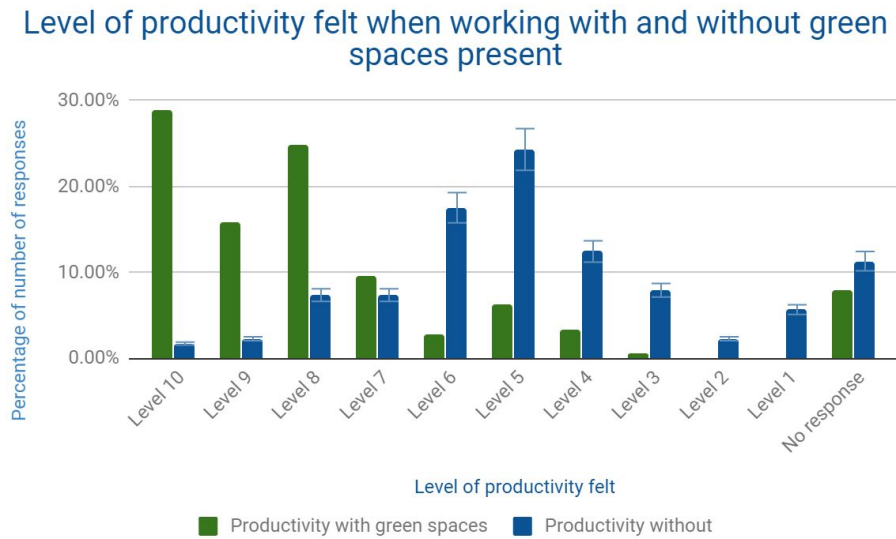


Figure 2. The levels of productivity students feel when working with or without green spaces present. 10 being the highest level, and one being the lowest.

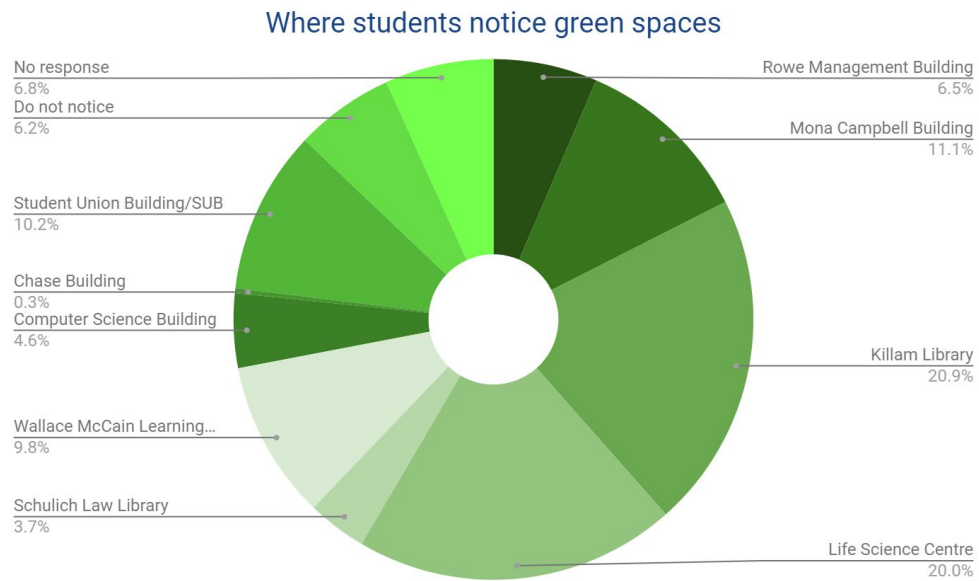


Figure 3. Pie chart depicting where students notice indoor green spaces the most on campus.

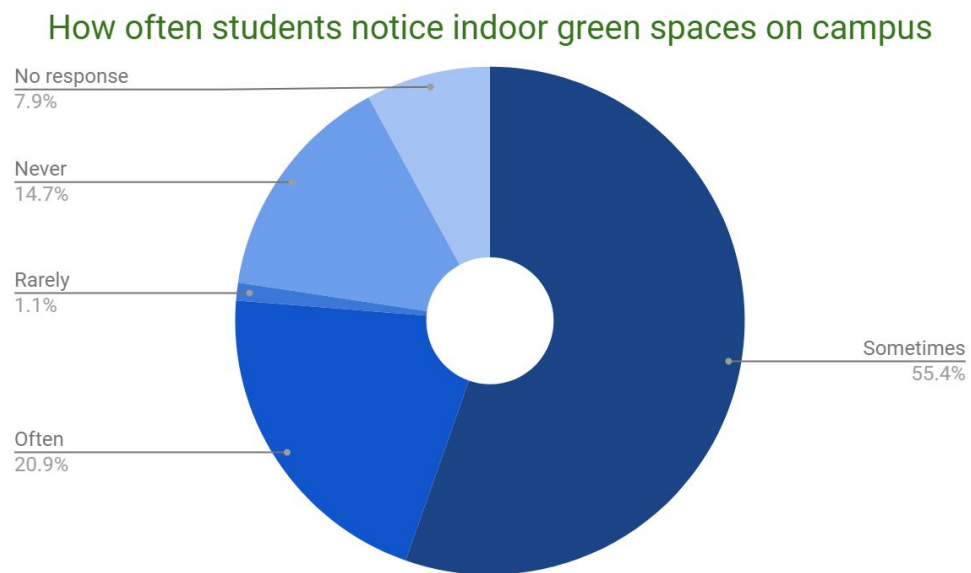


Figure 4. Pie chart depicting the percentage of how often students notice indoor green spaces on Dalhousie's Studley Campus.

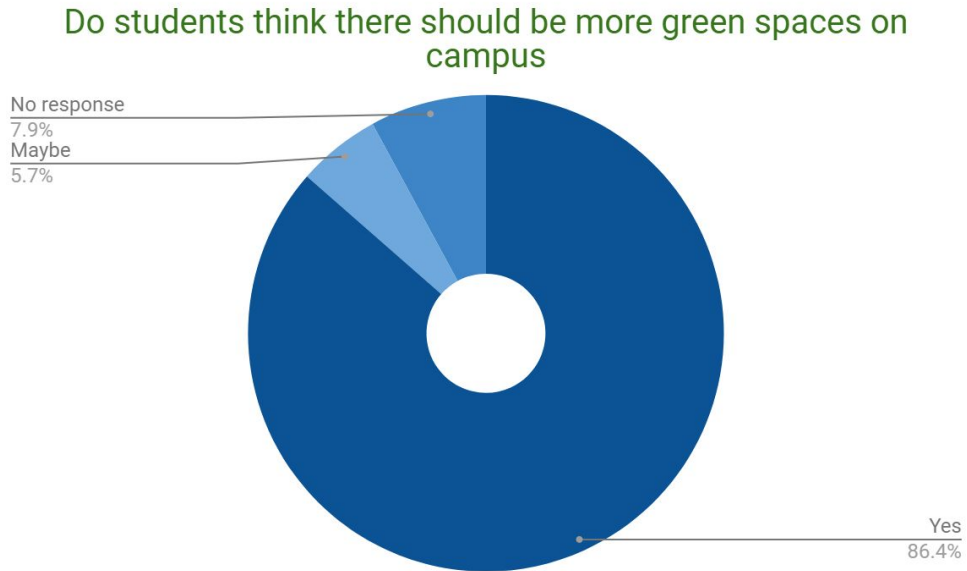


Figure 5. Pie chart showing a landslide majority of students want more indoor green spaces on campus, which reasserts our hypothesis and reframes our research question.

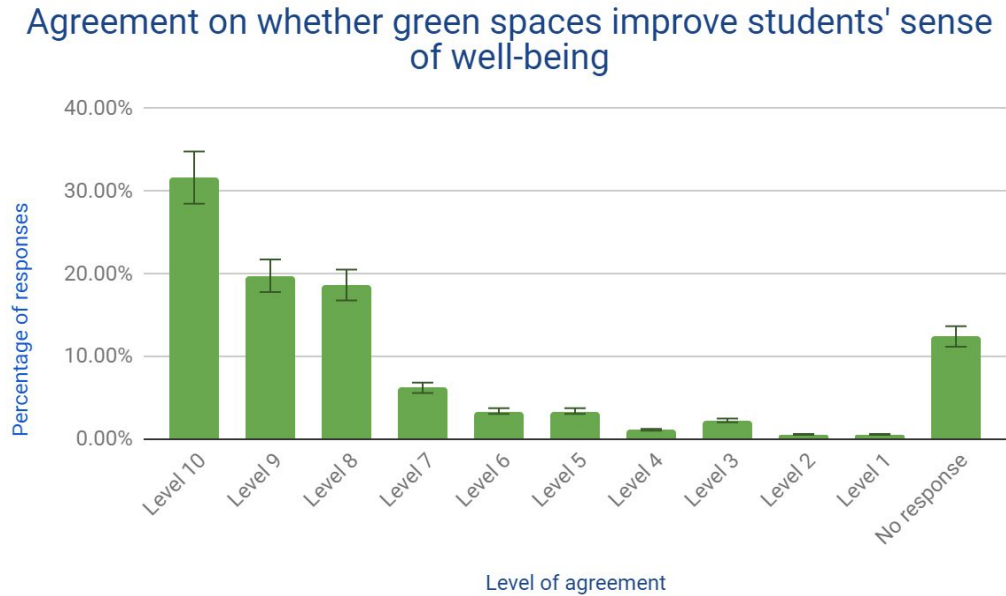


Figure 6. Students' level of agreement to whether green spaces would improve their sense of well-being. 10 being strongly agree and one strongly disagree.





Figure 7. The most common emotions students feel when interacting with green spaces.

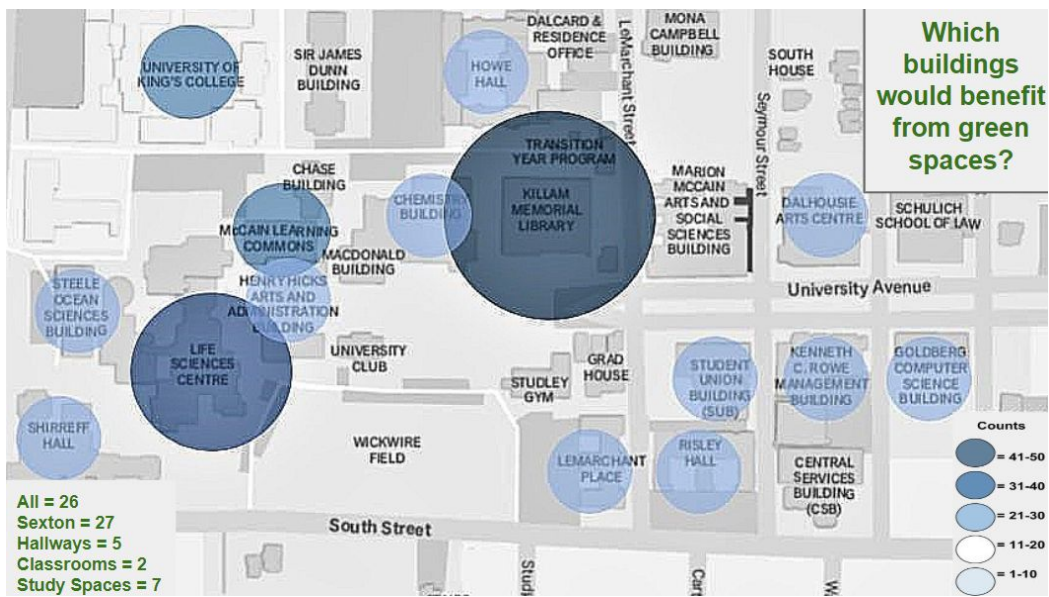


Figure 8. Map of Dalhousie's Studley Campus showing where students would like to see more indoor green spaces.

### **Acknowledgements**

We would like to thank the the Dalhousie Student Union Sustainability Office for providing us funding for our incentive prizes. We would also like to acknowledge the Dalhousie Student Union Market for allowing us to advertise their Fresh Market Boxes as an incentive. We would especially like to thank our group mentor, Meghan, for providing us thorough feedback and for always making sure we were on the right track. Finally, we would like to extend thanks to our professor Dr. Amy Mui who encouraged us throughout the whole process, provided us with the proper material and knowledge necessary to complete the study, and for making sure we all felt comfortable with where our progress was. Also, thank you to Eva who provided the awesome photo of her pink polka-dot plant, named Virginia, for the cover page!