

LEED CERTIFICATION AND STUDENT PERCEPTION

ENVS 3502

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Executive Summary

In consideration of Dalhousie's green building policy (2011), that requires LEED (Leadership in Energy and Environmental Design) certification on all newly built buildings over 10,000 square feet, this research project explores the perceived benefits and drawbacks of LEED certified buildings LeMarchant Place and the Mona Campbell building according to undergraduate students. Examining the relationship students have with LEED spaces is an integral consideration of having LEED buildings on Dalhousie's campus, as it is undergraduate students who live in, work and interact with these buildings and the way they are designed, built and operated influences students' everyday experiences at Dalhousie University. Using a short questionnaire, this exploratory study surveyed Dalhousie undergraduate students in LeMarchant Place and Mona Campbell building at different times of the day to understand if the LEED certified buildings were meeting the goals of reducing environmental impacts and creating healthy social spaces for Dalhousie students.

Results from students in the Mona Campbell building taught us that 56% of students surveyed in the Mona Campbell were aware of the concept of LEED certification, but 42% were not at all familiar with the features that were part of certifying a building. The most common year of study of students surveyed in the Mona Campbell building was second year, and students were from the faculty of arts and social sciences. Most students thought the Mona Campbell was beautiful, a fairly good place to study, good for the environment, and they generally enjoyed their time spent there. Most students used the space for appointments, social events, classes, and studying 0-2 times a week.

Similar results were found in LeMarchant Place, where the majority of students were also in their second year of study, however were mostly in the faculty of science. Furthermore, 58% of students were not aware of LEED certification or the features related to it. Similar to the Mona Campbell, most students thought the building was beautiful, a good place to study, semi good for the environment, and enjoyed spending time there. We were surprised to see that most students thought it was a good place to study as the atrium was almost completely empty every time we collected surveys, but attribute this result to many students being residents of the building.

In both buildings, students' responses in regards to our open-ended questions illustrated that while the majority of students shared the values of sustainability reflected in LEED certification, ultimately having the "LEED certified" title did not positively influence their perceptions of the building. Most students were unaware of LEED policies or stated frankly that they did not care, and that they were more concerned about a quiet, well-lit and multi-purpose study space. It is for this reason that we recommend that Dalhousie conduct further research to ensure that LEED-certified buildings are inclusive spaces that reflect the needs and values of all students, as well as furthering education into the many benefits of LEED to foster a sense of pride on campus.

Introduction

Leadership in Energy and Environmental Design (LEED) is currently one of the leading international voluntary green building certification systems, covering the five primary categories of sustainable building; location, water efficiency, energy and atmosphere, materials and resource credits, and indoor environmental quality (Matisoff, Noonan & Mazzolini, 2014). A building's certification is dependent on how it scores in each category, with extra points being awarded for additional effort and innovation, such as having a low environmental footprint during construction (Asdrubali, Baldinelli, Bianchi & Sambuco, 2015). LEED certification is market-driven by the associated financial gains from increased building efficiency and marketability (Altomonte & Schiavon, 2013).

LEED building standards fall into four levels: certified, silver, gold, and platinum. The gold standard requires buildings to reduce energy consumption by 25%, water consumption by 11%, and 19% reduction in maintenance costs, as well as 25% increase in occupant satisfaction and a 34% reduction in greenhouse gas emissions (U.S. Green Building Council, 2015). The silver standard has lower reductions, where as the platinum certification has higher reductions, with only one building in Halifax holding the platinum status (Canada Green Building Council, 2015).

In 2010, Dalhousie acknowledged the value of LEED certification when the green building policy was passed (Dalhousie University, 2016). This policy requires that all new buildings constructed by Dalhousie over 10,000 square feet should be at minimum LEED Gold certified (Dalhousie University, 2016). Currently at Dalhousie there are two LEED certified buildings (the Mona Campbell building and the Life Sciences Research Institute), and two buildings under consideration for LEED certification (the Ocean Sciences building and LeMarchant Place) (Dalhousie University, 2016).

Two of Dalhousie's Studley campus buildings hold a current or impending gold certification: Mona Campbell (current) and LeMarchant Place (impending gold), and the Ocean Sciences (impending silver) and Life Science Research building holding silver status. The Mona Campbell was the first Atlantic university building and first Dalhousie building to hold gold LEED status (Dalhousie University, 2012). On a global scale, Canada holds the top spot in LEED registration and certifications, followed by China and India (U.S. Green Building Council, 2015). This means that more and more commercial sites are following a more sustainable and environmentally friendly building and operating method.

In an effort to minimize global degradation and reach maximum energy efficiency, LEED principles revolve around renewables and sustainable resources to reduce emissions and

improve awareness (Pella, 2016). LEED aims to combine modern development while still holding the natural environment as the key to doing so. LEED holds a new approach to sustainable development in that the principals surrounding the certifications encourage development (rather than discourage), but in the most environmentally sustainable way.

Given that Dalhousie University has invested into making LEED a priority in future construction on campus, the purpose of this study is to examine how LEED certification influences undergraduate students. This exploratory study seeks to understand what undergraduate students on Dalhousie's Studley campus perceive to be the benefits and drawbacks of LEED certified buildings on campus and to make informed recommendations to Dalhousie University to improve undergraduate's use of LEED buildings. In order to achieve this end, LEED certified Mona Campbell building and LeMarchant Place were surveyed as these two buildings have a steady flow of students passing through each day. The scope of this project was limited to undergraduate students on Dalhousie University's Studley campus who frequent these two buildings.

Methods

Overview

Using a short survey, we explored the perceived benefits and drawbacks that undergraduate students have about the LEED certified Mona Campbell building and LeMarchant Place. Dalhousie University values being a leader in sustainability by meeting LEED's standards in order to reduce environmental impacts and create healthy social spaces for Dalhousie students. This exploratory study sought to understand if these goals are being met by gauging the perception held by undergraduate students in regards to these LEED-certified buildings, and to understand what could be improved in regards to LEED's influence on undergraduates' use of these spaces.

Description of Study Areas

By surveying students who are immediately interacting within the LEED certified buildings on Studley Campus we will gain a greater understanding of undergraduate student perceptions and awareness of the LEED spaces. The areas that we will be considering are the Mona Campbell Building and LeMarchant Place, seen in Figure 1. Opened September 2010, the Mona Campbell building is LEED gold certified and referred to as "Dalhousie's greenest building" (Dalhousie University, 2016). Features of the building include BubbleDeck concrete, Forestry Stewardship Council approved wood products, low-flow fixtures and interactive art. The Mona Campbell building hosts the College of Sustainability, the College of Continuing

Education, as well as classrooms and student commons (Dalhousie University, 2016). LeMarchant Place opened in (August/September) 2014 and is up for LEED gold certification with 86% of waste materials from the construction diverted from landfills. The building is equipped with 46 flat-plate solar panels, which are part of key energy efficiency measures that save 42% of the energy in comparison to typical buildings. LeMarchant is a mixed-use building that includes residence rooms, health/counselling services and international and exchange student services (Dalhousie University, 2016).

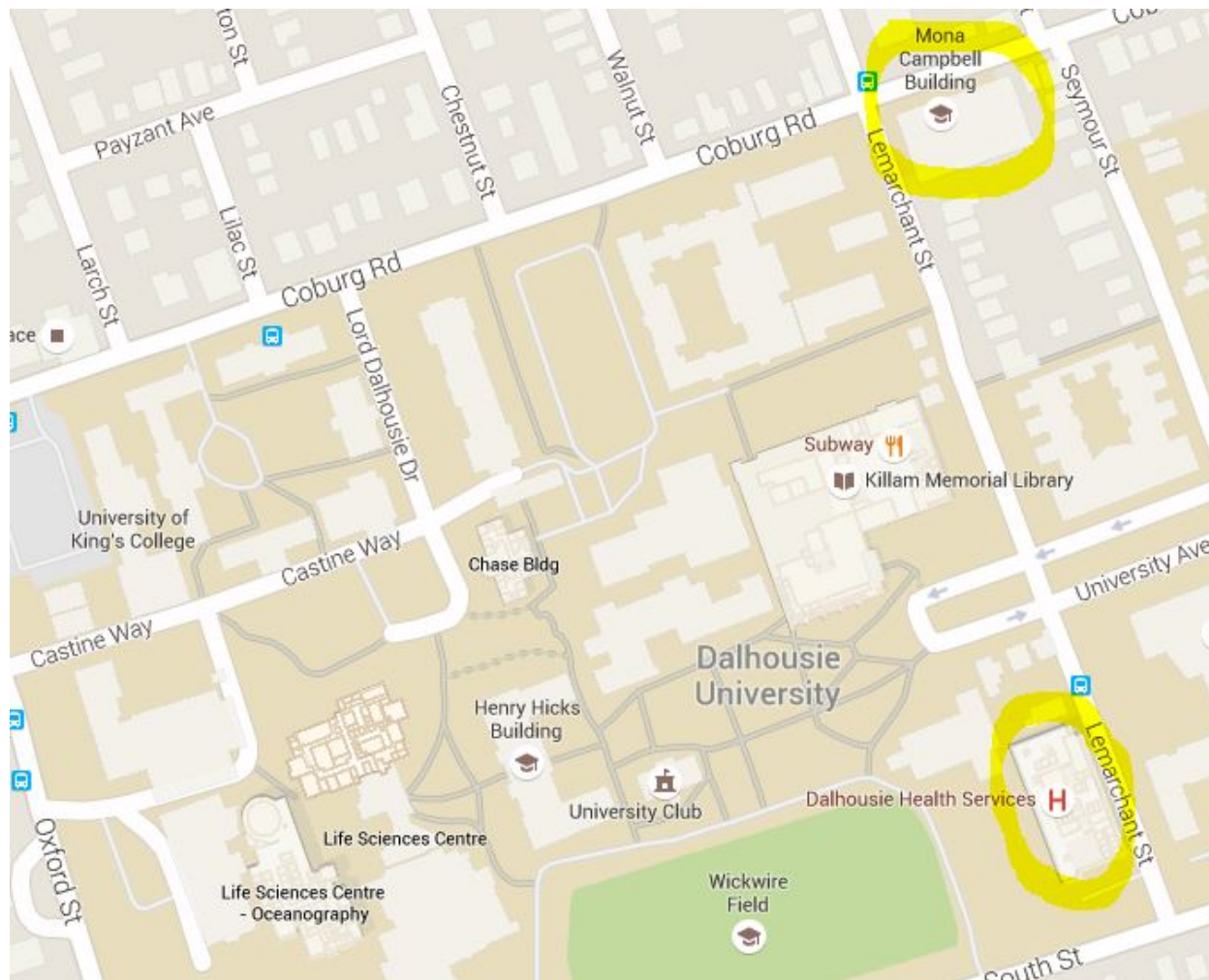


Fig. 1 Map of Dalhousie's Studley campus showing location of buildings being researched, where surveys were distributed to students. The Mona Campbell building is the upper right building, highlighted in yellow, and LeMarchant Place is located in the bottom right, also highlighted in yellow. Map retrieved from <http://www.dal.ca/campus-maps/maps.html>.

Study Design

We used a 10 question survey and heterogeneous, non-probabilistic purposive sampling of the Dalhousie undergraduate population in order to gain insight into the perceptions of students who frequent these spaces (See Appendix for copy of survey). As the nature of this exploratory study is inductive, non-probabilistic sampling is more appropriate, as formal representation of the undergraduate student body is not relevant to our desired conclusions (Atchison & Palys, 2008). Using the intercept method, we surveyed students who were using the space within the two LEED-certified buildings. We aimed to have a sample of 100-200 completed surveys based on sample sizes of previous ENVS 3502 research projects, in particular the "To what degree does attendance of ESS lectures relate to levels of civil engagement?" project of Winter 2015 (Balakmar, Cloutier, Mills, Moores, Moreau & Li, 2015), but given limited foot traffic in the LeMarchant atrium, we ended with a sample of 66 completed surveys. Our survey combined closed, open-ended, semantic differential and Likert-scale questions that asked about student's knowledge of the LEED policy on campus in order to assess the perceived benefits and drawbacks of this policy, if any, in a variety of ways. The combination of open and closed questions allowed for both a succinct survey as well as an opportunity for participants to express their opinions on LEED spaces in their own words. The use of semantic differential and Likert scale questions was suitable for exploring participants' varying attitudes towards these spaces in a quantifiable way by asking them to rate characteristics of the building (Atchison & Palys, 2014).

Instrumentation

After pilot testing our questionnaire and adjusting our questions where needed, we began the surveying process. Working in pairs to approach students in the main entrances of each building for hour-long intervals at different times of day, team members asked students if they would like to complete a survey regarding the environmental sustainability features of the building for an incentive of a small bag of candy. Participants were then given a clipboard with the 10 question survey that clearly stated that this survey is a project for an undergraduate research methods course, with Tarah Wright's contact information, the purpose of the study and a reminder that the survey is double-sided. Finally, we requested that participants answer the questions as honestly as possible, assured them of their anonymity and confidentiality and thanked them for their time. Surveys were color-coded for each building to limit confusion when analyzing data, and any incomplete surveys or surveys from students who were not undergraduates were not considered. We surveyed each building for a week at varying times of day as seen in Figure 2.

<i>Time</i>	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
11:30am-12:30pm	Sarah and Rebekah	Marijke and Reina			
1:00pm-2:00pm			Reina and Sarah		
2:30pm-3:30pm					Marijke and Aria
3:30pm-4:30pm				Aria and Rebekah	

Fig. 2 Schedule of survey collection. The first week of collection started on Monday March 21st, 2016 at the Mona Campbell building. The second week of surveys were collected from LeMarchant Place starting on Monday March 28th, 2016.

Potential Limitations and Delimitations

The limitations of this study are factors that we cannot control; such as the limited time we had to complete our research. This challenge, along with the possibility that undergraduates were not willing and/or able to participate in our survey posed a limitation on the accuracy of our research in representing undergraduate students, especially since we were unable to reach our desired sample size. This limitation was felt most strongly in surveying LeMarchant place, as the second few days of surveying provided limited results as there were so few students frequenting the atrium. It is for this reason we began surveying in the lobby of the residence in LeMarchant Place, which meant many respondents were current residents of the building and had limited use of the building for other reasons. Furthermore, since the Mona Campbell is home to the College of Sustainability we anticipated many respondents may be sustainability students, and as this was the case, their perspectives may have been over represented. As a final limitation to our project the results of our survey could be misleading due to the nature of self-reporting which is prone to misunderstanding or purposeful false answers (Reunamo, & Pipere, 2011).

The delimitations of this study are the decisions we have made in regards to the logistical factors of the study. These include surveying students at varying times of day on multiple days of the week as well as providing an incentive to encourage participation in our research. However, we delimited ourselves to only collecting surveys in the month of March, and this could potentially misrepresent the perceptions of students year-round. Furthermore, we delimited the scope of this project to exclude to Steele Ocean Sciences building even though it is up for LEED certification; the building is not frequented by undergraduates and is still partially under construction. We designed our survey to be fairly short with a mix of closed

and simple open-ended questions, both to ease analysis and to encourage participants to fully complete the survey. In our survey we aimed for depth rather than breadth with fewer questions in order to gain more complicated and descriptive responses (Atchison & Palys, 2014).

Results

From the surveys we received, we found both expected and surprising results from each location. We had assumed that because the College of Sustainability is located in the Mona Campbell Building, that a large portion of the students answering surveys would be Sustainability students. Due to us only asking for students' faculties and not their majors, we could not determine whether students were in the Sustainability program, but we did find that the majority were Arts and Social Science majors, as seen in Figure 4. When asked to explain their answers to questions 8 and 9 of the survey (as seen in the appendices), many students expressed that they were in the sustainability program. More students were in their 2nd year than any other, as seen in Figure 3, and the majority of students spend most of their time on Studley campus, which fits with the demographic we were hoping to study. Again to no surprise, 56% of students surveyed in the Mona Campbell building were aware of the concept of LEED certification, but 42% were not at all familiar with the features that were part of certifying a building. Along with asking their opinions of LEED, we asked students what they thought of the building simply as a building, as well as how often they used the space. Most students thought the Mona Campbell was beautiful, a fairly good place to study, good for the environment, and they generally enjoyed their time spent there. Most students used the space for appointments, social events, classes, and studying 0-2 times a week. After receiving the results, we realized it may have been unclear for us to put 0-2 times a week as one of the options, as this could mean that many people did not use it at all, while others in the same category could be in the Mona Campbell twice a week for all of these activities. This makes it difficult for us to analyze these results, and it is something that we would have changed looking back.

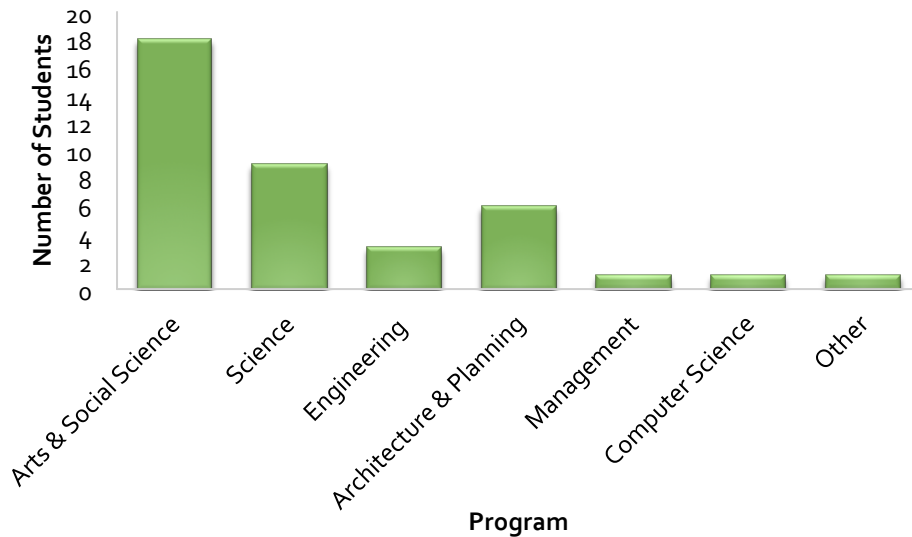


Fig. 3 Year of study of students surveyed in the Mona Campbell building from March 21st to 25th 2016.

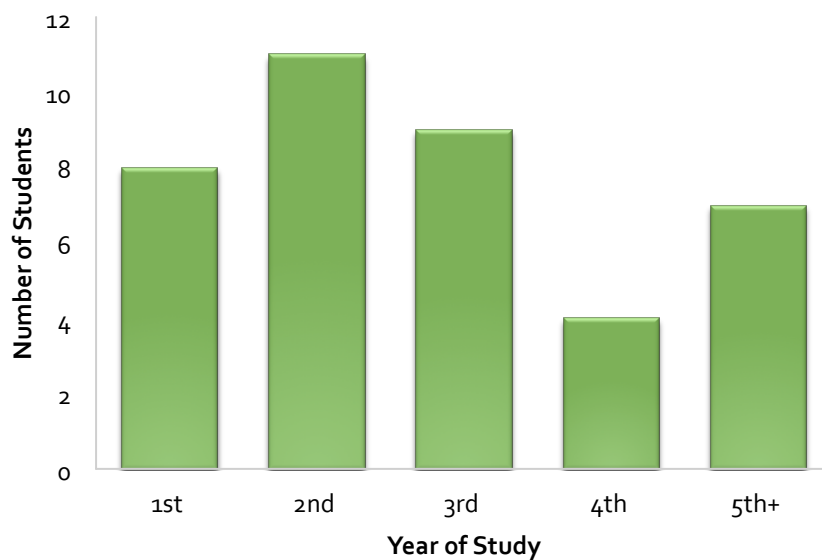


Fig. 4 Representation of faculties of students surveyed in the Mona Campbell building from March 21st to 25th 2016.

The surveys we received from LeMarchant Place had some similar results, but others that were very different. Most students were in their 2nd year, seen in Figure 5, spending most of their time on Studley campus, but the majority were Science students, as seen in Figure 6. 58% of students were not aware of LEED certification or the features related to it. Similar to the Mona Campbell, most students thought the building was beautiful, a good place to study, semi good for the environment, and enjoyed spending time there. We were surprised to see that most students thought it was a good place to study, as the atrium was almost completely empty every time we collected surveys. We believe that the reason for this response stems from the fact that about half of our surveying was done in the residence lobby, as we were not

receiving enough responses in the atrium. Students may have been referring to the study space they had in the residence as opposed to the study space available in the atrium, leading us to believe that we should have made this question clearer on the survey. Again similar to the results from the Mona Campbell, we found that students are in the building 0-2 times per week.

Students explained that they thought it was very important that Dalhousie become a leader in environmentally sustainable building practices, and that they felt it was important for such a large school to make an effort to make campus as sustainable as possible. The answers for the final two open-ended questions reflect this notion, as seen in Figures 7 and 8. The first cloud (blue) pertains to question 8 of the survey that asked the influence of LEED on student's decisions to use a building. As can be seen, the majority of participants did not know or did not care if a building was LEED certified. The second cloud (green) refers to question 9 which asked students how important it was that Dalhousie adopt green building practices, and it is seen that most students agreed that this was important or very important to them. This told us that a building having LEED certified features was not enough to make students choose that location as a study space, but that students share the same values that LEED tries to encompass. Ultimately, students want a more environmentally friendly campus, but are not concerned with the LEED status of a building, which seems to go against one of the LEED certification's gold status objectives of increased occupant satisfaction. Students explained that having study space, or areas for group meetings was more important than having a LEED stamp.

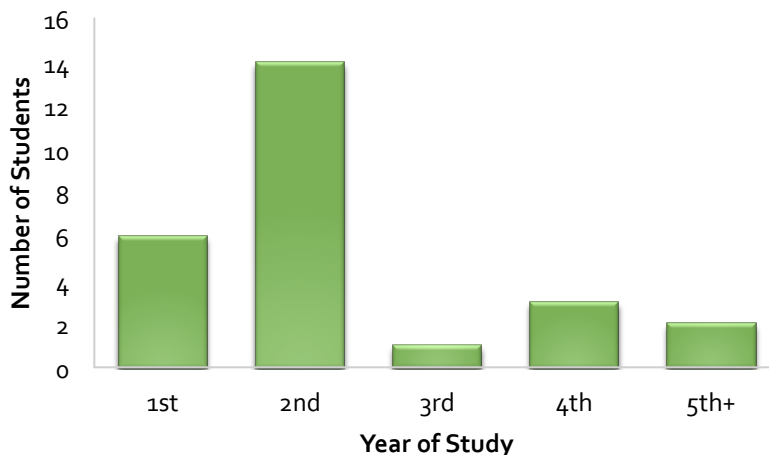


Fig. 5 Year of study of students surveyed in LeMarchant Place from March 28st to April 1st, 2016.

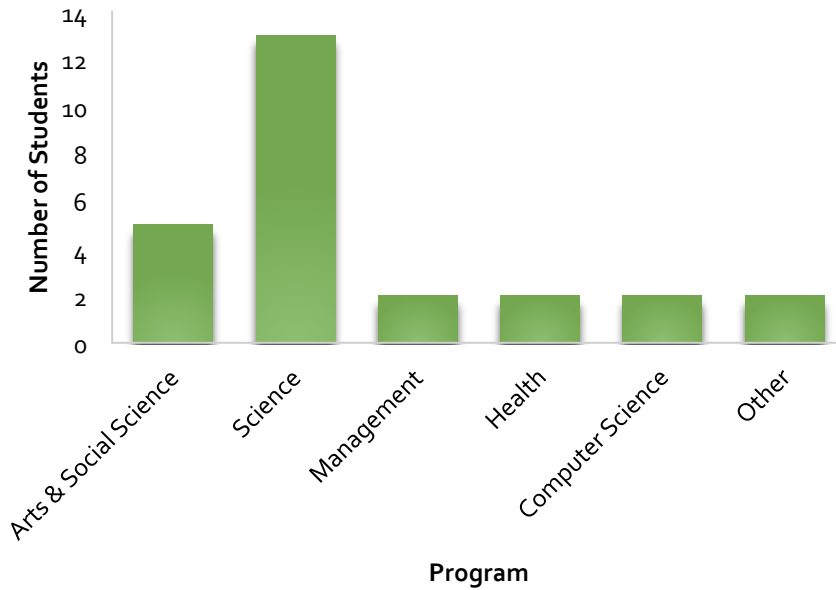


Fig. 6 Representation of faculties of students surveyed in LeMarchant Place from March 28st to April 1st, 2016.



Fig. 7 Word cloud made from the answers to survey question 8. Surveys were coded using *a priori* non-content specific qualitative coding system and the most prominent answers are displayed.



Fig. 8 Word cloud made from the answers to survey question 9. Surveys were coded using *a priori* non-content specific qualitative coding system and the most prominent answers are displayed.

Discussion

Purpose of research

The installment of Dalhousie's green development policy (2010) states that all new building projects over 10,000 square feet must strive to become LEED certified. Our research aim was to examine whether students valued this certification or if they were even aware of its existence and benefits. Furthermore, we wanted to know if this certification program made any measurable difference in the lives of undergraduate students on Studley campus, and if they valued the university making an effort toward becoming an environmental leader rather than laggard. We narrowed our search to look at one building holding gold LEED certification (Mona Campbell), and one building in the process of obtaining the same certification (LeMerchant Place). These buildings were chosen to reflect the populations whom frequented them the most, handing our surveys out on site to reach those populations most effectively. Our main objective was to gain knowledge reflecting the use of these buildings and the impact on the students who actually use them regularly. We looked to find out whether students value environmental stewardship in their study, social, and common spaces on campus, and if it was worthwhile to implement programs like this to reflect the student body.

Overview of significant findings

As previously stated above, our results were a mix of exactly what we expected, but also receiving, if nothing else, some surprising findings as well. The results from the Mona Campbell building were what was expected, as a large portion of that sample was at least familiar with LEED, and perceiving the benefits to be positive in their day to day activities as well as most feeling it was a step in the right direction for mitigating Dalhousie's impacts on climate change. On the other hand, the findings in LeMerchant place were more complicated. Since we did not survey in the same place everyday like we did in the Mona Campbell, we had a more diverse set of results (residents as well as those students whom used the space for their daily activities). This may have caused discrepancies in the data; however, working with what we collected, LeMerchant Place seemed to be a friendlier study space (likely because of its multiuse spaces (i.e. residence)), however, fewer people had any knowledge regarding LEED and its principles in this area compared to the Mona Campbell. Overall, the data reflected what we expected, with few discrepancies to make reasonable assumptions otherwise. Undergraduate students at Dalhousie seem to value environmental stewardship, however, pertaining particularly to LEED, most seem indifferent, if not somewhat uneducated on the matter.

A consideration of the findings in light of existing research studies

A study done by Central Oklahoma University in 2008 looked into the most effective and efficient initiatives in environmental stewardship in universities across the country. The study was broken down into three categories: environmental impact, financial effectiveness, and student engagement. It looked into a wide variety of initiatives including LEED certification to determine the most effective ways for universities to become leaders in overall environmental sustainability. What the study found was in regards to environmental effectiveness; LEED scoring in the top 3, and in financial effectiveness it scored top 4. LEED did not, however, make the cut for student engagement, but it is important to note that the top three initiatives in that category revolved around the availability of sustainability programs in universities (i.e. ESS), which Dalhousie already has available for students.

Taking into consideration this study and its results in comparison to our study and its results, everything added up. We found that while students at Dalhousie value and are generally committed to environmental stewardship, LEED initiatives do not necessarily engage students in sustainable efforts, and Central Oklahoma University concluded the same. While LEED is an effective method in reducing environmental impacts, it needs to be paired with more than that alone to be considered an effective way for universities to become more sustainable. Dalhousie has programs and degrees in environmental stewardship, and as the study identified, these are the most effective student engagement tools. On top of the environmental and financial assets LEED initiatives bring to the table, Dalhousie University is on the right track in its efforts for creating a more sustainable and environmentally sound campus.

Conclusion

This study contributes to Dalhousie University's understanding of undergraduate student's opinions of LEED certified buildings. This is important as Dalhousie has committed to investing in LEED certification and will continue to do so for future buildings. Given our findings, we recommend that the university make efforts to further educate students on the nature of LEED to further a sense of pride and sustainability on campus. Furthermore, they must ensure that these spaces are also enjoyed and used by the student population. Although the reason for the university choosing to certify new building may be linked to economic gains such as the opinions of potential investors, we believe that the opinions of students should still play a role in the future endeavours of the university.

After analyzing the results of our study, it is our recommendation that Dalhousie further research strategies to ensure that the Mona Campbell, LeMarchant Place, and other

buildings on campus are socially sustainable. If Dalhousie truly wishes to be a leader in sustainability, they cannot solely focus on environmental sustainability, as is the goal with LEED certification. True sustainability integrates the economy, environment, and society as these subjects are interrelated and deeply affect one another (McKenzie, 2004).

According to our research, a building's LEED certification does not influence if students will choose to spend their time there. Therefore, it is important that these spaces are good working and social spaces for students in order to ensure that the LEED certified buildings on campus are used to their maximum potential. This would involve researching what aspects of shared spaces are important to students, and how these can be implemented into LEED certified buildings. Additionally, Dalhousie should conduct research to ensure that these buildings are inclusive and welcoming spaces for all students. If Dalhousie University wants to be a leader in sustainability, it is important that the environmentally sustainable buildings constructed on campus are used and enjoyed by the student population. These shared spaces on campus should not just be examples of environmental sustainability, but social sustainability as well.

Acknowledgements

Thank you to our mentor Adam Cheeseman and Professor Tarah Wright for their guidance throughout this project. Thank you to Alex Dufort for lending her camera and making our Pecha Kucha come to life. Finally, thank you too all the participants of this study for taking the time to talk to us and giving us their opinions on LEED certification.

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Appendices

Appendix A: Survey

The objective of this survey is to explore how students perceive LeMarchant Place. This survey will ask questions about your opinion, but all answers will be kept anonymous (i.e. the research team will never know your name and any results from the project will not be attributed to you).

If you have any questions or are interested in the results of this survey, please contact our professor Tarah Wright at tarah.wright@dal.ca or our research mentor Adam Cheeseman at adam.cheeseman@dal.ca

1. Are you currently enrolled as an undergraduate student at Dalhousie University?

Please circle one.

YES **NO**

If **yes**, please specify your faculty _____

2. What year of study are you currently enrolled in? Please circle one.

1st **2nd** **3rd** **4th** **5+**

3. At which campus do you spend the majority of your time? Please circle one.

Studley **Carleton** **Sexton** **Truro**

4. Do you know what LEED (Leadership in Energy and Environmental Design) building certification is? Please circle one.

YES **NO**

5. Please evaluate the building you're in based on the following criteria by placing an "x" on the scales:

Beautiful	__ : __ : __ : __ : __ : __ : __	Ugly
Good place to study	__ : __ : __ : __ : __ : __ : __	Bad place to study
Bad for the environment	__ : __ : __ : __ : __ : __ : __	Good for the environment
Multi-Use	__ : __ : __ : __ : __ : __ : __	Single Use
I like spending time here	__ : __ : __ : __ : __ : __ : __	I do not like spending time here

6. How familiar are you with the features that are necessary for a building to be LEED-certified?

Not Familiar Somewhat Familiar Familiar Very Familiar

7. During a typical week, how do you use this building? Please check all that apply.

<i>Activity/times per week</i>	0-2 times	3-4 times	5-7 times	7-9 times	10 + times
Attending class/tutorial					
Academic appointments (with professors, advising, etc.)					
Social Events					
Individual Studying					
Group Studying					

Other (please indicate activity and roughly the number of times in a typical week):

8. Please circle to what degree you agree or disagree with the following statement: "I would be more inclined to study/attend classes in a building if I knew it had LEED certification."

Strongly Agree Somewhat Agree Somewhat Disagree Strongly Disagree

In a few words, please explain your answer:

9. How important is it to you that Dalhousie University become a leader in environmentally sustainable building practices? Please circle one.

Very Important Important Somewhat Important Not Important

In a few words, please explain your answer:

Thank you for your time!

Appendix B: Copy of Ethics Review

ENVIRONMENTAL PROGRAMMES
FACULTY OF SCIENCE
DALHOUSIE UNIVERSITY

APPLICATION FOR ETHICS REVIEW OF RESEARCH INVOLVING HUMAN PARTICIPANTS
UNDERGRADUATE THESES AND IN NON-THESIS COURSE PROJECTS

GENERAL INFORMATION

1. LEED Certification and Student Perception

2. Faculty Supervisor(s) Department Ext: e-mail:

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Adam Cheeseman, School for Resource and Environmental Studies,
Adam.Cheeseman@dal.ca*

3. Student Investigator(s) Department e-mail: Local Telephone Number:

*Aria Brunetti, Arts and Social Sciences, ar795393@dal.ca, 604-328-5254
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Sarah Aspinall, Science, sr732773@dal.ca, 905-580-0840
Marijke Germiquet-Vanderlinden, Management, mr814605@dal.ca, 587-434-7113
Rebekah Howse, Science, rb444216@dal.ca 902-877-6857*

4. Level of Project:

Non-thesis Course Project Undergraduate Graduate

Specify course and number: *ENVS/SUST 3502*

5. a. **Indicate the anticipated commencement date for this project:** *March 14, 2016*

b. **Indicate the anticipated completion date for this project:** *April 11, 2016*

SUMMARY OF PROPOSED RESEARCH**1. Purpose and Rationale for Proposed Research**

Using a short survey we will explore the perceived benefits and drawbacks that undergraduate students have about the LEED certified Mona Campbell building and LeMarchant Place. According to Dalhousie's sustainable building policy passed as of March 2011, all new buildings over 10, 000 square feet should be LEED gold certified or higher. Dalhousie University values being a leader in sustainability by meeting LEED's standards in order to reduce environmental impacts and create healthy social spaces for Dalhousie students. This exploratory study seeks to understand if these goals are being met by gauging the perception and awareness undergraduate students have in regards to these LEED-certified buildings, and to understand what could be improved in regards to LEED's influence on undergraduates' use of these spaces.

Methodology/Procedures

Which of the following procedures will be used? Provide a copy of all materials to be used in this study..

Survey(s) or questionnaire(s) (mail-back)

Survey(s) or questionnaire(s) (in person)

Computer-administered task(s) or survey(s)]

Interview(s) (in person)

Interview(s) (by telephone)

Focus group(s)

Audio taping

Videotaping

Analysis of secondary data (no involvement with human participants)

Unobtrusive observations

Other, specify _____

Provide a brief, sequential description of the procedures to be used in this study. For studies involving multiple procedures or sessions, the use of a flow chart is recommended.

Working in pairs to approach students in the main entrances of each building for hour-long intervals at different times of day, team members will ask students if they would like to complete a survey regarding the environmental sustainability features of the building for an incentive of a small bag of candy. Participants will then be given a clipboard with the survey that clearly states that this survey is a project for ENV5/SUST 3502 and Tarah Wright's contact information, the purpose of the study and a reminder that the survey is double-sided. Finally, we will request that participants answer the questions as honestly as possible, assure them of their anonymity and thank them for their time. Surveys will be color-coded for each building to limit confusion when analyzing data, and any incomplete surveys will not be considered. Completed surveys will immediately be put into a manila folder and participants will receive their incentive bag of candy. We plan to survey each building for a week, and the times are as follows:

Monday 11:30am-12:30pm: Sarah and Rebekah

Tuesday 11:30am-12:30pm: Marijke and Reina

Wednesday 1:00-2:00pm: Reina and Sarah

Thursday 3:30-4:30pm: Aria and Rebekah

Friday 2:30-3:30pm: Marijke and Aria

3. Participants Involved in the Study

Indicate who will be recruited as potential participants in this study.

Dalhousie Participants: Undergraduate students

Graduate students

Faculty and/or staff

Non-Dal Participants: Children

Adolescents

Adults

Seniors

Persons in Institutional Settings (e.g. Nursing Homes, Correctional

Facilities)

Other (specify) _____

b. Describe the potential participants in this study including group affiliation, gender, age range and any other special characteristics. If only one gender is to be recruited, provide a justification for this.

We plan to survey Dalhousie undergraduate students, approximately 18-25 years of age of all genders that are present in LeMarchant Place and the Mona Campbell building at the survey times.

c. **How many participants are expected to be involved in this study?** 100-200 participants.

4. Recruitment Process and Study Location

a. **From what source(s) will the potential participants be recruited?**

Dalhousie University undergraduate and/or graduate classes

Other Dalhousie sources (specify) Students in LeMarchant Place/Mona Campbell building's lobby.

Local School Boards

Halifax Community

Agencies

Businesses, Industries, Professions

Health care settings, nursing homes, correctional facilities, etc.

Other, specify (e.g. mailing lists) _____

Identify who will recruit potential participants and describe the recruitment process.

Provide a copy of any materials to be used for recruitment (e.g. posters(s), flyers, advertisement(s), letter(s), telephone and other verbal scripts).

All group members will recruit students to participate in our survey with the offer of an incentive small bag of candy purchased at the local Superstore.

5. Compensation of Participants

Will participants receive compensation (financial or otherwise) for participation? Yes [X]

No []

If **Yes**, provide details:

Small-sized candy bar, like those given out at Halloween.

Feedback to Participants

The objective of this survey is to obtain perceptions of LEED certified buildings from undergraduate students on Dalhousie Campus. This survey will ask questions about your opinion, but all answers will be kept anonymous and confidential. If you have any questions or are interested in the results of this survey, please contact Tarah Wright at tarah.wright@dal.ca or Adam Cheeseman at adam.cheeseman@dal.ca

Briefly describe the plans for provision of feedback and attach a copy of the feedback letter to be used. Wherever possible, written feedback should be provided to study participants including a statement of appreciation, details about the purpose and predictions of the study, contact information for the researchers, and the ethics review and clearance statement.

Note: When available, a copy of an executive summary of the study outcomes also should be provided to participants.

As surveys will remain confidential and we will not keep any identifying information, we will not be able to deliver an overview of our findings. However to maximize their benefits we will offer our contact information to participants so that if they so choose they can follow up and read our findings.

POTENTIAL BENEFITS FROM THE STUDY

1. Identify and describe any known or anticipated direct benefits to the participants from their involvement in the project.

Participants will benefit by sharing having their voices heard in regard to the LEED buildings they frequent.

2. ***Identify and describe any known or anticipated benefits to society from this study.***

By understanding what undergraduate students value/dislike in these LEED buildings we can work to make these spaces as socially sustainable as they are environmentally sustainable, and students will be more knowledgeable in the LEED policies and why Dalhousie invests in certification.

POTENTIAL RISKS TO PARTICIPANTS FROM THE STUDY

1. For each procedure used in this study, provide a description of any known or anticipated risks/stressors to the participants. Consider physiological, psychological, emotional, social, economic, legal, etc. risks/stressors

No known or anticipated risks
Explain why no risks are anticipated:

Participation in the survey is entirely voluntary and will only take a few moments of their time.

Minimal risk
Description of risks:

Greater than minimal risk
Description of risks:

2. Describe the procedures or safeguards in place to protect the physical and psychological health of the participants in light of the risks/stresses identified in Question 1.

INFORMED CONSENT PROCESS

Refer to: <http://pre.ethics.gc.ca/english/policystatement/section2.cfm>

1. **What process will be used to inform the potential participants about the study details and to obtain their consent for participation?**

- Information letter with written consent form; provide a copy
 Information letter with verbal consent; provide a copy
 Information/cover letter; provide a copy
 Other (specify) _____

2. **If written consent cannot be obtained from the potential participants, provide a justification.**

. A statement on the survey clearly states that this survey is a project for ENV5/SUST 3502 and lists Tarah Wright's contact information, the purpose of the study and participants completion of the survey will be taken as informed consent. While we survey we will approach all individuals to give equal opportunity for the voices of all students interacting within these spaces to be heard and we will ensure that we are respectful to students who decline to participate.

ANONYMITY OF PARTICIPANTS AND CONFIDENTIALITY OF DATA

Explain the procedures to be used to ensure anonymity of participants and confidentiality of data both during the research and in the release of the findings.

Participants cannot be completely anonymous as surveys will be completed face to face, however we will only be asking the most relevant identifying information (level of study, faculty) and nothing more. Participants will be given a clipboard with the survey with a statement that assures them of their confidentiality and thank them for their time.

Describe the procedures for securing written records, questionnaires, video/audio tapes and electronic data, etc.

Completed questionnaires will be kept in a labelled manila folder from the time of their completion to the data analysis phase.

3. Indicate how long the data will be securely stored, the storage location, and the method to be used for final disposition of the data.

[X] Paper Records

- Confidential shredding after _____ years
- Data will be retained indefinitely in a secure location
- Data will be retained until completion of specific course.

- Audio/Video Recordings
- Erasing of audio/video tapes after _____ years
- Data will be retained indefinitely in a secure location
- Data will be retained until completion of specific course.

- Electronic Data
- Erasing of electronic data after _____ years
- Data will be retained indefinitely in a secure location
- Data will be retained until completion of specific course.
- Other

(Provide details on type, retention period and final disposition, if applicable)

Specify storage location: *Researcher's respective homes.*

ATTACHMENTS

Please **check** below all appendices that are attached as part of your application package:

- Recruitment Materials:** A copy of any poster(s), flyer(s), advertisement(s), letter(s), telephone or other verbal script(s) used to recruit/gain access to participants.
- Information Letter and Consent Form(s).** Used in studies involving interaction with participants (e.g. interviews, testing, etc.)
- Information/Cover Letter(s).** Used in studies involving surveys or questionnaires.
- Parent Information Letter and Permission Form for studies involving minors.
- Materials:** A copy of all survey(s), questionnaire(s), interview questions, interview themes/sample questions for open-ended interviews, focus group questions, or any standardized tests used to collect data.

Ethics proposal been checked for eligibility according to the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans

Signature

Date

Appendix C: Copy of Preliminary Research Proposal

Project Definition

Climate change has been called the “existential crisis for the human species”, and this perspective is beginning to influence the innovations and decisions made in shaping the modern world (Naomi Klein, 2014). One of the trends that has emerged as a result is the application of ‘green’ building principles in urban planning (Mihajilovic, Sustersic, & Bogdanovic, 2016). Green building is a recent concept that gained traction in the 1990s that incorporates the principles of environmental stewardship into urban planning and construction (Mihajilovic, Sustersic, & Bogdanovic, 2016). Sustainable urban planning has been recognized as a vital aspect of future development, as it aims to reduce the environmental impact of buildings while considering the social well-being of its users (Bahauddin, Rahman & Ahmed, 2014). As a result, related certification systems have emerged and gained popularity over recent years (Mihajilovic, Sustersic, & Bogdanovic, 2016).

Leadership in Energy and Environmental Design (LEED) is currently one of the leading international voluntary green building certification systems, covering the five primary categories of sustainable building location, water efficiency, energy and atmosphere, materials and resource credits, and indoor environmental quality (Matisoff, Noonan & Mazzolini, 2014).. A building’s certification is dependent on how it scores in each category, with extra points being awarded for additional effort and innovation, such as a low environmental footprint during construction (Asdrubali, Baldinelli, Bianchi & Sambuco, 2015) LEED certification is market-driven by the associated financial gains from increased building efficiency and marketability (Altomonte & Shiavon, 2013). In 2010, Dalhousie acknowledged the value of LEED certification when the green building policy was passed (Dalhousie University, 2016). This policy requires that all new buildings built by Dalhousie over 10,000 square feet should be at minimum LEED Gold certified (Dalhousie University, 2016). Currently at Dalhousie there are two LEED certified buildings (the Mona Campbell building and the Life Sciences Research Institute), and two buildings under consideration for LEED certification (the Ocean Sciences building and LeMarchant Place) (Dalhousie University, 2016).

The purpose of this study is to examine LEED certification in the context of university campuses. Our research team is interested in what undergraduate students on Dalhousie’s Studley campus perceive to be the benefits and drawbacks of LEED certified buildings on campus. We will specifically be looking at the LEED certified Mona Campbell building and LeMarchant Place, as these two buildings have a steady flow of students passing through each day. The scope of this project will be limited to undergraduate students on Dalhousie University’s Studley campus who frequent these two buildings. We will access this population by handing out surveys in both the Mona Campbell building and LeMarchant Place at various points in the day over a two-week period. We will be using a heterogeneous, non-probabilistic sampling method. We are concerned only with the students who use the LEED certified buildings on campus, therefore we are not looking for formal representation of the student population.

The results of this study will benefit Dalhousie by providing information on student's perceptions of LEED certified buildings on campus. LEED certification requires a large amount of university resources, and it will be useful for Dalhousie to understand how the students who frequent these buildings perceive the results of these efforts. Ways in which student opinion can be improved may be highlighted, as well as features of LEED certified buildings that can be improved upon in order to increase student use. This research may also be useful by highlighting how aware students are of the LEED status of these buildings, especially since the Mona Campbell is the only building on campus where the sustainable features of the building are prominently displayed. This information can help improve the environmental education and awareness of the students who frequent the LEED certified buildings on campus.

Background

Since established in 2000, the LEED certification program has more than 13.8 billion square feet of building spaces that are certified worldwide (U.S. Green Building Council, 2015). This means that a substantial part of the global market is prepared to ensure greener development and less environmental impact in regards to infrastructure. LEED was established by the U.S Green Building Council to enhance environmental awareness among builders and architects (Suzer, 2015).

LEED building standards fall into four levels: certified, silver, gold, and platinum. The gold standard requires buildings to reduce energy consumption by 25%, water consumption by 11%, and 19% reduction in maintenance costs, as well as 25% increase in occupant satisfaction and a 34% reduction in greenhouse gas emissions (U.S. Green Building Council, 2015). The silver standard has lower reductions, where as the platinum certification has higher reductions, with only one building in Halifax holding the platinum status (Canada Green Building Council, 2015).

Two of Dalhousie's Studley campus buildings hold a current or impending gold certification: Mona Campbell (current) and LeMarchant Place (impending what level??), and the Ocean Sciences (impending silver) and Life Science Research building holding silver status. The Mona Campbell was the first Atlantic university building and first Dalhousie building to hold gold LEED status (Dalhousie University, 2012). On a global scale, Canada holds the top spot in LEED registration and certifications, followed by China and India (U.S. Green Building Council, 2015). This means that more and more commercial sites are following a more sustainable and environmentally friendly building and operating method.

In an effort to minimize global degradation and reach maximum energy efficiency, LEED principles revolve around renewables and sustainable resources to reduce emissions and improve awareness (Pella, 2016). LEED aims to combine modern development while still holding the natural environment as the key to doing so. LEED holds a new approach to sustainable development in that the principals surrounding the certifications encourage development (rather than discourage), but in the most environmentally sustainable way.

Rationale

With Dalhousie's push towards LEED certification on all buildings over 10,000 square feet, this is a current topic of interest for our group to study (Dalhousie University, 2016). As

Dalhousie grows and develops, the infrastructure grows along with it, meaning that LEED buildings are an up and coming area of interest. With any major development at Dalhousie in the foreseeable future needing a LEED certification (according to the new green development policy), understanding the benefits and costs are important. On top of this, examining the relationship students have with LEED spaces are also an integral part of having LEED buildings on Dalhousie campus. On an everyday basis, buildings can seem insignificant, but the way they are designed, built and operated makes a huge difference in costs, emissions, and the impacts these spaces have on people.

Throughout the term, the benefits and costs of LEED buildings, and the relationship (if there is one) between these spaces and the students who use them, will be examined to determine the degree to which these two LEED spaces on Studley campus impact students. Since establishing that LEED is a common variable in current and foreseeable future building projects at Dalhousie, establishing if it is a worth while endeavour, strictly based on the impacts this certification has on students or if it makes any difference to them at all is worth researching. Do the undergrad students on the Studley campus place any value on LEED spaces, above and beyond any other building? Does putting the extra time, money and energy into endeavours like this make a difference to the people who use them most? Throughout the project these questions will be identified, examined and interpreted.

Methods

Overview

Using a short survey we will explore the perceived benefits and drawbacks that undergraduate students have about the LEED certified Mona Campbell building and LeMarchant Place. Dalhousie University values being a leader in sustainability by meeting LEED's standards in order to reduce environmental impacts and create healthy social spaces for Dalhousie students. This exploratory study seeks to understand if these goals are being met by gauging the perception held by undergraduate students in regards to these LEED-certified buildings, and to understand what could be improved in regards to LEED's influence on undergraduates' use of these spaces.

Description of Study Areas

By surveying students who are immediately interacting within the LEED certified buildings on Studley Campus we will gain a greater understanding of undergraduate student perceptions and awareness of the LEED spaces. The areas that we will be considering are the Mona Campbell Building and LeMarchant Place. Opened September 2010, the Mona Campbell building is LEED gold certified and referred to as "Dalhousie's greenest building" (Dalhousie University, 2016). Features of the building include BubbleDeck concrete, Forestry Stewardship Council approved wood products, low-flow fixtures and interactive art. The Mona Campbell building hosts the College of Sustainability, the College of Continuing Education as well as classrooms and student commons (Dalhousie University, 2016). LeMarchant Place opened in (month?) 2014 and is up for LEED gold certification with 86% of waste materials from the construction diverted from landfills. The building is equipped with 46 flat-plate solar panels, which are part of key energy efficiency measures that save 42% of the energy in comparison to

typical buildings. LeMarchant is a mixed-use building that includes residence rooms, health/counselling services and international and exchange student services (Dalhousie University, 2016).

Study Design

Using a 10 question survey, we will gain heterogeneous, non-probabilistic purposive sampling of the Dalhousie undergraduate population in order to gain insight into the perceptions of students who frequent these spaces (See Appendix for copy of survey). As the nature of this exploratory study is inductive, non-probabilistic sampling is more appropriate, as formal representation of the undergraduate student body is not relevant to our desired conclusions (Atchison & Palys, 2008). Using the intercept method we will survey students who are using the space within the two LEED-certified buildings. We aim to have a sample within the range 100-200 completed surveys based on sample sizes of previous ENVS 3502 research projects, in particular the "To what degree does attendance of ESS lectures relate to levels of civil engagement?" project of Winter 2015. This survey will combine closed, open-ended, semantic differential and Likert-scale questions that will ask about their knowledge of the LEED policy on campus in order to assess the perceived benefits and drawbacks of this policy, if any, in a variety of ways. The combination of open and closed questions will allow for both a succinct survey as well as an opportunity for participants to express their opinions on LEED spaces in their own words. The use of semantic differential and Likert scale questions is appropriate for exploring participants' varying attitudes towards these spaces in a quantifiable way by asking them to rate characteristics (Atchison & Palys, 2014). Through the use of Excel spreadsheets, we will analyze the data using descriptive statistics to understand the dispersion in each distribution. From this we will create frequency tables, charts and graphs for each building as well as both buildings combined that viewers will be able to clearly understand (Atchison & Palys, 2014). We will be converting our data into descriptive statistics by hand as we will be using physical copies of our survey to get results, and any open-ended questions will be analyzed by assigned group members for common words and opinions. We will use *a priori* non-content specific qualitative coding to analyze responses to create a word bubble to display data, and our results will inform any recommendations we make to improve these spaces.

Instrumentation

After pilot testing our questionnaire and adjusting our questions where needed, we will begin the surveying process. Working in pairs to approach students in the main entrances of each building for hour-long intervals at different times of day, team members will ask students if they would like to complete a survey regarding the environmental sustainability features of the building for an incentive of a small bag of candy. Participants will then be given a clipboard with the 10 question survey that clearly states that this survey is a project for an undergraduate research methods course and Tarah Wright's contact information, the purpose of the study and a reminder that the survey is double-sided. Finally, we will request that participants answer the questions as honestly as possible, assure them of their anonymity and confidentiality and thank them for their. Surveys will be color-coded for each building to limit confusion when analyzing data, and any incomplete surveys will not be considered. Completed surveys will

immediately be put into a manila folder and participants will receive their incentive bag of candy. We plan to survey each building for a week at varying time of day as follows;

<i>Time</i>	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
11:30am-12:30pm	Sarah and Rebekah	Marijke and Reina			
1:00pm-2:00pm			Reina and Sarah		
2:30pm-3:30pm					Marijke and Aria
3:30pm-4:30pm				Aria and Rebekah	

Potential Limitations and Delimitations

The limitations of this study are factors that we cannot control; such as the limited time we have to complete our research. This challenge, along with the possibility that undergraduates will not be willing and/or able to participate in our survey pose a limitation on the accuracy of our research in representing undergraduate students, especially if we are unable to reach our desired sample size. Furthermore, since the Mona Campbell is home to the College of Sustainability many respondents may be sustainability students and their perspectives may be over represented. As a final limitation to our project the results of our survey could be misleading due to the nature of self-reporting which is prone to misunderstanding or purposeful false answers (Reunamo, & Pipere, 2011). The delimitations of this study are the decisions we have made in regards to the logistical factors of the study. These include surveying students at varying times of day on multiple days of the week as well as providing an incentive to encourage participation in our research. However, we are delimiting ourselves to only collecting surveys to the month of March, and this could potentially misrepresent the perceptions of students year-round. Furthermore, we are delimiting the scope of this project to exclude to Steele Ocean Sciences building even though it is up for LEED certification; the building is not frequented by undergraduates and is still partially under construction. We designed our survey to be fairly short with a mix of closed and simple open-ended questions, both to ease analysis and to encourage participants to fully complete the survey. In our survey we aim for depth rather than breadth with fewer questions in order to gain more complicated and descriptive responses (Atchison & Palys, 2014).

Ethics

As this project works with human participants, research ethics are an important consideration in our research (see Appendix for application to the ethics review board). First, to respect the undergraduate students participating in the study all will be verbally informed of the nature of the survey as well as in a disclaimer at the start of the survey, and their participation will be taken as informed consent. Their confidentiality will be assured as well, and only the most basic and relevant identifying information will be asked (level of study

within the university and faculty). As surveys will remain confidential and we will not keep any identifying information, we will not be able to deliver an overview of our findings. However to maximize their benefits we will offer our contact information to participants so that if they so choose they can follow up and read our findings. While we survey we will approach all individuals to give equal opportunity for the voices of all students interacting within these spaces to be heard, and ensure that we are respectful to students who decline to participate.

Schedule and Budget

For our project, we are allowing two weeks for data collection so that there will be enough time to analyze the data before results are needed. The Pecha Kucha presentation will be completed by March 31st with the help of all group members. We have set this deadline 3 days before the final due date to leave room for any change in plans, such as the data taking longer to analyze or last minute changes that need to be made. The final report will be completed by April 7th, 4 days before the deadline, again to allow room for any last minute changes, or in case other class schedules conflict with completion. Further details can be found in the calendar attached in the appendices. Apart from the data collection in which select group members are assigned to certain days, all group members will take part in analyzing the data and completing both the Pecha Kucha and final report.

The costs associated with completing our research, as listed in the appendices, have to do with data collection. In order to retrieve results, we will hand out paper copies of our survey on clipboards with pens provided for convenience and efficiency. As a way to thank our survey-takers, we will be handing out candy as students complete the survey. Paper amounts were chosen based on the maximum amount of surveys we hope to receive. We have taken into account costs of material at current day prices, as well as printing costs. In an effort to save time and reduce any extra steps in completing our project, we have chosen to pay these costs ourselves instead of applying for funding. The total costs will be split between all 5 group members equally.

Deliverables and Communication Plan

The deliverable for this study will be in the format of a final report. This final report will include the following:

- * Information regarding the understanding the student body has pertaining to LEED certification
- * Data regarding the level of importance towards environmental initiatives for the Dalhousie Student body.

The information collected from this study, will help build an understanding towards the ways in which the Dalhousie student body interacts and values LEED certified buildings. We will conduct surveys at two LEED certified buildings on Dalhousie campus over a five-day

period, and this project aims to provide useful data determining the students' perceptions of the certification process.

Communication Plan

Objective

The objective of this study is the collection of information on the perceptions of Dalhousie University Students towards LEED certified buildings on campus. The information will assist in the assessment of how students value the certification and if it influences their decision to frequent those buildings.

Target Audience

The target audience for this study is the undergraduate student body at Dalhousie University's Studley Campus.

Tools

In this study, we will be using a heterogeneous, non-probabilistic sampling method in the form of a survey conducted in the Mona Campbell building and LeMarchant building, and coding.

Evaluation

After the information has been collected from the surveys and properly coded, we will evaluate our findings and decide on an appropriate method of displaying our results.

Communication Process

The processes involved in this study will be executed through face-to-face communication with survey participants, as well as group meetings and online communications. Once the data is compiled, we will meet all together and create a code and a presentation.

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Appendices

Appendix A

Budget breakdown for research project:

Materials	Amount	Cost
Paper	200 sheets @ \$0.02/sheet	\$4.50
Printing	200 sheets @ \$0.20/ sheet	\$40.00
Clipboards	5 @ \$1.50/clipboard	\$7.50
Pens	5 @ \$.17/pen	\$0.83
Candy	200 @ \$2.00/pen	\$8.00
	Total	\$60.83

Appendix B

Survey Questions:

The objective of this survey is to obtain perceptions of LEED certified buildings from undergraduate students on Dalhousie Campus. This survey will ask questions about your opinion, but all answers will be kept anonymous and confidential. If you have any questions or are interested in the results of this survey, please contact Tarah Wright at tarah.wright@dal.ca or Adam Cheeseman at adam.cheeseman@dal.ca

1. Are you currently enrolled as an undergraduate student at Dalhousie University? Please circle one.

YES NO

If Yes, please specify your faculty _____

2. What year of study are you currently enrolled in? Please circle one.

1st 2nd 3rd 4th 4+

3. At which campus do you spend the majority of your time? Please circle one.

Studley Carleton Sexton Truro

4. How important is it to you that Dalhousie University become a leader in environmentally sustainable building practices? Please circle one.

Very Important Important Somewhat Important Not Important

5. Do you know what LEED (Leadership in Energy and Environmental Design) building certification is? Please circle one.

YES NO NOT SURE

6. In your opinion, how would a LEED certification influence your desire to spend time in a building on Studley Campus? Please circle one.

Strongly Influence Somewhat Influence No Influence

7. Please evaluate the building you're in based on the following criteria

Beautiful	: : : : : : :	Ugly
Good place to study	: : : : : : :	Bad place to study
Bad for the environment	: : : : : : :	Good for the environment
Multi-Use	: : : : : : :	Single Use
Bad social space	: : : : : : :	Good social space

8. Do you use this space by choice, or because you have schedule classes or appointments? Please circle one.

By choice Scheduled class or appointment

9. Please circle how much you agree with the following statement: "I would be more inclined to study/attend classes in a building if I knew it had LEED certification."

Strongly Agree Somewhat Agree Somewhat Disagree Strongly Disagree

10. In a few words, please explain what (if anything) could be done to improve the building you are in for you as a student.

Appendix C: Research Schedule

SUN	MON	TUE	WED	THU	FRI	Sat
		March 1	2	3	4	5
				Prelimin-ary Proposal Due		
6	7	8	9	10	11	12
	Print surveys	Confirm complete- ness of surveys		Purchase materials, candy. Organize		
13	14	15	16	17	18	19
	Sarah and Rebekah 11:30-12:30 Mona	Marijke and Reina 11:30- 12:30 Mona	Reina and Sarah 1:00- 2:00 Mona	Aria and Rebekah 3:30- 4:30 Mona	Marijke and Aria 2:30-3:30 Mona	
20	21	22	23	24	25	26
	Sarah and Rebekah 11:30-12:30 LeMarchant	Marijke and Reina 11:30- 12:30 LeMarchant	Reina and Sarah 1:00- 2:00 LeMarchant	Aria and Rebekah 3:30- 4:30 LeMarchant	Marijke and Aria 2:30-3:30 LeMarchant	
27	28	29	30	31	April 1	2
	Analyze data All group members	Analyze data All group members in class	Analyze data All group members if needed	Complete Pecha Kucha powerpoint		
3	4	5	6	7	8	9
Pecha Kucha due		Pecha Kucha Presenta-tion		Finalize report, make any changes needed	Peer Assess- ment Due	
10	11	12	13	14	15	16
	Final Report Due					

