



Annual Report

2018-2019





A Review of 2018/2019

This past year, the students, staff, and members of the community that make up and support McMaster's Academic Sustainability Programs (ASP) Office have made great strides in advancing the Office's mission to *inspire in all students a desire for continued learning and inquiry through experiential education*. To achieve this mission, through our various programs, students are provided with unique opportunities for interdisciplinary, student-led, community-based, and experiential learning about the complex issues of sustainability.

McMaster's commitment to sustainability is evident in its placement in the first rankings to assess university impact related to the UN's Sustainable Development Goals. McMaster ranked second in the world in the 2019 Impact Rankings by Times Higher Education. As part of our ongoing commitment to the goals, we've included the SDG(s) that most connect with the projects in this report.

Although it is only in its sixth year of existence, the Interdisciplinary Minor in Sustainability is now the fourth largest minor by enrollment. Since our last reporting in the fall of 2018, there have been 11 courses added to the Minor Course List, the creation of a student-led sub-committee to support the work of the Minor Committee made up of staff and faculty, and 39 more graduates with the Minor. Although the growth of the Minor is noteworthy, I am particularly inspired by the collaboration between staff, faculty, and students to identify opportunities and act to implement positive changes for the Minor.

The Sustainable Future Program has also seen substantial growth since the first course was offered in the winter of 2013. In response to continued growing demand, the Program has been further expanded through increased enrollment capacity, as well as the addition of a new course. With expansion, we anticipate that over 750 students, representing all Faculties, will successfully complete a SUSTAIN course in the 2019/20 academic year.

Through the Sustainability Internship Program and Graduate/Undergraduate Collaboration in Experiential Learning Program, we have supported 35 students in their self-directed learning. Each year, we are excited by their increasingly unique and diverse connections to sustainability.

We also continue to enhance and grow our relationships within the broader community, through our focus on collaboration, reciprocity, continuity, and active engagement.

I aspire that this annual report comes to represent more than a collection of accomplishments. I hope you will reflect on the learning that has taken place and that has enabled students to grow from their experiences, that you acknowledge the diverse collaborations formed and fostered, and that you find inspiration in the stories of the individuals who have shared them with you.

I sincerely hope that you enjoy reading about these projects as much as I have enjoyed working with the individuals who created them.



Kate Whalen
Senior Manager
Academic Sustainability Programs

Mission, Objectives, and Programs

Mission

To inspire in all students a desire for continued learning and inquiry through experiential education.

Objectives

To realize our mission, we strive to provide all McMaster students with the opportunity to take part in interdisciplinary, student-led, community-based, and experiential learning about sustainability.

Priority Programs

Key to achieving our objectives and inspiring lifelong learning is developing and fostering strong connections, both within the University and the broader community, and supporting students to develop the knowledge, skills, and abilities to be successful in their learning. We aim to do through our four main programs:

- **Interdisciplinary Minor in Sustainability:** An opportunity for students to choose from a list of sustainability courses from Faculties across campus and tailor a minor that complements their undergraduate degree and education.
- **Sustainable Future Program:** A suite of undergraduate courses focused on sustainability. Courses are open to all students, independent of their home Faculty.
- **Sustainability Internship Program:** An opportunity for undergraduate students to develop and implement a real-world sustainability project and receive course credit from their home Faculty upon successful completion.
- **Graduate/Undergraduate Collaboration in Experiential Learning (GUCEL) Program:** An opportunity for graduate students to work in collaboration with undergraduate students to develop and implement a real-world sustainability project and receive academic recognition upon successful completion.

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Interdisciplinary Minor in Sustainability



Interdisciplinary Minor in Sustainability

Addressing sustainability in our society poses complex challenges that require interdisciplinary solutions. McMaster created the Interdisciplinary Minor in Sustainability with the goal of developing students' interdisciplinary knowledge and understanding of sustainability. To achieve this goal, the Minor provides a path for students to study diverse aspects of sustainability by taking courses from different Faculties and integrating them into a cohesive whole.

Objectives

- Encourage opportunities for student experiential learning about sustainability
- Provide opportunities to meaningfully engage with communities both within and outside of McMaster
- Offer a wide selection of courses to enable students to choose the sustainability emphasis that is right for them and to pursue courses that will further their individual learning objectives
- Foster engagement among students, faculty, and staff across campus, facilitating interdisciplinary learning

Reporting

Through the development and implementation of McMaster's Interdisciplinary Minor in Sustainability, students are now able to choose from over 88 courses from all Faculties across campus to gain a truly interdisciplinary perspective of sustainability, as well as tailor a minor that complements their major. In only five years of operation, 115 students have achieved an Interdisciplinary Minor in Sustainability.

Collaborators

First and foremost, we would like to recognize the Arts & Science Program for providing integral support for the implementation and development of the Minor — specifically, Arts & Science Director, Jean Wilson, and Program Administrators, Shelley Anderson, Rebecca Bishop, and Madeline Van Impe.

The Minor would not be possible without the hard work and dedication of the past and current members of the Interdisciplinary Minor in Sustainability Committee, including the newly-developed Student Sub-committee; the Arts & Science Program for providing an administrative home for the Minor; the faculty members who have opened their courses for inclusion and helped communicate the Minor; the staff members, including academic advisors, who have provided advice and guidance throughout; and the dozens of students who have shown their support by taking the Minor and working with us through its development.

Interdisciplinary Minor in Sustainability: Year in Review

McMaster launched the Interdisciplinary Minor in Sustainability in September 2014 to enable students from all Faculties to gain an interdisciplinary understanding of environmental, social, and economic sustainability.

Enhancing the flexibility and accessibility of the Minor, and communicating the opportunity to students early on in their academic journey, are integral to providing a positive and meaningful learning experience and ensuring long-term success of the Minor. As such, the following objectives have been, and will continue to be, the primary focus in the early stages of the Minor's implementation and development.

2018/2019 Objectives

- Maintain the Minor Course List by reviewing applicable courses from all Faculties and incorporating those that align with the goals of the Minor
- Enhance, clarify, and streamline related administrative processes to ensure that staff can effectively guide students and that students can easily navigate and access the Minor
- Promote the Minor to incoming and current students through their home Faculty

Reporting

Since our last reporting, 11 courses from five Faculties and the Arts & Science Program were proposed for inclusion on the Minor Course List, which were approved by the committee, communicated online, and (due to timelines for administrative processing) will appear in the 2020-21 Course Calendar.

In April 2015, three students graduated with an Interdisciplinary Minor in Sustainability followed by 14 students in 2016, 23 students in 2017, 36 students in 2018, and 39 in 2019. These students come from the Faculties or programs of Arts & Science, Business, Engineering, Humanities, Science, and Social Sciences. We are encouraged by these numbers as they demonstrate the strong support provided by staff, faculty, and students across campus as well as the growing interest and demand for the Minor among students.

Alongside this early success, improvements have been made to ensure the Minor achieves its objectives:

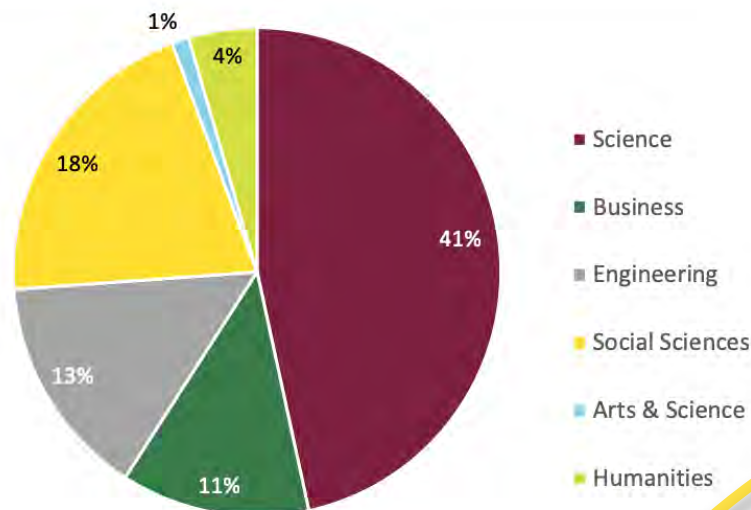
- McMaster's Interdisciplinary Minor in Sustainability Committee members reviewed new and existing courses from their specific Faculty to determine if new courses should be added and to ensure that all pre-existing courses were all still acceptable to be included on the Minor Course List going forward. While new courses were added, none were removed this past year.
- All newly added courses were communicated to the appropriate administrators in each Faculty, to ensure they could effectively guide students pursuing the Minor.
- The Committee's biggest accomplishment this year was the creation of the student-led sub-committee, which was created to support faculty and staff of the Minor Committee by providing student perspectives and incorporating student voices in decisions and directions. The accomplishments of the first Student Sub-committee are deserving of their own section, which can be found in the pages to follow.

While these efforts have been quite successful, we continue to strive for stronger representation from all Faculties in the Minor and on the Student Sub-committee.

Collaborators

We would like to thank all members of the Interdisciplinary Minor in Sustainability Committee for their support: Brent McKnight, Assistant Professor, DeGroot School of Business; Kate Whalen, Senior Manager, Academic Sustainability Programs Office; Shelley Anderson, Program Administrator, Arts & Science Program; Luc Bernier, Assistant Professor, School of Geography and Earth Sciences; Madeline Van Impe, Program Administrator, Arts & Science Program; Rebecca Bishop, Program Administrator, Arts & Science Program; Cameron Churchill, Director, Engineering and Society Program; Carlos Filipe, Professor/Chair, Chemical Engineering; Chad Harvey, Assistant Professor, School of Interdisciplinary Science; John MacLachlan, Associate Director, MacPherson Institute; Judy Major-Girardin, Professor, School of the Arts; Shanti Morell-Hart, Assistant Professor, Anthropology; Dean Mountain, Professor, DeGroot School of Business; Susie O'Brien, Professor and Chair, Department of English and Cultural Studies; Maureen Padden, Associate Professor, School of Geography and Earth Sciences; Sandra Preston, Assistant Professor, School of Social Work; Stacey Ritz, Assistant Dean of Education Services, Faculty of Health Sciences; and Jean Wilson, Director, Arts & Science Program. We would also like to thank the academic advisors and communication teams of each Faculty, as well as the countless students, faculty, and staff who have contributed to the development and enhancement of McMaster's Interdisciplinary Minor in Sustainability.

Minor Graduates, 2015 - 2019



Interdisciplinary Minor in Sustainability Student Sub-committee

Year in Review:

September 2014 marked the beginning of the Interdisciplinary Minor in Sustainability committee, whose role is to guide the direction of the Minor. To engage students in the process, a Student Sub-committee was created in September 2018. The goals of the Student Sub-committee are two-fold – to generate awareness of the Minor and to create a community amongst students pursuing the Minor.

2018/2019 Objectives

- Promote the Minor through in-person student engagement
- Increase the Minor's online presence
- Bring Minor students together through co-hosting engaging sustainability events

Reporting

In September 2018, five undergraduate students and one PhD student came together to form the Interdisciplinary Minor in Sustainability Student Sub-committee. Coordinated by Abbie Little, the group met weekly to plan and implement initiatives that would help reach their goals. Their achievements are shown graphically in Figure 1 and outlined below:



Sub-committee Coordinator, Abbie; member Andrés; and MSU Maroon volunteer, Max; at the Composting Education Week event
Photo credit: Connor MacLean

- Engaged nearly 800 students through four class talks in courses from three different Faculties. Each of these courses were specifically targeted because they were large, lower-level classes, and on the Minor Course List.
- Tabled at four events and engaged with over 230 students. While they reached fewer students through tabling, compared to class talks, they were able to engage in valuable dialogue with students through the process. The Sub-committee learned about barriers to taking part in the Minor, recommendations for improving the Minor, and how to best interact with and engage students going forward.
- Promoted the under-enrolled class, SUSTAIN 2S03, through gathering and sharing past student testimonials online and through social media. Through this campaign alone, over 26,000 people interacted with the content, and there was an 87% increase in enrollment in SUSTAIN 2S03 within a two-month period. This initiative not only increased enrollment in one of the Minor's now most popular courses, but it also increased the ASP Office's social media following.
- Engaged over 100 students in a herb-planting event, which was one of the most interactive initiatives that the Sub-committee ran this year. The week-long event was led by the MSU Sustainability Committee, and the Minor Student Sub-committee supported the event by co-hosting a one-day activity whereby students could plant their own herbs using upcycled coffee cups and containers, and soil amended with compost created from McMaster food scraps. To further promote the Minor, the Sub-committee ran a contest whereby students could win prizes by taking a quiz developed jointly by the SUSTAIN professors. Clues were provided through social media, which also encouraged students to follow and engage online.

Looking Forward: Goals for the Future

The Student Sub-committee recommended one main goal to work towards in the 2019-2020 academic year, which is to diversify the Sub-committee's representation to include at least one student member from each Faculty and the Arts & Science program. One of the strengths of the Minor is that it is interdisciplinary, and the Sub-committee should represent the community that it aims to serve. The success achieved in this first year of the Student Sub-committee has exceeded expectations and laid the foundation to further increase awareness of the Interdisciplinary Minor in Sustainability and build a greater community amongst sustainability students at McMaster.

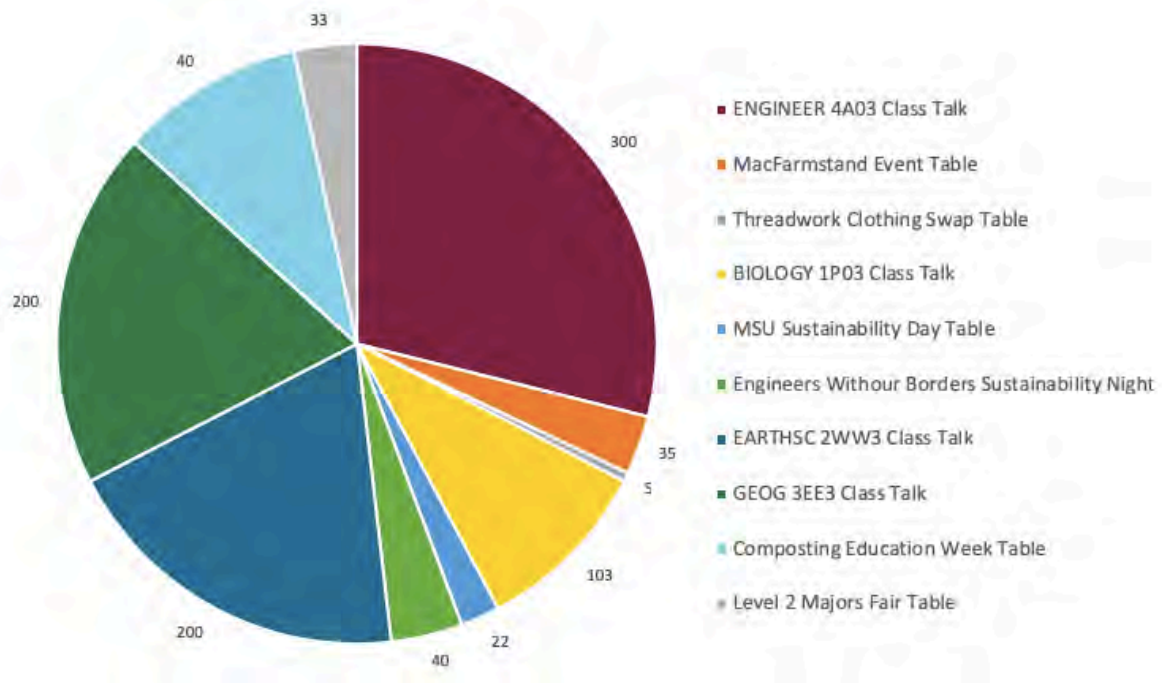


Figure 1: Student connections made at events led or co-hosted by the Minor Student Sub-committee between September 2018 and April 2019

Collaborators

This was a year of overcoming challenges, discovery, growth, and would not be possible without the dedication and passion from our Student Sub-committee members, Andrés Nagy Ossa, Faculty of Science; Gloria Ko, Faculty of Science; Reta Meng, Faculty of Science; Shaila Jamal, Faculty of Social Sciences (PhD); Shunmathi Shanmugam, Arts & Science; and Tanzim Hoque, Faculty of Science. The members of the Sub-committee played an integral role in leading and co-authoring this report. We would like to thank the Interdisciplinary Minor in Sustainability Committee, the Office of Sustainability, Emily Cornelius from the Biology Greenhouse for donating the plants, and the MSU for their support and guidance. We would also like to thank the following individuals who allowed the Sub-committee members to participate in their events and perform class talks; Luc Bernier, Zobia Jawed, Erin Leonard, and Elizabeth Way.

SUSTAINABLE FUTURE PROGRAM



Sustainable Future Program

The Sustainable Future Program consists of a suite of undergraduate courses focused on providing students with opportunities for interdisciplinary, student-led, community-based, and experiential education about sustainability. Courses in the Program are open to students from all Faculties. McMaster developed the Sustainable Future Program for students interested in learning about sustainability while having the opportunity to tackle complex sustainability challenges through real-world experiential learning. The Sustainable Future Program aims to build reciprocal relationships between students, community members, and McMaster University to engage all parties in the journey towards a sustainable future.

Objectives

- Teach students about sustainability from an interdisciplinary perspective
- Provide opportunities for self-directed, interdisciplinary, and experiential learning
- Support student learning within the University and local community
- Engage undergraduate students in taking part in meaningful, experiential research
- Foster opportunities for students to place local knowledge and local action within a global context

Reporting

Since launching the first course in the Winter of 2013, which had an enrolment of 97 students, the Sustainable Future Program has grown to include five courses and has supported over 550 students in the 2018/19 academic year. The Program continues to grow each year, and enrolment is anticipated to exceed 750 students in 2019/2020.

Collaborators

We would like to thank the faculty members, course teaching assistants, and community members for supporting students enrolled in the SUSTAIN courses, as well as for supporting continuous course and program development. Our sincerest appreciation extends to the hundreds of students who have contributed by taking courses and providing feedback for continuous improvement. We would also like to extend a special thanks to the Faculty of Engineering and the Engineering & Society Program for providing administrative support for the Sustainable Future Program.

Sustainable Future Program:

Year in Review

Since the first course was offered in 2013, the Sustainable Future Program has grown each year through the expansion and enhancement of existing courses and the addition of new courses. To achieve our overarching mission to inspire in *all* students a desire for continued learning through experiences in our programs, we continuously strive for growth and expansion, especially in our undergraduate SUSTAIN courses.

2018/2019 Objectives

- Assess demand for each course in the Program and proceed with expansion based on findings
- Implement and assess the outcomes of previous expansion efforts
- Assess the Program for the addition of prerequisite courses and proceed with actions based on findings

Reporting

Through actively monitoring enrolment in each course to ensure supply meets student demand, it was recognized that enrollment capacity of both SUSTAIN 1S03 and 2S03 should be increased. As such, capacity of SUSTAIN 1S03 was increased from 160 to 190 students in each semester. Enrolment capacity was also increased in SUSTAIN 2S03 from 140 to 160 students in each semester.

In September of 2018, we piloted the addition of course prerequisites that would require students to have a foundation of theoretical knowledge and experience with unique course components such as community-based learning, interdisciplinary group work, project management, and reflection, which would enable instructors to facilitate learning at a higher level. However, we found that students saw the additional prerequisites as deterrents to enrollment, even though they had the appropriate skills and abilities. As such, the prerequisites were removed to maintain and foster engagement in our courses.

In addition to enhancing current courses, we also worked to develop a new course to enhance the overall Program and student experience. To support the administrative transition of the citizen-led *100in1Day Hamilton* festival, we were presented with an opportunity to contribute by developing a new course. This course would explore the cultural and societal aspects of 100in1Day while also providing opportunities for student experiential learning through active participation in the festival. The resulting course, SUSTAIN 3SS3 – *Fostering Sustainable Communities through 100in1Day Hamilton*, is offered in the Summer semester during May and June. The addition of this summer course improved flexibility for students wanting to take a SUSTAIN course and further helped us to meet student demand for courses in our program.

Reporting (Continued)

Although enrollment for SUSTAIN 3S03 and 4S06 were lower than expected, due to the addition of course prerequisites, students of SUSTAIN 3S03, 3SS3, and 4S06 produced a total of 23 projects that contributed to sustainability on campus or in the community. Combined, these students also collaborated with nearly 500 individuals to learn about sustainability through leadership and action. Each project from SUSTAIN 3S03 and 4S06, along with a sample from SUSTAIN 3SS3, is reported on in the pages to follow.

Collaborators

Our sincerest thanks goes to all of the SUSTAIN students who engaged in learning and offered us their insight and feedback.

We would like to thank the City of Hamilton, Green Venture, McMaster's Office of Community Engagement, and the rest of the 100in1Day Hamilton organizing team for their support for our new course and our students' experiential learning.

We would also like to thank all of the staff and community members who supported our students' experiential learning in various SUSTAIN courses. Our partners at CityLAB were integral to the success of both SUSTAIN 4S06 projects. Specific individuals who supported our students' experiential learning projects are highlighted in the pages to follow. The faculty and staff members who helped to identify, provide, and act as resources to support students in applying their knowledge in novel and real-world settings have been instrumental in enabling us to achieve the diverse learning objectives of our courses.



Reducing Food Packaging Waste at McMaster

Student Authors

Stefania Abbatangelo, Engineering

Natalie Ciancone, Engineering

Community Project Champion

Chris Roberts, Hospitality Services

Overview

Food packaging involves the use of many non-recyclable materials that end up as waste and contribute to the increase of greenhouse emissions. In McMaster's most recent Waste Reduction Plan, the University puts a focus on "The 3 Rs", Reduce, Reuse, and Recycle in their newest initiative. This involves positioning waste bins in sets of three; waste, recycling and compost, in addition to increasing the number of compost bins.¹ The intent is to reduce the number of recyclable products that end up in campus waste bins. One prominent issue that was

Objectives

1. Understand food policies in the City of Hamilton
2. Gauge interest in a reusable container program at McMaster
3. Reduce food packaging waste generated from campus eateries through staff and student engagement and participation

Reporting

Initially, we had to understand the feasibility of implementing a reusable container program in regards to health and safety guidelines. To address this, we researched existing health policies in both Ontario and Hamilton, and realized that our program idea was possible if certain criteria were followed. We met with a Hamilton Public Health Inspector to gain a thorough understanding of these policies and discuss food handling methods that would adhere to regulations. With our new understanding of the barriers and opportunities for our project, we ran an online survey to gauge student and staff interest for a Bring Your Own Container (BYOC) program at campus eateries. We obtained responses from 280 people, a mix between staff, faculty, and students. We found that 90% of respondents were most enticed to use the program because it allowed them to reduce food packaging waste.

We began the implementation process for the BYOC program with a three-week pilot period at Creation X in the McMaster eatery, La Piazza. Prior to the program launch, we began advertising through posters, social media promotions, photos, and a video interview. Furthermore, Hospitality employees were informed and trained on how to carry out the program within health and safety guidelines. During the three-week pilot, we saw participation from less than a quarter of the number of people who had initially expressed interest. The success of this project was being able to provide customers with another option when purchasing food on campus. With continued support and marketing of the initiative, we hope to see participation increase, making bringing your own container a social norm. We look forward to working towards the permanent implementation of the Bring Your Own Container Program and hope to expand the reach of the program to other eateries at McMaster.

Collaborators

We would like to thank our Community Project Champion, Chris Roberts, Director of Hospitality Services, for his mentorship and support throughout the duration of the project. We would also like to thank Public Health Inspector, Nicole Ferrer-Whitehouse, for taking the time to meet and share her knowledge and suggestions. We are also thankful for the support from Abbie Little and Kate Whalen, from the Academic Sustainability Programs Office; Ciara McCann, Social Media & Digital Content Coordinator; and Geoff Shaw, MES Photographer. Lastly, we would like to thank the Hospitality Services employees for helping to carry out the project as well as students, staff, and faculty of McMaster University for their participation, interest, and enthusiasm.



BYOC program at Creation X
Photo credit: Geoff Shaw

not yet addressed is the reduction of the amount of waste created from campus eateries themselves. The goal of our project was to research and implement a waste-free alternative to current food packaging within McMaster's busiest on-campus eatery. By allowing customers to bring their own reusable containers, the hope is that the amount of food that gets packaged, and the volume of waste being disposed of at McMaster, will be considerably less than it is today.



Upcycling Jute Coffee Sacks with Detour Coffee Roasters: Reusable Bags

Student Authors

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Brandon Lebel, Engineering

Gurinder Sandhu, Science

Community Project Champion

Alex Yurek, Detour Coffee

Overview

Detour Coffee Roasters is the third largest specialty coffee roaster in Canada. Distributing to cafés across Canada, Detour imports 40-50% of its raw coffee beans in jute sacks each month, resulting in 12,000 pounds of jute waste annually.¹ When accounting for total national imports, Canada receives 3.1 million jute coffee sacks each year, totalling 1 million pounds of waste and representing an area of concern with the environment.² The cities of Hamilton and Burlington lack the infrastructure to

Market bag created from jute coffee sack
Photo credit: Gurinder Sandhu

adequately recycle or compost jute material, thus reuse is the most promising sustainable solution.³

Upcycling is a process of reuse in which a waste material is used to create a product of greater value.⁴ While jute is ideal for upcycling, the market for upcycled jute products remains untapped. As such, the goal of our project was to create a unique consumer product through upcycling jute coffee sacks.

Objectives

1. Create a product design that minimizes waste during manufacturing
2. Produce product prototypes to test the design and manufacturing process
3. Conduct market research to guide future iterations
4. Establish long-term sustainability of the product's production

Reporting

After consulting with our project champion, Alex Yurek, and our classmates, we decided to develop a market bag as our upcycled consumer product. While functionality and strength were two important aspects in our design, our main objective was to minimize waste. Thus, we created two prototypes that were not only strong but also utilized over 95% of the jute sack.

To test our prototypes, we engaged five friends to substitute their everyday bag with our prototype, and give us feedback on what they liked and what we could improve on. Our bags survived the strength test and we received constructive feedback to enhance the aesthetics, specifically related to the fabric lining. We refined the design by concealing the liner and choosing gender-neutral fabrics.

To begin our market research, we conducted a survey to understand which aspects of the product resonated with consumers most. Functionality was the most important aspect and, promisingly, prototype testers rated both product iterations most highly in this category. To further our market research, with Alex's help, we connected with five cafés across Canada to get our product to potential customers. The smaller of the two designs was chosen for distribution due to its aesthetics, size, and likeliness to buy, as rated by survey participants. We disseminated a survey to café owners to collect feedback relating to suggested retail price, popularity amongst staff and customers, and the opportunity to incorporate the bag as part of a gift package.

Finally, to ensure the long-term sustainability of our product, we will be collaborating with GTJ Coffee Sleeves (p. 16) and applying to The Forge, a start-up incubator, to continue developing the product and a business.* With these next steps, we hope we can continue this work of keeping waste from the landfill and creating unique consumer products in the process.

Collaborators

We would like to extend our sincerest thanks to our collaborators: Alex Yurek, our Community Project Champion and President of Detour Coffee Roasters; Kate Whalen, our mentor and Senior Manager of McMaster's Academic Sustainability Programs Office; Mohammad Abdul Aziz and Camilla Gillis-Adelman, our academic supports and course Teaching Assistants; Dr. Lefevre-Schlick Florent, Vignesh Rameshkumar, and Truc Ung, our manufacturing experts and project collaborators from McMaster's W Booth School of Engineering Practice and Technology, Faculty of Engineering; and Erin Mallon, Stewardship Technician, Cootes to Escarpment EcoPark System.

*Student authors listed on p. 15 and p.16 will be pursuing incorporation. Those individuals listed with the Collaborators section have provided support but are not pursuing incorporation.



Upcycling Jute Coffee Sacks with Detour Coffee Roasters: GTJ Coffee Sleeves

Student Authors

Josephine Agueci, Science

Gabrielle Gonsalves, Science

Taddeo Moretti, Arts & Science

Community Project Champion

Alex Yurek, Detour Coffee

Overview

Approximately 3.1 million bags of coffee were imported into Canada in 2018, and this number is expected to rise as the demand for coffee increases.¹ Coffee beans are shipped in large bags made from jute, a plant-based fibre that is strong, insulating, and one of the most widely used natural fibres for textile applications.³ Detour Coffee Roasters, the third largest specialty roaster in Canada, receives over 100 bags of coffee

GTJ Coffee Sleeve bundles

Photo credit: Taddeo Moretti

beans from around the world weekly, yet they are all sent to the landfill because they cannot be composted or recycled in local facilities.^{3,4} Given the valuable properties of jute and the significant amount that is going to landfill locally, the goal of our project was to “upcycle” Detour’s jute sacks into a product that is socially, environmentally, and economically sustainable as well as beautiful, functional, and thought-provoking.

Objectives

1. Design and create a product that would appeal to Detour and its growing customer base
2. Conduct a market analysis to refine and enhance our product design
3. Ensure long-term sustainability of the project and the relationships that have been formed

Reporting

Following consultation with our Project Champion, who is also the President of Detour, we identified an appealing product and created five different designs for reusable coffee sleeves. With each design holding much promise, we amalgamated them into three final prototypes. We then contacted 12 coffee connoisseurs who varied in age, gender, activity level, socioeconomic status, and environmental consciousness to test our prototypes. Using feedback from our testers, we decided upon one final sleeve design, which features an exterior pocket, a keychain loop, various patterned fabric linings, and the ability to be rolled up and secured by button for compact storage. We produced 25 of these designs and sent them to five cafés across Canada to obtain feedback on pricing, marketing, and willingness to carry our product going forward.

To ensure the long-term sustainability of our project, we contacted thrift stores who were more than happy to provide us with a sustainable source of fabric and buttons, which were otherwise destined for landfill. With help from students enrolled in the manufacturing stream of the W Booth School of Engineering Practice and Technology, we created an efficient and attainable plan for upscaling the production of our product. In considering other applications, we connected with Conservation Halton to test and explore the effectiveness of jute as a more environmentally-friendly, cost effective option for erosion control and other conservation applications. Following the culmination of this project, our team is planning to combine with the other Upcycling Jute Coffee Bags group (see p.15) to create one business* centred around creating a positive and sustainable difference in our community. With plans to collaborate with The Forge for support, resources, and workspace, the future is brighter than ever for GTJ Coffee Sleeves.

Collaborators

We would like to extend sincere thanks to President of Detour Coffee Roasters, Alex Yurek. We are beyond grateful for all of his support, mentorship, and business advice. We would also like to thank Josephine’s grandmother, Pina Agueci, as well as Kate Whalen from McMaster’s Academic Sustainability Programs Office, for providing guidance instrumental to our group’s success. Our project would not have been possible without their constant feedback and their invaluable sewing and business knowledge. We would also like to extend our gratitude to Daniel Park from The Forge for his support in business, and the W Booth School of Engineering Practice and Technology at McMaster University, Faculty of Engineering, for their manufacturing expertise. Last but not least, we would like to thank all of the individuals who took the time to provide feedback and support for our project.



Final coffee sleeve design components

Photo credit: Gabrielle Gonsalves

*Student authors listed on p.15 and p.16 will be pursuing incorporation. Those individuals listed with the Collaborators section have provided support but are not pursuing incorporation.

Waste-Free Champions: Essential Utensils Kit

Student Authors

Sabrina Dasouki, Science

Billy Olds, Science

Kristal Ramnarine, Commerce

Community Project Champions

Craig MacDonald, Facility Services

Adam Chiaravalle, Sustainable Food Systems Advocate



The Essential Utensils Kit

Photo credit: Sabrina Dasouki

Overview

Accumulation of plastics and organic waste in landfills is a major issue in North America. Only 10% of all plastic waste in Canada is properly recycled, with approximately 90% of plastics going to landfills, lakes, parks, or oceans.¹ McMaster University produces 1,183 metric tonnes of organic waste annually, where more than 30% could be composted and another 54% could be recycled.²

Convenient access to single-use plastic utensils on campus encourages wasteful habits. Also, the lack of awareness about compost bin locations results in potentially compostable items being placed in the garbage bins. Our goal was to create a waste reduction kit that supports waste-free practices and composting on campus.

Objectives

1. Create a prototype kit with a variety of reusable components, ensuring it is compact and easily accessible for users
2. Gather feedback from students and faculty to enhance the design, aesthetics, and willingness to use and purchase the product
3. Present a business case to industry leaders at McMaster, gathering suggestions to further improve our product for sale

Reporting

To begin our product, we produced our first waste-free kit as a prototype, which included a reusable straw, straw cleaner, three organic bamboo utensils, reusable snack bag, a reusable napkin, beeswax food wrap, and a pocket-sized card that lists compost bin locations on campus. From students and staff members, we gathered feedback through a survey about the current design, aesthetics, and degree of usefulness of each item. The prototype was revised accordingly to enhance the willingness to use and purchase our product. Once we created the second iteration of our prototype, we then presented our business case to members of the McMaster and broader Hamilton community at our course symposium. To continue our project, we will be applying for The Forge Start-Up Competition in January 2019, as well as approaching students of Enactus to discuss the potential to work with them on this initiative. An unexpected achievement is that we successfully sold three prototypes while conducting our survey sessions and received two requests for purchase. This gives us confidence that we have created a useful and marketable product that has the potential to reduce waste and increase composting, both at McMaster and beyond.

Collaborators

Sincerest thanks to our Community Project Champions Craig MacDonald, Executive Director of Facility Services, and Adam Chiaravalle, for their tremendous leadership and guidance throughout this project. Thank you to Josephine Agueci of Upcycling Jute Coffee Sacks with Detour Coffee Roasters (p.16) for her help with creating felt casings for our final prototypes. We would also like to thank Kate Whalen for providing inspiration and support with our prototype design. Last, but certainly not least, we would like to thank all of those who completed our survey and provided us with feedback to enhance our product design.



Trees for Hamilton

Student Authors

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Community Project Champions

Wayne Terryberry, Natural Lands & Outdoor Recreation

Abbie Little, Academic Sustainability Programs



Student volunteers participating in a guided tour of Eramosa Karst
Photo credit: Eric Howarth

Overview

Trees are essential for life on earth. In addition to absorbing CO₂ from the atmosphere and providing us with oxygen to breathe, trees also support wildlife and maintain balance within the ecosystem.¹ However, through human activity, the number of trees in our environment is declining at an alarming rate, and humans do not seem to realize their direct impact.² Research has shown that engaging young people in environmental conservation efforts, including tree planting, can help develop positive attitudes towards and value for the natural environment.³ The

goal of this project was to provide an opportunity for youth to engage with local conservation groups to have a positive environmental impact through planting trees and learning more about the ecosystems around us. By providing volunteers with a rewarding and educational experience, we motivated individuals to make sustainable decisions in their everyday lives and continue making a difference in their communities even after the event had finished.

Objectives

1. Engage Hamilton youth and conservation groups in a joint tree planting event
2. Educate students on the importance of trees, biodiversity, and environmental health
3. Support continuity of future tree planting events through the creation of a transition toolkit

Reporting

Through collaboration with Trees for Hamilton, a local non-profit organization, the Hamilton Conservation Authority, McMaster University, and Bishop Ryan Catholic Secondary School (CSS), we organized an educational tree-planting event at Eramosa Karst on October 13th, 2018. Prior to the event, we attended an EcoTeam meeting at Bishop Ryan. This involved holding an information session on the importance of trees and their impact on the environment, as well as encouraging the students to participate in our upcoming tree-planting event. On the day of the event, over 45 volunteers from McMaster and Bishop Ryan were in attendance. These volunteers learned how to properly plant trees and contributed to planting over 500 in total. After the planting session, we led volunteers on a tour of the Karst followed by a pizza lunch. By collecting information from volunteers throughout the day we were able to receive feedback through a post-event survey, with one-third of volunteers participating in this survey. When asked about their favourite part of the event, respondents said they enjoyed planting trees (10) and the hike of the Karst (5). Furthermore, 100% of respondents expressed that they would recommend this event to friends, which demonstrates the value of continuing this event in future years. We have created a transition toolkit to help support those who will take on the organization of this event in the future. The toolkit includes a how-to video for tree-planting, a list of important contacts, a proposed timeline, lessons learned, and additional recommendations. To help assist with the financial challenges we faced, such as funding transportation and food, we have applied for a \$500 grant from the World Wildlife Fund. If successful, future organizers will have these funds in combination with the toolkit to organize and further enhance the next tree-planting event.

Collaborators

We would like to thank our Community Project Champions, Abbie Little and Wayne Terryberry from McMaster University, and Myles Sergeant from Trees for Hamilton, for their guidance and support throughout the entirety of the project. We would also like to thank Miss Kathy Zadovny and the BRIGTH EcoTeam from Bishop Ryan CSS, and McMaster students from DeGroot Green for their integral support during the tree-planting event. Last but not least, we would like to thank every volunteer that came out to this event as it would not have been possible without them!



Catering Sustainable Events at McMaster

Student Authors

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Community Project Champion

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Catering event based entirely on a plant-based menu
Photo credit: Geoff Shaw

Overview

McMaster's Catering Services (MCS) has already implemented several sustainable measures, from sourcing healthy and allergen-free food, to only using recycled paper products. They are now looking to put even more sustainable practices into action. One significant opportunity is to provide more plant-based options. As demonstrated in the academic literature, plant-based

diets require less land, energy, and water to provide the same number of calories as meat-based alternatives.^{1,2,3,4} As such, our aim was to work with MCS to identify opportunities for them to provide their clients with more sustainable options for catered events, with a focus on providing more plant-based options.

Objectives

1. Educate about sustainable options available through MCS
2. Create opportunities for MCS customers to action sustainable change through catered meetings
3. Pilot at least one sustainable catering initiative, report on the results, and recommend next steps

Reporting

Our first objective of educating the public on sustainable options available for them during catered events, was achieved by restructuring the current student catering menu with more plant-based alternatives, as well as making these options more accessible and apparent to MCS customers. We were fortunate in the fact that we were able to work on two catered events where our new student catering menu was utilized. During our first piloted event, we learned that while the direct customers (the event organizers) were aware of the plant-based options on the menu, those who attend the catered events did not necessarily have the same information. Consequently, we obtained an ingredient list of each item on the menu, which was also made available online. We took this opportunity to create a template for small A-frame menu cards that event organizers could print and display by each catered item at their event. During the second event, we piloted both the menu and the A-frame ingredient cards. We found that an additional, and unintended benefit is that event organizers and attendees could more easily identify plant-based options and food allergens, further supporting the health, well-being, and experience for all. The updated menu, ingredient card template, and ingredient list will be posted on MCS website by January 2019.

Collaborators

A special thanks to our Community Project Champion, Catherine Young, the Senior Manager of Administration and Catering for McMaster Hospitality Services, for guiding our project and connecting us with other collaborators. Thanks to Paul Hoag, Executive Chef, and Liana Bontempo, Dietitian and Wellness Manager for help in refining the plant-based menu items. Thanks to Engineers Without Borders and the Academic Sustainability Programs Office for all of the feedback and the opportunity to have been able to offer our plant-based menu for Sustainability Night and the Course Symposium, respectively.

Students Supporting Students Through the Gig Economy

Student Authors

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Community Project Champions

Chris McIntosh, Gigit

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Overview

In our modern world, technology facilitates the online transaction of goods and services. Currently at McMaster University, there is the potential to use technology to bridge the gap between services that students need and services that students can provide, in both a paid and volunteer basis. As such, the goals of our project were to identify how students can support each other

Objectives

1. Identify the supply of and demand for knowledge, skills, and abilities from within the McMaster student body
2. Summarize our findings on how students can best support each other through the use of the gig economy and technology
3. Share our findings and recommendations with members of the McMaster and Gigit communities

Reporting

To identify the supply and demand for services at McMaster, in a volunteer or paid capacity, we ran an online survey and a surveying table in the Student Centre, allowing us to engage with over 110 students. We asked participants what services they need, what services they could offer to other students, and if they would use an app or online platform to find and offer services within the McMaster student community.

Summarizing our findings, we found that 61% of students reported a need for tutoring services, with 75% saying this was a service they could provide. Comparably, peer-editing was needed (50%) and could be provided (50%). These findings are not necessarily surprising, considering our study population consists mainly of full-time university students. What is surprising is that with all of the social networks and services available to them, students want additional support. Dissimilar from the first two, the third top service was “random errand/taskmaster.” There was significant demand (42%) and supply (42%) identified by participants, suggesting that students can use assistance when life gets busy but could also see this as a way to earn some additional income; students are receptive to flexible and ambiguous jobs. Lastly, there was a strong demand and supply for creative jobs. The interest in music (24%), graphic design (18%), and photography/videography (20%) indicates that there is likely an idling capacity of creative hobbies that students can address through the coordination of skills. Other popular services included: life mentor, career advisor, chef, and language instructor. When asked, 74% of respondents said they would use a McMaster-centred platform that consolidates these services (24% were unsure; 2% would not). The strong student support is encouraging and we are happy to share our findings and recommendations to leverage technology to help students support students at McMaster.

Collaborators

We would like to thank the team at Gigit: Christopher McIntosh, President of Gigit and our community project champion, Christian Paetkau and Mil Kovacevich for supporting us through our project and for teaching us about their work in supporting and fostering the gig economy. We would also like to thank all of the students who engaged with us through our survey and conversations on campus, and our sustainability mentors who helped guide our project.



Students participating in the gig economy: a tutoring session, photoshoot, and coffee run
Photo credit: Shannon Wu

and how technology could help connect them. Our research serves as a link between student needs and technological resources, since our results informed Gigit, a local tech company that facilitates online networks for gigs, about how the platform can find a sustainable, supportive function within student life.



Towards a Sustainable Campus: Green Room Certification (GRC) in Residence

Student Authors

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Community Project Champion

Monica Polkowski, Residence Life



GRC sticker certified residences receive
Photo credit: Monica Palkowski

Overview

Trends show that McMaster students are creating waste where there could have been none. The 2016 McMaster Sustainability Annual Report found that waste diversion rates had improved by 20% in two years.¹ Literature suggests that the approach to rearing “green” habits amongst collegiates should emphasize active participation and awareness promotion.² This project aims to bring the Green Room Certification (GRC) program into residence, specifically targeting students in the Outdoor Leadership Living Learning Community. Through this project, students receive GRC by meeting specific criteria on the GRC checklist, which has been adapted from other schools who have

already implemented the GRC program.^{3,4} Each item on the checklist describes an action/habit that promotes sustainable living (e.g. I do not open my windows when the air conditioner or heater is running). This workshop and events-based initiative strives to help students maintain a socially sustainable campus and empower them to continue to build on their knowledge after program completion. The goals of our project were to implement the GRC program, educate students about their impact on the world around them, and provide them with the tools to adopt sustainable lifestyles both during and after program completion.

Objectives

1. Develop and facilitate practical events focused on the needs of students
2. Provide students with knowledge to maintain sustainable living habits after they have left residence
3. Certify the rooms of students in accordance with the GRC checklist

Reporting

Our group worked with the Mother Nature’s Minions in Residence (p.22) to complete the GRC Launch Event, where we gathered information about students’ current knowledge about living sustainably, perceptions about McMaster’s role in creating sustainable initiatives, and what they wanted to see out of our project’s events. We expected an attendance of 20 students and received four attendees. Following this, we made improvements to increase engagement. Our next event was a “Scary Movie Night” where we decorated mini compost bins, and our attendance doubled to eight students. At our third workshop, “Trivia and Treat”, which featured sustainability-based trivia with rewards of candy, our attendance doubled again to 16. Our last event, in collaboration with the Mother Nature’s Minions in Residence, was a “Clean & Green” workshop where students made their own cleaning supplies using minimal and natural, non-toxic ingredients. This success of this event exceeded our expectations and brought in 20 students. After the completion of our workshop series, we asked students to fill out the GRC checklist we created at the beginning of our project. In total, 36 students were certified. From their responses, we were able to identify further gaps - for instance, less than 70% of respondents reported regularly composting - that could potentially be targets for future program implementations. The program was wrapped up with an online info-sheet containing tips for sustainable off-campus living and a prize giveaway.

Collaborators

We would like to give special thanks to our Community Project Champions, Monica Palkowski and Abbie Little, along with Liana Bontempo who supported our work. Furthermore, we would like to thank all of the students for coming to our events and being engaged in our project. We would also like to thank the Sustainability 3S03 instructional team for their constant support and providing us with the opportunity to implement a sustainable change on our campus.



Mother Nature’s Minions in Residence

Student Authors

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Community Project Champion

Monica Polkowski, Residence Life



Students learning how to make green cleaning supplies
Photo credit: Abbie Little

Overview

For most students, going to university is often their first time living independently.¹ This makes it vital to help the students grow their own sustainable habits through education and showcasing methods of sustainable living before other habits form.² The goal for this project was to instill sustainable food, transportation, and cleaning habits in residence students enrolled

in the Green Room Certification (GRC) program, a program that provides opportunities for students to learn how to decrease their impact on the environment while in residence. By doing so, we wish to have an ongoing GRC program for future years’ residents, enabling students to become sustainable ambassadors and role models for sustainable living amongst their peers.

Objectives

1. Engage residence students in experiencing sustainable food options on campus
2. Create an opportunity for students to explore and use various transportation systems in Hamilton
3. Provide students with the tools and knowledge to be able to live sustainable lives



Exploring Hamilton’s picturesque landscape on a hike to Sassafras point.
Photo credit: Alexander Mo

Reporting

During October and November, we hosted three sustainable living events as part of the GRC program, which included: a sustainable food tour, a hike to Sassafras Point and bus ride back to campus, and a workshop on creating sustainable cleaning supplies. Students joined us to tour three restaurants on campus to learn about sustainable eating habits, meet the chefs in charge, and also try some samples. Of the attendees, less than half had previously visited one of the sustainable eateries, but all attendees said that they would go back to at least one of them. We had eight students join our hike to learn about Sobi and ride the HSR. One student said, “this is my first time using the buses in Hamilton,” demonstrating the impact of our event. Students learned about the impacts of harmful chemicals and how to make green cleaning supplies. One student said, “if you can put them in your body, the ingredients are safe to use and safe for the environment.” All of the students said they will continue to make and use these products and would recommend the workshop to friends.

Collaborators

We would like to give special thanks to our Community Project Champion, Monica Palkowski, and to Abbie Little and Liana Bontempo, for supporting our work. Furthermore, we would like to thank all of the students for coming to our events and being engaged in our project. We would also like to thank the Sustainability 3S03 instructional team for their constant support and providing us with the opportunity to implement a sustainable change on our campus.



NoLunchMoney: Enhancing Student Engagement and Participation

Student Authors

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Community Project Champions

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Collage of social media posts promoting various McMaster club events through NoLunchMoney
 Photo credit: Shirin Talebi, Dominika Piskorz, and NoLunchMoney

Overview

The current amount of food waste on McMaster campus makes distributing the leftovers within our community a beneficial movement. NoLunchMoney is a student-led initiative that aims to rescue high-quality food that would otherwise go to waste, by giving it to students. The primary goal of NoLunchMoney is food security and food accessibility for all students on campus - this is done through event promotions and letting students know of free

food sources on campus whenever available. However, there have been challenges in carrying this initiative out to the student body of McMaster University. The goals of our project were to establish sustainable connections with McMaster student clubs that host free-food events and to raise awareness regarding their constructive and positive purposes.

Objectives

1. Increase awareness of and engagement with NLM, specifically by student clubs
2. Understand current levels of awareness and engagement with NLM
3. Create a report of findings, outcomes, and recommended next steps to enhance the impact of NLM at McMaster

Reporting

We started our project by increasing awareness of and engagement with NLM. Our team launched an online survey to measure students' interests in attending free food events. We were successful in contacting 150 clubs and managed to establish sustainable connections with 35% of them. To address the response from our survey, we identified two approaches that were most effective for MSU clubs to partner up with NoLunchMoney organization. One approach consists of clubs contacting NoLunchMoney through their Facebook page and informing them of upcoming events. The clubs provide a brief description of their event and food available. Then, NoLunchMoney promotes their event via social media to increase attendance and reduce food waste. The second approach is for the event coordinators. For the second approach, an NLM team member typically picks up the food and brings it to a central hub, such as the Student Center or a library. To conclude our project we consolidated a report of our findings from the outcomes of engaging with student clubs and compiled a list of recommendations for next steps. Our primary proposal is for NLM to apply to become an official MSU club, which will address the three main barriers that we identified through our work: secure locations, consistent funding, and official reputation on campus.

Collaborators

Our group collaborated with a diverse range of people in the following order. We start by establishing personal relations with MSU clubs to inform them about the initiative and how it works. We introduced them to NoLunchMoney's contact system and the method of operation to create a working relationship between the clubs and NoLunchMoney. We gathered information from clubs on whether they hold free food events, if they are aware of this initiative and if they are interested in participating.

Hungry for Knowledge: Student Food Insecurity at McMaster University

Student Authors

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Community Project Champions

Merryn Maynard, Meal Exchange

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Overview

Meal Exchange is a nonprofit organization that tackles issues such as student food insecurity in Canadian post-secondary institutions. Food insecurity is understood as the limited or inadequate access to food due to insufficient finances. In 2016, Meal Exchange worked with five university campuses (Brock, Calgary, Dalhousie, Lakehead, Ryerson) to survey students using the Hungry for Knowledge survey guide and framework. Among the campuses, they found that 39% of all students experienced some degree of food insecurity.¹

Objectives

1. Determine a prevalence estimate of students experiencing food insecurity
2. Identify key factors that contribute towards student food insecurity
3. Raise awareness about various services that address and help reduce the issue of student food insecurity

Reporting

Survey responses were obtained by advertising through social media, posters around campus, and class talks. 185 full responses were analyzed from the 204 that we received. Our findings indicate that 39% (71) of respondents have experienced moderate* food insecurity while 12% (22) experienced severe** food insecurity. The major contributing factors included costs of food (51%), limited time to prepare meals (43%), the lack of healthy and diverse food options on campus (40%), and inadequate financial support (29%). Students also reported that food insecurity impacted areas of life such as their physical (44%) and mental health (42%), along with their social life (27%) and their grades (23%). The most common experiences of food insecurity were relying on low-cost foods, not eating healthy balanced meals, and prioritizing other financial needs before securing adequate food. This resulted in skipping meals and sometimes not eating the entire day. Of those who identified as food insecure, only 24% utilized the programming and services at their disposal such as a food banks or hunger relief. These findings have been shared with established MSU student clubs and services to strategically use the results for enhancement of their services. Students who experience food insecurity can become informed of the various clubs and services at their disposal; through continuous promotions and advertising. The increased usage of these services and clubs can aid in the reduction of food insecurity at McMaster. Further exploration and follow-up are currently in progress as this study will be continued in 2019. These meaningful contributions are in support of Meal Exchange's development of a provincial strategy, to generate further dialogue and actions to address food insecurity, and to ultimately swing momentum towards the student food movement.

Collaborators

We would like to thank our two Community Project Champions for their guidance throughout the term: Merryn Maynard, Programs and Operations Co-ordinator of Meal Exchange, and Stephanie Bertolo, Vice President of Education at McMaster Students Union. In addition, we are grateful to Tina Moffat and Dianna Williams for helping to develop the survey and ethics application in advance of our project, as well as for their continuing work on this study. We appreciate the MSU clubs and services for their assistance in promoting our survey. Most importantly, we thank the students who dedicated their precious time to completing our survey.

* Significant food access issues, including income-related concerns and reduced quality and/or quantity

** Extreme food access issues, including income-related concerns and reduced quality and/or quantity



Foods that are stereotypically consumed when dealing with food insecurity
Photo credit: An'am Sherwani

An online survey was created for McMaster's student population for the purpose of evaluating the prevalence of student food insecurity and determining the groups most at risk. The survey also questioned about the various barriers and factors that influence and contribute to the emergence of student food insecurity. The goal of our project was to gain knowledge and understanding about the social issue of student food insecurity through survey data collection.

Junk Jam: Keeping Green Spaces Clean with Proper Waste Management Practices

Student Authors

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Junk Jam Intervention setup for 100in1Day Hamilton

Photo credit: Cameron Churchill

Overview

The City of Hamilton has an extensive network of parks and trails that are widely used by residents and visitors. However, these parks are often defaced with litter. Many people are either misinformed or unaware of the waste sorting systems used within their communities and many parks only contain standard garbage barrels for waste collection. Contaminated waste as well as improperly sorted recycled materials can be quite costly. Cities

like Toronto and Montreal have approximately 22% recycling contamination rates, the highest in Canada.¹ Researchers claim that a 1% decrease in contamination rates could save cities like Toronto \$600,000 to \$1,000,000 annually.¹ As such, the goal of our project was two-fold: 1) inform others on proper composting and recycling practices and 2) reduce the amount of littered waste in public parks.

Objectives

1. Educate Hamiltonians on proper waste disposal practices
2. Highlight the importance of proper waste management in public spaces
3. Evaluate the need for the City to include compost and recycling bins in public spaces

Reporting

Our 100in1Day urban intervention consisted of an educational waste sorting activity followed by a beach cleanup along the Waterfront Trail by Confederation Park. To start, participants completed a waste sorting challenge with the aid of informational graphics. Items were sorted into separate bins for waste, recycling, and compost. Upon successful completion of the activity, participants took a questionnaire which revealed that 99% supported having three-stream waste containers in parks. Furthermore, each participant stated that they had learnt something new through the activity with over 80% of responses relating to proper disposal procedures for different types of plastics. Using equipment from the City of Hamilton's Team Up To Clean Up program, beachgoers then collected waste along the shore and properly sorted it into streambed bins. In just 90 minutes, 35 participants collected five full bags of waste, with the vast majority being single-use plastics, such as bottle caps and straws. After completing the activities, attendees received a complimentary ice cream from Hutch's on the Beach as well as compost bags to take home. Throughout the entire event, local musician, Anthony Hunt, performed on piano to engage and entertain others. Despite the inclement weather, we engaged over 50 people at our intervention. Overall, our results were positive and displayed a need for improved waste sorting in public parks, as well as a need for improved signage by waste bins. Looking at opportunities to grow, we suggest that more research be done into environmental degradation and bioaccumulation of plastics as well as a stronger marketing presence promoting the event. Through more educational initiatives like ours and through the instalment of more streambed waste disposal units, we hope to see improved waste practices by Hamiltonians and less litter in our public parks.

Collaborators

We would first like to thank the City of Hamilton for providing us with the resources to run this event. We also send a sincere thank you to Hutch's on the Beach for the ice cream and the use of their outdoor space. A special thanks to our musician, Anthony Hunt, for his exceptional performance. In addition, we want to thank the course staff: Peter Topalovic, Cameron Churchill, and Gabrielle Gonzales, as well as our classmates for helping us to create and execute a successful urban intervention. Lastly, thank you to Abbie Little and Kate Whalen from the Academic Sustainability Programs Office and the 100in1Day team for their ongoing support throughout this process.

Hamilton Sustainable City Tour: Path Towards a Sustainable Future

Student Authors

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Morning bike tour from McMaster University
Photo credit: Abbie Little

Overview

As three Hamiltonians who love our city, we were inspired by the changing narrative that is being told about the ‘Steel City’. Recent articles are promoting Hamilton’s architecture, food scene, and environmental beauty, and we wanted to contribute to this story from our own perspectives.^{1,2}

Furthermore, we wanted to highlight the beauty of Hamilton in a way that was barrier-free, fun, and sustainable. Ultimately, our project goal was to celebrate Hamilton through engaging people in learning about and experiencing the city in a new way.

Objectives

1. Ensure enhanced accessibility
2. Create an interactive educational experience
3. Encourage the use of active travel

Reporting

Path Towards a Sustainable Future was our urban intervention that took place as part of 100in1Day Hamilton. Our intervention was an educational tour that celebrated five historically and sustainability significant aspects of the built and natural environment in Hamilton. To ensure enhanced accessibility, we also made our tour available via audiocast, which received 75 ‘views’ within one week following our intervention. To engage participants in an interactive and educational experience, we installed a temporary poster at the Bayfront Park location that asked, “what sustainable change would you like to see in Hamilton?” By the next morning, the poster was filled with over 40 responses in total. To encourage the use of active travel, we installed bi-directional wayfinding signs along the route, which included estimated walking and cycling times between each location. We also led five participants on a guided bike tour from McMaster to the Barton Village Festival. We concluded our project by sharing our information, resources, and findings with Sobi Hamilton and the City in hopes that this initiative will continue in the future.

Collaborators

We would like to thank Peter Topalovic, our course professor, as well as Abbie Little and Kate Whalen from the Academic Sustainability Programs Office, for their amazing support and ideas. We would also like to thank Gabrielle Gonsalves, our course TA, for her guidance and Danial Aminaei, Maral’s brother, for helping us connect with SoBi Hamilton and the City of Hamilton.

Identifying Barriers to Indigenous Inclusion within the Governance of Environmental Organizations in Hamilton

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Community Project Champions

Cindy Mutch, City of Hamilton

Nicole Jones, City of Hamilton



Project team members at CityLAB after final workshop event. From right: Nicole Jones, Cindy Mutch, Monica Sadik, Trey McLeod, Kate Whalen. Photo credit: Abbie Little

Overview

The City of Hamilton is situated upon the traditional territories of the Erie, Neutral, Huron-Wendat, Haudenosaunee and Mississaugas. This land is covered by the Dish With One Spoon Wampum Belt Covenant, which was an agreement between the Haudenosaunee and Anishinaabek to share and care for the resources around the Great Lakes. We further acknowledge that this land is covered by the Between the Lakes Purchase, 1792, between the Crown and the a of the Credit First Nation.

Today, the City of Hamilton is home to many Indigenous people from across Turtle Island (North America) and we recognize that we must do more to learn about the rich history of this land so that we can better understand our roles as residents, neighbours, partners and caretakers.¹

Objectives

1. Identify and understand the governance structures, practices, and processes of local environmental organizations
2. Identify existing environmental organizations, their partnerships with Indigenous communities, and barriers to inclusion
3. Share findings with members of the Indigenous community and representatives of environmental organizations within the Hamilton area

Reporting

To address our first two objectives, we interviewed a board member from seven environmental organizations operating within the Hamilton area. Our interviews explored their governance structures, diversity practices, Indigenous partnerships, and challenges to inclusion.

From our study, 42% of participants felt that they did not know who to contact within the Indigenous community, and 28% felt a general lack of resources to support respectful and appropriate engagement efforts. Additionally, 28% of participants felt a lack of education and awareness regarding the importance of Indigenous people's traditional knowledge and distinctive relationship to land. Of these responses, three main themes emerged: (1) awareness and education, (2) resources, and (3) relationship building.

To address these barriers, we hosted an event that brought together members of the Indigenous community and environmental organizations to share our findings, make connections, identify resources, and learn about Indigenous relationships to land. Following a presentation by traditional knowledge keepers, we shared our research findings, and then engaged in group discussions to identify actions to address the three identified barriers. This event was attended by 37 participants, composed of environmental organizations, public community members, and Indigenous community members. Participants worked together and came up with 19 actions related to the barriers identified. Contact information was encouraged to be exchanged at the event and our team distributed a list of contacts of officially recognized Indigenous organizations in Hamilton. Following the event, we shared our summary report with all participants as well as contact information for all local environmental and Indigenous organizations in the Hamilton area.

Collaborators

We would like to give a special thanks to our City of Hamilton project champions, Cindy Mutch, Senior Project Manager of Community Engagement, and Nicole Jones, Project Manager of Indigenous Initiatives, for their guidance and support. We would also like to thank Kate Whalen, SUSTAIN 4S06 Course Instructor, for her continued motivation and mentorship. Thanks to Abbie Little for all her support and help taking photos at our event. We sincerely thank the environmental organizations for their participation in our study and everyone who attended the Acknowledging the Land event.



Attitudes, Behaviours, and Strategies to Reducing Undergraduate Food Waste

Student Authors

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Community Project Champions

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Overview

Approximately \$49 billion dollars in food is wasted at the manufacturing and consumer levels each year in Canada.¹ This amounts to over 35 million tonnes of food, which also equates to 58% of all food produced in the country. The acts of throwing away food that is near or past the best-before date and purchasing too much food and throwing the surplus away, are two of the greatest sources of preventable food waste at the

Objectives

1. Identify the barriers to reducing food waste
2. Understand students' attitudes and behaviours related to food waste
3. Develop and implement a sustainable strategy to dismantle the identified barriers

Reporting

We surveyed 373 undergraduate students living in shared accommodations to understand their attitudes and behaviours regarding food waste. Initial survey results found that students have poor shopping and storage habits, such as shopping infrequently, forgetting about food, and/or purchasing too much food to eat before it spoils. We also identified students' main motivations to reducing food waste were environmental and financial factors.

Utilizing the results from our survey, we developed an educational pamphlet and a workshop to foster discussion and share best practices about shopping and food storage, which were framed using financial and environmental benefits as motivation. Feedback from the workshops confirmed the barriers identified in the survey responses. Students reported being more receptive to changing their behaviours once they were more aware of the financial and environmental impacts of food-waste. Workshop participants were very receptive of the information in the educational pamphlet and also shared some of their own tips, which included smart phone apps for grocery shopping and cooking collaborative meals with housemates when supplies are low. Following the workshop, students were encouraged to implement habits discussed relating to food shopping, food storage, and meal planning. Students were asked to complete a post-workshop questionnaire to assess if they had implemented any of the discussed best practices. Students self-reported an increase in positive habits relating to meal-planning, shopping, and food storage.

In order to have the results of our study continue to impact change amongst McMaster students, we ensured that the project reports, recommendations, and educational pamphlet were made available online and for use in future seminars and workshops provided by on-campus departments and the City of Hamilton.

Collaborators

This project would not have been possible without the guidance, support, and feedback from our Community Project Champions, Elizabeth Smith and Ruby Samra of the City of Hamilton's Public Health, Healthy and Safe Communities Department, as well as from our course Instructor, Kate Whalen. We would also like to thank the MSU Sponsorship and Donation Committee, the MSU Sustainability Committee, and the City of Hamilton for sponsoring this project. Additionally, we thank Taryn Aarsen for incorporating our project into the Food for Thought program, Abbie Little for her support in promoting our online survey, the McMaster Research Ethics Board for their on-going guidance, the instructors who shared our survey with their students, and all of the students who completed our survey and attended our workshops.



The Grocery Shopping Guideline that provides tips on how to reduce food waste
Photo credit: Josh Yachouh and Alexandrea Johnston

consumer level.¹ To compound this issue, studies of undergraduate populations demonstrate that students lack awareness of how their lifestyles impact waste management systems and the environment.² As such, the goal of our project was to identify and provide strategies for undergraduate students to reduce their production of food-waste within their student households.

Sustainability Internship Program



Sustainability Internship Program:

McMaster's Sustainability Internship Program was created in 2009 in collaboration with a group of highly engaged faculty members and their students. The program was developed with the purpose of enabling students to apply their theoretical knowledge of sustainability to address a real-world problem.

Objectives

- Support all Faculties in providing opportunities for undergraduate students to gain academic credit for experiential learning
- Foster collaboration between students, faculty, staff, and the broader community
- Highlight the achievements of students who have successfully completed their sustainability internship

Reporting

Through annual revision and enhancement, the Sustainability Internship Program has evolved over the past nine years and has supported more than 35 students in experiential learning at McMaster. Starting in 2013, all ASP Annual Reports include a full section highlighting the work of students who have successfully completed their Sustainability Internship.

Collaborators

The Sustainability Internship Program is made possible through collaboration with Faculties from across campus, and with support from faculty, staff, community members, and especially the students who devote their time and energy into self- directed, community-based, and experiential learning about sustainability.

Sustainability Internship Program:

Year in Review

During the initial offering of the Sustainability Internship Program, there were approximately eight to ten students taking part each year. However, with the development of the upper year SUSTAIN courses, which all include a community-based experiential learning project, we now see between two and five students taking part in the Internship Program each year. We still welcome and encourage students to pursue an internship through our department, but fewer students in the program is a positive shift because it suggests that the SUSTAIN courses are satisfying a latent demand for this type of learning on campus. While the SUSTAIN courses provide richer opportunities for interdisciplinary learning between student classmates, the Internship Program offers greater flexibility and the opportunity for more independent study and robust research. The goal in recent years is to support student-directed learning of various forms and also support students in gaining meaningful learning experiences that are unique to other courses and programs offered at McMaster.

2018/2019 Objectives

- Maintain flexibility in program structure to support student-directed learning
- Develop resources to support student-directed learning and inquiry
- Provide opportunities for mentorship throughout the students' learning process

Reporting

This past year, three students took part in the Sustainability Internship Program. Erin Varey focused her project on an investigation of how smart city solutions could improve transportation in Hamilton; Glenda Chiu aimed to better understand the health impacts of truck emissions on cyclists in downtown Hamilton; and Diana Williams investigated student experiences with food insecurity at McMaster University.

Collaborators

The individual student interns designed, developed, and created fantastic work through their self-directed learning. Integral support was provided by their respective academic departments, as well as the students' academic supervisors, community project champions, and project mentors, who are each mentioned in the pages to follow.

The Role of Truck Traffic on the Health of Urban Cyclists in Hamilton

Student Author

Glenda Chiu, Engineering

Academic Supervisor

Kate Whalen, Academic Sustainability Programs



Cyclists travelling alongside truck
Photo credit: Business Insider

Overview

As urban areas are becoming increasingly populated, traffic congestion has worsened while more citizens have also turned to bicycling as a mode of transportation.¹ However, as cyclists travel alongside motor vehicles, they are exposed to high amounts of pollution. Emission levels vary by vehicle type, with heavy-duty trucks generating the highest amounts of air pollutants.² In Europe, although large trucks comprise 5% of vehicle traffic, they create 25% of total transport emissions.³

Cyclists in downtown Hamilton are especially exposed to these emissions resulting from the co-mingling of bike lanes and truck routes.⁴ In addition to safety concerns, the health impacts of truck emissions on cyclists must be examined in order to ensure that cyclists are aware and comfortable with their chosen mode and route of travel. The goal of this inquiry project was to explore how the removal of truck traffic from city streets improves air quality at the local level in downtown Hamilton.

Objectives

1. Identify the current impact of truck traffic on air quality in downtown Hamilton
2. Examine the alternatives to truck routes going through downtown Hamilton
3. Share findings, results, and recommendations with community groups

Reporting

The impact of truck traffic on air quality was investigated through secondary research and further supported by primary research using air quality measurements recorded in downtown Hamilton. Motor vehicles play a huge role in air pollution, and although trucks only make up 4.3% of all vehicles, they contribute to the majority of two major air pollutants, particulate matter (PM_{2.5} and PM₁₀) and nitrogen oxides (NO_x).⁵ Almost all trucks in North America are diesel-powered, with diesel exhaust containing high amounts of these particles, hence their disproportionate impact on air pollution from mobile sources.⁶ These pollutants have been proven to have detrimental respiratory and cardiovascular impacts on human health and are especially significant for cyclists with their higher inhalation rates. Because the impact of pollution decreases as the distance from the source increases, it is crucial to maximize the distance between cyclists and trucks.

While the City of Hamilton faces financial and political challenges in removing truck traffic from city streets, there are examples of solutions that have been successfully implemented in other cities from which Hamilton can draw inspiration. Improved bike infrastructure, re-mapping of bike routes, or city speed limit alterations were found to be potential solutions in Hamilton in order to support the health of cyclists and the needs of the trucking industry. Results from this inquiry project were shared with the City of Hamilton; Non-profit organizations, Cycle Hamilton and Environment Hamilton; and made publicly available online.

Collaborators

I would like to thank Kate Whalen for supervising this inquiry and providing continuous guidance and support throughout this project, Elise Desjardins from Cycle Hamilton for her assistance with my primary research and providing direction for this project, and Environment Hamilton for the use of the mobile air monitor used to conduct my primary research.

Implementing Smart City Solutions to Improve Hamilton Transportation

Student Author

Erin Varey, Engineering

Academic Supervisor

Kate Whalen, Academic Sustainability Programs



Hamilton Street Railway bus
Photo credit: Hamiltontransit.ca

Overview

Public transport is an optimal way to make commutes more sustainable. However, when I asked if the Hamilton Street Railway (HSR) was reliable, the majority of surveyed users responded “no” or “sometimes”.¹ Furthermore, in comparing modes of transportation, it takes on average 300% longer to get from the downtown bus terminal to campus when traveling by

bus rather than by car.² Cities that are similar to Hamilton in size and density also experience this problem. Stemming from these initial findings, the goal of this project was to understand how implementing smart city solutions could improve bus transport in urban Hamilton.³

Objectives

1. Understand why only a small percentage of Hamiltonians choose to take the bus
2. Identify possible solutions to these barriers
3. Analyze and evaluate the cost and feasibility of these solutions for Hamilton

Reporting

Through surveying users, reading news articles, and measuring travel time, I was able to better understand how reliability and travel time were key factors that would need improvement for bus travel to be a viable transportation option in Hamilton. I began investigating possible solutions to improve reliability and travel time, which led me to interviewing City staff to learn what modern technology Hamilton has already adopted and how they could be utilized in other ways to improve transportation. For example, the City has already installed smart traffic lights on some major corridors, but they are not being fully utilized to improve bus travel.⁴

My primary and secondary research, along with my engineering background, led me to the following two solutions: 1) Implement a transit priority system that will prioritize green lights for transit vehicles, and 2) market the existing Mon Transit HSR app that provides real time updates of bus arrivals.

When considering the feasibility of implementing these smart city solutions, I considered cost and the impact to other road users. I found that for only 1.2% of the City’s transportation budget, the travel time on an HSR bus could be reduced by up to 50%; we could see an improved sense of reliability by users; and the impact to other road users would be minimal and in some cases, such as for active users and emergency vehicles, the impact would be positive.

Collaborators

I would like to thank my inquiry supervisor Kate Whalen for her support throughout the project. I would also like thank Peter Topalovic, Daryl Bender, and the many other members of City staff who provided me with valuable perspectives and information about Hamilton’s transportation system.

Hungry for Knowledge: Student Experiences of Food Insecurity at McMaster University

Student Author

Diana Williams, Social Sciences

Academic Supervisor

Dr. Tina Moffat, McMaster Anthropology Department



Students access to nutritious quality foods while in university is diminished when experiencing food insecurity due to financial and time constraints
Photo credit: Joe Hoffman

Overview

Student food insecurity is a pressing issue across post-secondary institutions in Canada. Food insecurity is defined as a lack of access to appropriate food to support a healthy and active life and includes dimensions of financial access to food as well as access through cultural and dietary health needs.^{1,2,3,4} Food and nutrition are vital for long-term health and wellbeing and poor dietary patterns experienced through food insecurity may predispose young adults to an increased risk of health challenges during their post-secondary education and chronic disease risk in later life.^{5,6,7,8,9}

A 13-question semi-structured interview guide was created to interview seven McMaster undergraduate students about experiences with food insecurity and its effects on their academic trajectory, as well as their physical, mental, and social well-being.

The main goal of this project was to understand the lived experiences of student food insecurity and to engage the appropriate stakeholders to better inform the McMaster community for planning future interventions.

Objectives

1. Understand how food insecurity impacts students' academic achievement, and their health and well-being
2. Determine if food insecurity alters students' perceptions of themselves and how they cope with constraints in accessing appropriate food
3. Investigate barriers to awareness and use of campus and community food supports

Reporting

Seven undergraduate students who have experienced food insecurity while studying at McMaster were engaged in one-on-one interviews to achieve this project's objectives. Students related at length the difficulties and challenges they experience in regard to being food insecure while studying and how this impacts their physical, mental, and social lives as well as their academic achievement and ability to actively engage in their studies. The interviews were transcribed verbatim, coded, and thematically analyzed. Four main themes emerged from the data in regard to students' experiences of food insecurity:

1. **Competing priorities and responsibilities** students are facing in their personal and academic lives, such as living with constrained finances and struggling to manage academic and employment responsibilities.
2. **Disordered eating** was both a response to cope with food insecurity and a by-product of it, as students changed their eating patterns and frequency, became complacent about hunger, and altered the quality of food they consumed to maintain their limited finances. These behaviours were spoken about as creating noticeable health challenges and effects for these students.
3. **Internalized guilt** was associated with food and eating, stemming from students' financial constraints that affected their sense of self-worth, and their ability to engage in social aspects of food and eating. As a result of dietary changes due to food insecurity many students were unable to maintain cultural, religious, and health-based food observances that further compounded their feelings of guilt.
4. **Identity conflict** was a common finding because students did not identify with the type of person they deemed as someone who needed to access food support services. There was a lack of awareness of campus food supports, as well as perceptions of stigma about these services that limited their use.

Collaborators

I would like to sincerely thank Dr. Tina Moffat for supervising me in all aspects of completing this study. I am also grateful for the insight and feedback I received from Merryn Maynard, Kate Whalen, Stephanie Bertolo, and Sashaina Singh. I would like to thank the three students from SUSTAIN 3S03 who conducted and analysed the Hungry for Knowledge online survey. In addition, I am most appreciative for the financial donations I received to compensate interview participants from the McMaster Institute for Healthier Environments (MIHE) and the McMaster Community Poverty Initiative (MCPI). Most importantly, I am very thankful and appreciative to the undergraduate students who gave me their time as their voices made this study come to life.

Community-based Leadership in Sustainability Program



Community-based Leadership in Sustainability Program

The Community-based Leadership in Sustainability (CLS) initiative was created in the fall of 2014 as a joint initiative between a number of groups and organizations with the goal to develop a culture of sustainability through education, community engagement, and collaboration that inspires practical implementation. The central focus of the initiative was to host a series of educational and networking events each year. The events were designed to take a unique approach to teaching and learning about, as well as engaging in, sustainability that would provide value to individuals, groups, organizations, institutions, businesses, and the City of Hamilton alike. Furthermore, we hoped that through this initiative, connections were made and new ideas generated that may provide benefit to the city as a whole. One of the main objectives of the CLS initiative was to offer these educational and networking events without barriers. As such, the events were open to all and free of charge.

Objectives

- Develop a culture of sustainability through education, community engagement, and collaboration that inspires practical implementation
- Form and foster a collaborative and formal working relationship between individuals, groups, institutions, and organizations who share a common mission to advance sustainability within the city of Hamilton
- Offer opportunities for sustainability education and involvement that is inclusive of various groups and individuals within the city's diverse and unique communities
- Communicate and report on the outcomes of each event and the initiative as a whole

Reporting

It was with mixed emotions that we chose not to continue the CLS initiative in the fall of 2018. While successful, the required resources made the continuation of the initiative unsustainable for our department. However, in the four years since the initiative's launch, there had been 14 events in total, all of which were hosted at local and accessible community locations. Through these events, we engaged over 1,300 individuals, including 45 speakers, and 195 volunteers. Over \$22,000 in sponsorship and donation had been generously provided, enabling us to offer engaging, community-based, and barrier-free events.

Collaborators

The CLS initiative is a product of the hard work and dedication from the Hamilton Sustainability Professionals Network, various individuals and departments of McMaster University; our volunteers, speakers, sponsors, and donors; as well as the engaged community members who supported the initiative by attending and investing their time through active participation in the various events.

A full reporting of each event in the CLS series can be found at asp.mcmaster.ca/our-story/reports-publications/.

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