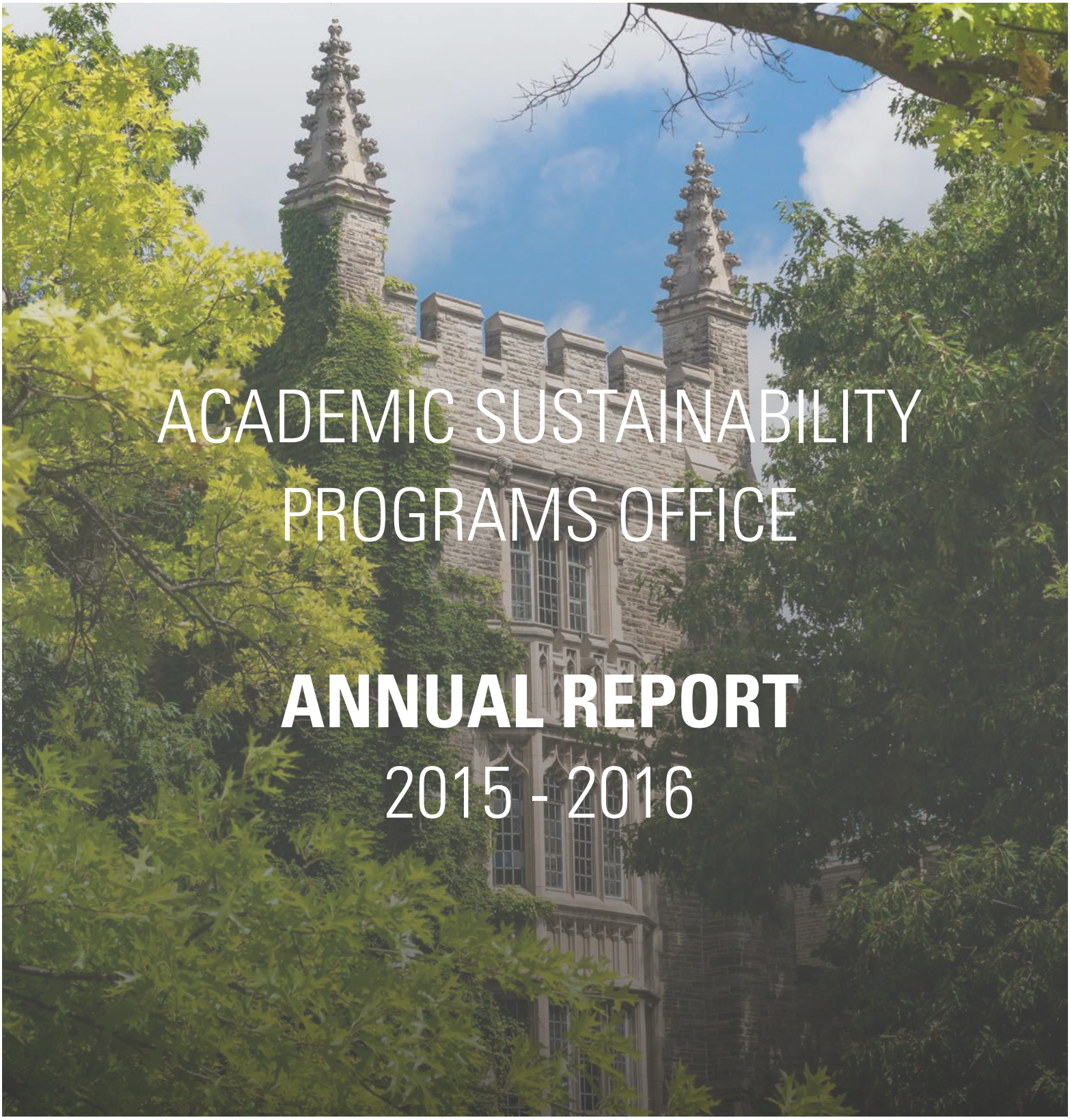


ACADEMIC SUSTAINABILITY PROGRAMS OFFICE

ANNUAL REPORT

2015 - 2016

McMaster University
Academic Sustainability Programs Office

A LETTER FROM THE SENIOR MANAGER

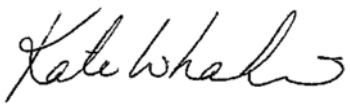
This past year, the students, staff, and members of the community that make up and support McMaster's Academic Sustainability Programs (ASP) Office have made great strides to advance the Office's mission to inspire in all students a desire for continued learning and inquiry through experiential education. We have done this by providing students with unique opportunities for interdisciplinary, student-led, community-based, and experiential learning related to sustainability.

Between September 2015 and June 2016, McMaster saw 14 students graduate with an Interdisciplinary Minor in Sustainability; which has been offered at the University for the past two years. The efforts made to promote the Minor to students have been successful and I am inspired by the shift that has taken place whereby students are approaching their study of sustainability with a greater emphasis. The Sustainable Future Program has also seen substantial growth since its first course was offered in the Winter of 2013. In response to overwhelming demand, the program was expanded in two ways – the level-one course was doubled in capacity and a full-year level-four course focusing on large-scale project-implementation was developed. We anticipate that over 450 students, representing all faculties, will successfully complete a Sustain course this coming year.

Through the Sustainability Internship Program and Graduate/Undergraduate Collaboration in Experiential Learning Program, we continue to support 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 our relationship with the broader community, with a focus on fostering deep collaborations, as well as generating action and dialogue among community members through active engagement. The Community-based Leadership in Sustainability (CLS) initiative has been a conduit to support these efforts. This past year, through three CLS events, we worked and learned together with hundreds of members of the community including volunteers, speakers, sponsors and donors, researchers, event attendees, and more.

I aspire that this annual report comes to represent more than a collection of accomplishments. I hope you will reflect on the student 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 these stories as much as I have enjoyed working with the individuals who created them.



KATE WHALEN

MISSION & VISION

OUR MISSION

To inspire in all our 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 focused on sustainability. Key to achieving these objectives is developing and fostering strong community connections, both within the University and the broader city of Hamilton, and supporting students to equip themselves with the knowledge, skills, and abilities to be successful in their learning. This is instrumental to their success as lifelong learners.

PRIORITY PROGRAMS

To achieve our objectives, McMaster's Academic Sustainability Programs Office offers the following 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 to complement their undergraduate degree and education.
- **Sustainable Future Program:** A suite of four undergraduate courses focused on sustainability. Courses are open to all students, independent of their home faculty.
- **Sustainability Internship Program:** An opportunity for 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 students to work in collaboration with undergraduate and graduate students to develop and implement a real-world sustainability project and receive academic recognition upon successful completion.
- **Community-based Leadership in Sustainability (CLS):** Opportunities to connect with diverse members of the community around local sustainability issues, facilitated through a series of free events and workshops that are open to all.

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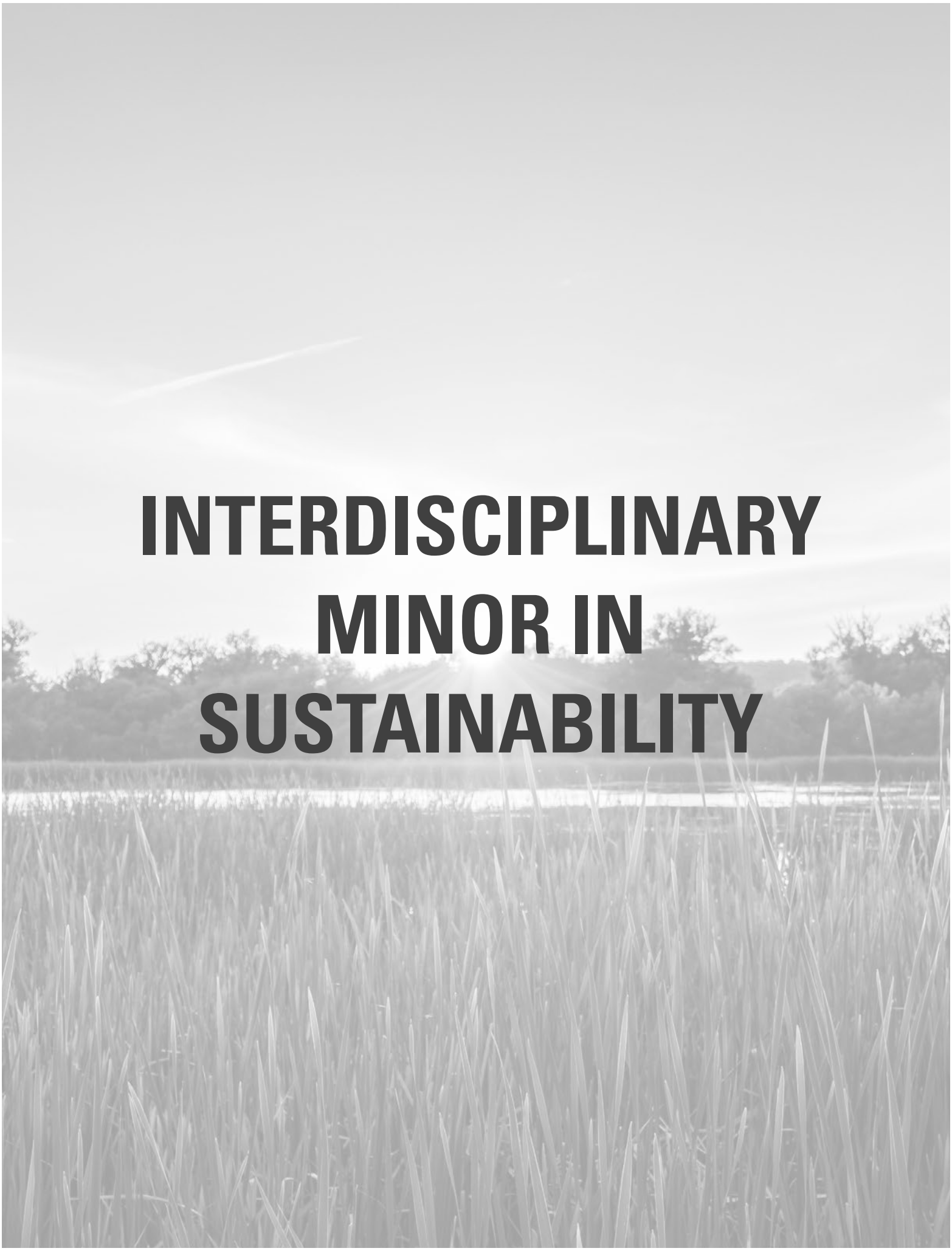


INTERDISCIPLINARY MINOR IN SUSTAINABILITY

INTERDISCIPLINARY MINOR IN SUSTAINABILITY

Addressing sustainability in our society poses interdisciplinary 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

- Promote engagement among students, faculty, and staff across all faculties, facilitating interdisciplinary learning.
- 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.
- Provide opportunities to meaningfully engage with communities both within and outside of McMaster.
- Encourage opportunities for student experiential learning about sustainability.

REPORTING

Through the development and implementation of McMaster's Interdisciplinary Minor in Sustainability, students are now able to choose from over 60 courses from faculties across campus to gain a truly interdisciplinary perspective of sustainability, as well as tailor a minor that complements their major. In only two years of operation, 19 students have declared 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 and Rebecca Bishop. 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; the Arts & Science Program for providing an administrative home for the Minor; the faculty members who have opened up 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.

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.

Three main areas have been of primary focus in the early stages of the Minor's implementation:
1) Developing the list of available courses from faculties across campus.
2) Refining the administrative processes involved to ensure the Minor is accessible to students.
3) Communicating to current and incoming students about the opportunity to pursue the Minor.

Enhancing flexibility and accessibility of the Minor, as well as communicating the opportunity to incoming and current students early on, is integral to providing a positive and meaningful experience for the students and to ensure long-term success and sustainability of the Minor.

OBJECTIVES

- Develop the Minor Course List by reviewing applicable courses from all faculties and incorporating those that support 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

In its inaugural year, starting in September 2014, five students graduated with an Interdisciplinary Minor in Sustainability. This past year, 14 students graduated with the Minor. We are encouraged by these numbers as they demonstrate interest and increasing demand for this Minor.

Despite this early success, improvements were made that were geared toward achieving the Minor's objectives and include the following:

- McMaster's Interdisciplinary Minor in Sustainability Committee members reviewed new and existing courses from their specific Faculty. These consultations led to eight courses from four Faculties being proposed and accepted for inclusion starting in 2016.
- Administrative challenges associated with the novelty of implementing a truly interdisciplinary minor arose during the initial two years of the Minor. Challenges included: Faculty-specific requirements for double counting courses required for a student's major, and confusion arising from cross-listed courses and interdisciplinary programs. Through working with representatives in each faculty, specifically the academic advisors, solutions were proposed, processes were revised, and some policy changes are under consideration.

REPORTING (CONTINUED)

- Student consultations revealed that initial communication strategies were effective but needed to be continued and enhanced. In response, the Academic Sustainability Programs (ASP) Office was present at more events and produced a poster and promotional brochure that were shared with students by faculties and departments across campus. In addition, the ASP Office enhanced social media efforts resulting in 108% increase in Facebook followers alone and developed additional connections within each faculty to assist in promotional efforts.
- High demand for the one required course, Sustain 1S03, led to a doubling of capacity in this course. The Sustain 1S03 course will be offered in Term 1 and Term 2, starting in the 2016/17 academic year.

While these efforts have proved successful, we will continue to enhance the program next year by developing additional opportunities for connection and community-building between the students, faculty, staff, and members of the community.

THIS YEAR'S COLLABORATORS

Our sincerest appreciation to the Arts & Science Program for providing ongoing administrative support as well as instrumental guidance to help grow and enhance the Minor: Jean Wilson, Director, Arts & Science Program; Shelley Anderson, Program Administrator; and Rebecca Bishop, Program Administrator.

We would like to thank all members of the Interdisciplinary Minor in Sustainability Committee for their support:

Brent McKnight, Assistant Professor, DeGroote School of Business; Kate Whalen, Senior Manager, Academic Sustainability Programs Office; Luc Bernier, Assistant Professor, School of Geography & Earth Sciences; Rebecca Bishop, Program Administrator, Arts & Science Program; Cameron Churchill, Director, Engineering & Society Program; Carlos Filipe, Professor/Chair, Chemical Engineering; Dustin Garrick, Assistant Professor and Philomathia Chair of Water Policy, and Walter G. Booth School of Engineering Practice; Chad Harvey, Assistant Professor, Integrated Science Program; John Maclachlan, CLA, School of Geography & Earth Sciences; Judy Major-Girardin, Associate Professor, School of the Arts; Shanti Morell-Hart, Assistant Professor, Anthropology; Dean Mountain, Professor, DeGroote School of Business; Susie O'Brien, Associate Professor, Department of English & Cultural Studies; Maureen Padden, Associate Professor, School of Geography & Earth Sciences; and Sandra Preston, Assistant Professor, School of Social Work.

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.

SUSTAINABLE FUTURE PROGRAM

SUSTAINABLE FUTURE PROGRAM

The Sustainable Future Program (SFP) consists of a suite of undergraduate courses focused on providing students with the opportunity for interdisciplinary, student-led, community-based, and experiential education focused on 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 engage in experiential learning through developing and implementing real-world sustainability initiatives. 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 three courses and has supported nearly 300 students in the 2015/16 academic year. By doubling the offering of Sustain 1S03 and adding a fourth course, Sustain 4S06, in 2016/17, enrolment is anticipated to reach 500 students per year by 2018/19.

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 Engineering & Society Program for providing guidance and administrative support for the Sustainable Future Program.

YEAR IN REVIEW

The Sustainable Future Program has grown each year since the first course was offered in 2013, both through addition of new courses and enhancement of existing courses. In 2014, we began to receive questions from current sustainability students and members of the community who had been involved with student projects, asking if there would soon be a level-four course to complete the Program. From these initial discussions, and after confirming administrative support to proceed with a proposal, we began to develop the senior course. The course would aim to combine the knowledge from previous courses, as well as provide students with the opportunity to apply their learning in a way that would enhance their understanding and bridge the gap between their undergraduate education and what comes post-graduation. The development and implementation of the level-four course was the initiative of focus throughout the 2015/16 academic year.

OBJECTIVES

The specific objectives in course development are as follows:

- Provide opportunities for students to lead a large-scale project within the community.
- Ensure students can work in interdisciplinary teams.
- Enhance the student experience.

REPORTING

Throughout the winter of 2015 and spring of 2016, we consulted with past Community Project Champions, ran online surveys, held luncheons for sustainability students, and sought advice from faculty and staff involved in providing similar educational experiences. We learned a great deal through our consultations, specifically that community members want to involve upper-year students in large-scale and multi-faceted projects. Furthermore, we learned that students want more time to focus on their projects and that one term was not enough for large scale project implementation. We were also made aware of University resources available to support development of essential skills necessary for students to tackle complex problems.

REPORTING (CONTINUED)

The feedback helped develop a course that would meet our stated objectives and add value to our students, the community, and the University. Sustain 4S06 - Leadership in Sustainability, was approved by the University in November 2015 and will take place for the first time starting September 2016. Sustain 4S06 will enable 30 students from faculties across campus to work in interdisciplinary teams to solve sustainability problems within the Hamilton community. Through a focus on providing interdisciplinary, student-led, community-based, and experiential learning, we hope to enhance the student experience and directly advance the mission of the Academic Sustainability Programs Office.

THIS YEAR'S COLLABORATORS

We would like to thank all of the community members who met with us, responded to our surveys, and provided us with their feedback. A special thanks goes to the students who communicated their vision for what the course would look like if it was unconstrained and completely up to them to design. The faculty and staff members who helped identify resources to support students in applying their knowledge in novel and real-world settings have been instrumental in enabling us to support the diverse learning objectives of the course. The Academic Sustainability Programs Office team of student-staff, program administrators, and faculty members brought together the various components to help develop a course that would realize a vision developed through collaboration.

CITY OF HAMILTON BIKE PARKING INVENTORY AND ANALYSIS

STUDENT AUTHORS:

Tabbish Aziz, Matthew Halleran, Agstya Kaul & Tom Yang

OVERVIEW

From an environmental perspective, cycling reduces greenhouse gas emissions, which helps to fight climate change by providing a transportation alternative to motor vehicles.[1] In 2015, the City of Hamilton inventoried locations and conditions of all bike racks in Wards 1, 2, 3, 11, 12, 13, 14, and 15 within the city, with Wards 4 through 10 nearing completion. The inventory data provided the opportunity for further analysis and recommendations for improvement. The main goals of this project are to analyse the data and provide the City of Hamilton with recommendations for next steps, specifically with respect to future bike rack placement and management. When additional bike racks are installed, more people will likely use the strategically placed stations, reducing the number of cars on the road. This will lower the air and noise pollution in Hamilton, and help make this community more sustainable.[1]

OBJECTIVES

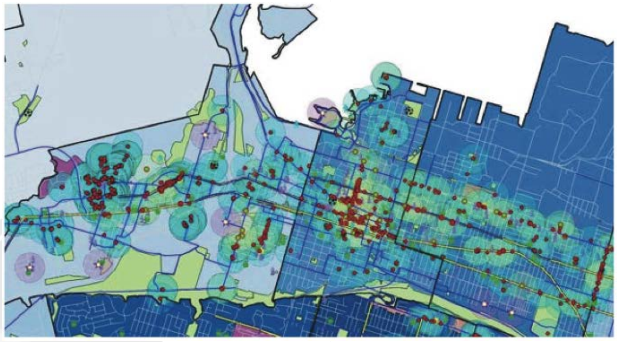
1. Conduct a gap analysis to identify priority locations for new bike rack installations based on inventory data and detailed criteria provided by the City of Hamilton.

2. Develop a method of organizing and maintaining all inventory data on an ongoing basis.

3. Develop a geographical representation of existing and planned bike racks along with other relevant information, such as population and places of interest.

REPORTING

To support our project, the City of Hamilton provided us with detailed information from their most recent inventory of City-owned bike racks, which included bike rack location, condition, capacity, and many other metrics. We then utilized geographic information software (GIS) to perform a gap analysis to see which locations in Hamilton were currently under-serviced by bicycle parking infrastructure based off a detailed criterion provided to us by the City of Hamilton. After assessing the data provided by the City and identifying key locations of interest, which include places of worship, schools, and malls, seven key bike rack locations have been proposed along with justifications for each. Methods to improve the City of Hamilton's cycling records have been developed in order to increase the accuracy and efficiency of data collection by observing practices carried out by the City of Toronto. The data gathered over the course of this report has been integrated in a GIS database, which shows all existing and potential bike racks provided by the City of Hamilton, along with bike racks proposed by our group. In addition to this integration, demographic data and locations of interest have also been shown in the GIS in conjunction with the bike rack information. This map will give the City of Hamilton a clear visual of their bicycle infrastructure throughout the city, and can potentially be used by the public if they wish to know the locations of bicycle racks in Hamilton. In order to summarize all of the deliverables mentioned above, a proposal report has been submitted to the City of Hamilton.



GIS of Existing and Proposed Bike Racks in Wards 1, 2, and 3.

COLLABORATORS: We would like to thank our Community Project Champion, Janelle Trant. Janelle was instrumental in providing us with inventory data, acting as a liaison with others at the City of Hamilton, and providing guidance and mentorship throughout. Additional support for our project was provided by Crystal Chan, Teaching Assistant for Sustain 3S03, and Kate Whalen, Senior Manager, Academic Sustainability Programs, McMaster University.

1 Retrieved from Share The Road: http://www.sharetheroad.ca/what-are-the-benefits-to-government-when-they-invest-in-cycling--p128284

COMMUNICATING SUSTAINABILITY IN A HEALTHCARE SETTING

STUDENT AUTHORS:

Ahmad Zubair Banoor, Joshua Del Gobbo & Srishti Harnal

OVERVIEW

Waste management is an important issue to healthcare. Improper management of waste products can pose health risks to patients, staff, visitors, and members of the community. St. Joseph's Healthcare Hamilton (SJHH) seeks to minimize the impact health operations have on human health by managing waste sustainably. With several new initiatives in place, SJHH has created a communications strategy to keep its staff informed and engaged in the collective effort to recycle, as well as to reduce and dispose of waste properly. With support from the Waste Management and Sustainability Department at SJHH, our project aims to increase recycling and reduce waste through informative posters displayed to hospital staff. Measures of success will be evaluated through location-specific waste audits.

OBJECTIVES

1. Create a package of up to 15 informative posters that will assist SJHH staff understanding of proper recycling and waste disposal practices, as outlined by the Environmental Cooperative Program (ECO).

2. Ensure the availability of posters relating to waste and sustainability topics to staff and general public.

3. Assess staff and general public understanding of waste and sustainability topics after creation and distribution of posters, through quantitative assessment of waste generation.

REPORTING

On Monday September 28th, our group visited the Charlton campus. The group toured the waste management holding and handling area, and from this learned that an elephant's weight (or 2.5 tonnes) of waste is produced on average at the Charlton campus each day. We also reviewed the '365 Days of Green' campaign posters released in late 2014 by SJHH's Environmental Cooperative Program (ECO). Our project goals were to complement the '365 Days of Green' campaign posters by analyzing the 2014 waste audit of the Charlton campus and determining the most viable waste reduction initiatives to be placed on the posters we would design. A poster template was created to ensure all posters followed the branding protocols of the ECO program. With guidance from our CPC, we then decided on the 15 waste reduction topics that would be addressed individually on the posters. These topics ranged from: 'Turn off the lights,' 'What is not biohazardous waste,' and 'Turning off computer screens.' While continuously designing our posters, we began preparing ways to assess the staff's understanding of our posters. Due to incidents of improper sorting of recycling in the operating rooms (ORs), our CPC advised that we complete a recycling audit to understand if the newly implemented OR recycling containers and info-posters are effective. While the posters were not created by the group, the posters are part of the same ECO Program messaging campaign. Implemented in 6 of 13 ORs, the new recycling hampers contain an info-poster on the lid, instructing the user to not recycle gloves and pictures of recyclable material. Recycling was collected over an 8 hour period from the ORs and put aside to sort. On December 1st, the team audited the recycling hampers and determined that the ORs without info-posters produced 62.3% more recycling waste than the ORs that had info-posters on the hampers. Furthermore, the group analyzed that hampers without info-posters contained 155% more contaminated waste. Therefore, it was concluded that notifying the hospital staff by means of educational posters is an effective way to communicate the proper recycling methods within the hospital.

COLLABORATORS: Collaborators involved in this project include our Sustainability 3S03 group: Ahmad Zubair Banoor (Honours Life Sciences, Faculty of Science), Joshua Del Gobbo (Honours Kinesiology, Faculty of Science), and Srishti Harnal (Honours Biology & Pharmacology Co-op, Faculty of Science). We gratefully acknowledge the support and guidance of our Community Project Champion Victoria Brzozowski, Sustainability & Waste Management Coordinator at St. Joseph's Healthcare Hamilton, with her knowledge and novel experience of the waste management sector at SJHH that she provided us with.

COMMUNITY CARSHARE AT MCMASTER

STUDENT AUTHORS:

Rubaid Dhillon, Amanul Haque, Sushen Talwar & Dillon Phoenix

OVERVIEW

Developed in 1998, Community CarShare is a non-profit co-operative organization that provides carsharing services in several areas in Ontario. The goal of Community CarShare is to promote carsharing as an important component of a sustainable transportation system thereby reducing traffic congestion and transportation costs. The organization has grown from two vehicles to sixty-four vehicles. Through this project, we aim to inform the students at McMaster University about the environmental, social, and economic benefits of carsharing and thus, resulting in greater use of carsharing by the McMaster population.

OBJECTIVES

1. Identify current travel preferences and habits as well as knowledge and applicability of carsharing to members of the McMaster community.

2. Promote Community CarShare through an interactive event to attract first-time users in the McMaster community.

3. Partner with an organization with the common goal or mission statement such as Hamilton Bike Share.

REPORTING

We surveyed students about their most frequent mode of transportation, average distance travelled, and familiarity with the different carshare services available. Through the 120 completed surveys, the data showed that 70% of students do not own a car. Furthermore, 64% are aware of the existence of Community CarShare.

On November 18th 2015, we organized an event on campus in front of University Hall where we had representatives from Community CarShare to help us promote the organization and our project goals. In order to attract students, one of the cars from Community CarShare organization was brought to the event and was displayed along with the organization's banners and posters. During this event, promotional material, such as $30 discount coupons, and a brief summary of our project were handed out to students. The event was successful as several students were eager to learn about our project initiatives and sign up for Community CarShare. Through this event, valuable information was obtained about the perceptions and values of the student demographic which was instrumental in discussing the data with Community CarShare for recommendations for future initiatives to increase membership.

During the completion of our project, we were also able to get in touch with the Community Manager of Hamilton Bike Share and were able to further promote the sustainability initiatives of the Community CarShare organization through their social network. The Regional Services Coordinator of Community CarShare will keep us informed in terms of the number of customers signed up by January 2016 and this will allow us to further evaluate the success of our project.

COLLABORATORS: We would like to thank our Project Champions Laura Beattie and Jess Webster (currently the Regional Services Coordinator of Community CarShare) for supporting us throughout the project and for providing us with all the promotional material and feedback regarding our ideas. In addition, we would also like to thank the Community Manager of Hamilton Bike Share Chelsea Cox, Kate Whalen and the Academic Sustainability Programs Office for the support and guidance throughout the project.

HALTON CONSUMER FOOD WASTE ADVOCACY TEAM: PROMOTING CONSCIOUS CONSUMPTION

STUDENT AUTHORS:

Sarah Dzin, Sohana Farhin, Agatha Maciaszek, Varun Muddaluru & Aheen Mukherjee

OVERVIEW

Food is a vital component for life, however one-third of food produced for human consumption is lost or wasted globally. Our experiential learning project focused on the problem of food waste at the consumer level, as Canadian households are responsible for 47% of the total $31 billion wasted on this problem across the country. We aspired to understand widespread consumer values and behaviours through the implementation of a survey while simultaneously, raising awareness on this issue. Influencing individual's to become conscious consumers was realized through the dissemination of a brochure, a visual presentation board combined with an effective dialogue.

OBJECTIVES

1. Create awareness about consumer food waste.
2. Survey grocery store customers in the Halton Region to identify consumer attitudes.
3. Analyze and interpret survey results and exhibit them in an Executive Summary.
4. Present project overview, survey results, and suggest food waste reduction programs to the Halton Food Council.

REPORTING

We successfully executed the objectives of the project by raising awareness and learning about consumer food waste attitudes and behaviours. First, our team performed a literature review of articles and video materials pertaining to consumer food waste in the United States, Canada, and Europe. We used information from the articles and videos to create a brochure and presentation board to raise awareness, and a survey to learn about consumer food waste attitudes.

To target consumers in the Halton Region, the team approached Longo's and Farmer Jack's Market in the Fairview and Guelph Line neighbourhood to set up a kiosk and conduct the survey. The survey was approved by the McMaster Ethics Board and we obtained appropriate insurance coverage in order to conduct our survey on-site. Between November 21st to the 28th, we connected with and distributed brochures to over 150 customers at Longo's and Farmer Jack's Market. Furthermore, we surveyed 26 customers at Longo's, 18 at Farmer Jack's Market, and an additional 13 residents from Halton region. Following our community engagement and data collection, we analyzed the survey results to find correlations between various demographic categories (age, gender, income, marital status, and household composition) and food waste patterns. A major finding was that young adults (25-44 years old) disposed of food based on the expiration date labels, while the primary considerations for respondents 65 and over were appearance, texture and/or smell of the food. Younger individuals are dependent on labels to determine freshness and the older generation relies on their senses, associated with the fact that many individuals 65 or older may not have grown up with widespread food labels. The survey results and recommended next steps were described in an Executive Summary, and the results of which were formally presented to council members of the Halton Food Council.

COLLABORATORS: We would like to thank our Community Project Champions, Moira Matsubuchi-Shaw and Anna De-Marchi-Meyers who are members of the Halton Food Council (HFC), for guiding us throughout the semester. Moira provided us with quality literature materials, efficiently critiqued our documents, and composed a letter of recognition to provide our proof of collaboration with the HFC. We would also like to thank Longo's and Farmer Jack's in the Fairview and Guelph Line neighbourhood in Burlington. These retailers provided us with a platform to raise awareness on the issue and learn about consumer attitudes and behaviours towards food waste. And last, but not least, we would like to thank all of the individuals who took the time to connect with us and complete our survey.

HAMILTON BURLINGTON TRAILS

STUDENT AUTHORS:

Geetha Ramachandran, Ibrahim Kareemi, Jasmine Wong, Kritika Badhan & Neil Reu

OVERVIEW

The Hamilton Burlington Trails Council (HBTC) is a non-profit organization that serves as a trail alliance in developing an exceptional trail system in the Hamilton and Burlington regions. The HBTC recently launched their 2015-2016 Trail Use Survey to facilitate the development of a more effective and accessible trail system. The goals of this project were to support the HBTC in conducting and analyzing their survey as well as to make recommendations for positive change and trail enhancement.

OBJECTIVES

1. Create and implement a volunteer recruitment and engagement strategy to support the collection of survey responses at various Hamilton-Burlington trail locations.

2. Engage users of the trail system to provide feedback through the Trail Use Survey

3. Analyze collected information to identify opportunities for improvement

4. Present opportunities for trail enhancement that would result in improved trail use, based on data collected from July to September 2015.

REPORTING

Volunteer recruitment was targeted though the design and use of posters and social media. In addition, to convey appreciation for our thirty volunteers, we planned a volunteer appreciation event, which was scheduled to occur on November 12th 2015 at 6:00pm. However, the event was cancelled due to a low response rate of volunteers. While analyzing the reason behind the failure of the event, we concluded that a hike in Cootes Paradise in November could have deterred the participation of volunteers since it was extremely cold. Therefore, our project champions will now take the plan and use it in April when the event will be rescheduled. Moreover, to collect more information regarding trail use, each team member attended a weekly 2-hour survey shift in Hamilton and Burlington. Simultaneously, we inputted all the surveys from May to September 2015 and analyzed the results.

The analysis discussed modes of transportation used on trails, prominent reasons for trail use, and trail concerns. The statistics showed that 54.87% of trail users used the trails for walking, 29.74% for cycling, 8.99% for jogging, 4.59% considered other mode, 1.21% had strollers, and 0.60% used wheelchairs/walkers. Furthermore, the analyzed results suggested that trail users primarily used the trails for exercise, to enjoy nature, and very rarely for tourism. Since exercise is the most common use of the trails, improvements such as distance markers, and simple exercising equipment should be implemented. Moreover, Figure 1 displays an increased trail use during summer months and reduced trail use during winter months. The reason behind reduced trail use in winter could be due to inadequate trail maintenance. Therefore, snow clearance, garbage removal and directional signs should be implemented to ameliorate trail maintenance. These considerations will be taken into account, and appropriately addressed to the council by our project champions.

COLLABORATORS: In collaboration with the HBTC, the team collected surveys, and promoted trail use. We would like to thank our Teaching Assistants Crystal Chan and Elise Desjardins for guidance and support throughout the project. We would also like to thank our project champions Alex and Victoria for providing us with information, resources and guidance pertaining to the project. Last but not least, we would like to thank all the volunteers who collected surveys. To obtain more information about the project please visit our Facebook page, follow us on twitter or visit our website: http://hamiltonburlingtontrails.ca.

RANDOM ACT OF KINDNESS

STUDENT AUTHORS:
Omar Balbaa, Charlie Coe & Sandra Hernandez

OVERVIEW

The Canadian subsidiary of Office Depot, Grand & Toy Limited (G&T), founded in 1882, wanted to improve their corporate culture by enhancing the relationships across their branches as well as internally. This was done by implementing a "Random Act of Kindness (RAK) Day" which was held on November 6, 2015. It consisted of doing good deeds for others in the community and/or encouraging one another through kind notes posted on a "kindness tree". The main objective was to improve the relationships between various branches across the country internally (between the employees at G&T) and externally (between G&T, their customers and other community members). Although this is the first time Grant & Toy attempted to host the Random Act of Kindness Day, the hopes are for it to continue yearly and become a long-term commitment to their associates and the community.

OBJECTIVES

1. Engage all Canadian locations of G&T offices to participate in Random Act of Kindness Day.

2. Measure the impact of the event through participation and community involvement on social media.

3. Conduct an online survey at all participating and non-participating Grand & Toy locations to obtain feedback and make recommendations for future Random Acts of Kindness events on years to come.

REPORTING

The project's main focus was the creation of a Random Act of Kindness day on November 6th 2015 alongside Grand & Toy, while focusing on internal engagement across agencies as well as on each individual location with their respective communities. Internal and external engagement was discussed with all locations involved ensuring its completion. Communication such as emails, Facebook and Twitter announcements along with delivery of kindness trees and supplies were done as scheduled. The project was deemed successful as nine out of the twelve locations contacted participated in the event. Four event locations participated internally and externally through the use of the kindness tree and donations to their local food banks or shelters. In addition, five locations participated actively in the community by distributing candy, hamburgers, recycled bags and, cards to members of their communities.

There was a remarkable response and online participation with the Grant & Toy RAK event as the potential number of people reached was 139 000. There were 538 interactions between Grand & Toy and their online users that day. Page impressions jumped from an average of 2.6 thousand to 5.8 thousand on the day of the event. On Twitter, the Grand & Toy page received over 80 tweets and through Facebook, there were 123 new likes from the 9000 users that accessed the page on the day of.

The survey that was conducted from the employees in G&T showed clear benefits to holding a Random Act of Kindness day. From the surveys conducted after the event, we found that over 60% of the people participating felt that RAK day affected their day in a positive way. Almost 70% of participants would like to have it happen again in the coming years, and are inclined to pay it forward due to this event.

COLLABORATORS: We would like to thank our Community Project Champions: Serguei Tchertok, Sustainability Manager at Grand & Toy, and Tiffany Scott, Business Development Manager at Grand & Toy.

RANDOM ACT OF KINDNESS DAY® (RAK): MCMASTER OUTREACH

STUDENT AUTHORS:

Morgan Brauer, Hannah Hinchey & Jonathon Tonietto

OVERVIEW

This project was initiated with the aim to instil positivity and joy through acts of kindness in communities surrounding Grand & Toy's (G&T) offices across Canada. Members from G&T distributed positivity cards, performed acts of kindness such as high fives, holding doors for individuals, as well as collected food donations for local charities. Originally, RAK Day started when one of the foundations volunteer's was given a free parking pass from an anonymous individual. The common theme that RAK Day and the "Pay it Forward" movement share is to create social sustainability through genuine acts of helping others without expecting incentives of any kind. These actions help to restore childhood optimism and aim to create human connection through individual interactions. On November 6th 2016, the McMaster Community participated in RAK Day.

OBJECTIVES

1. Identify opportunities to promote McMaster's RAK Day through social media, leading up to and on the day of the event.

2. Share the Pay it Forward message through taking part in RAK Day at McMaster on November 6th, 2015.

3. Quantify the results of individuals impacted by RAK Day at McMaster.

REPORTING

To build excitement leading up to the event, we created a social media presence by making a Facebook group, which reached over 200 participants. When RAK Day occurred, members of the McMaster community joined individuals from G&T and other communities all across the country taking part in the initiative. Volunteers from across Canada took part in activities geared toward the promotion of actions that instilled positivity and happiness. Our group procured a spot in the middle of McMaster's Student Centre where we hung a "kindness tree" for people to leave their "leafs" containing positive messages and ideologies, envisioned or witnessed. We were able to collect 235 leafs for the tree.

The group utilized the location in the Student Centre to interact with traffic traveling through the space between classes and persons waiting in lines for services. Throughout the day, our group handed out over 400 cards containing inspirational messages, over 400 pieces of candy as well as demonstrated positive actions towards a range of individuals. The ways in which intangible happiness was analyzed included the trending of tweets on the day of the event, the reactions received to the kind actions and gifts, in addition to the reactions viewed during our interactions with people throughout the day. Individuals were leaving after interacting with group members noticeably more cheerful and the group witnessed a few embrace the idea of paying it forward. Media played a big factor in our event, and we concluded by holding a contest to promote RAK where six participants won McMaster shirts donated for the event.

COLLABORATORS: We would like to thank our Community Project Champions: Serguei Tchertok, Sustainability Manager at Grand & Toy, and Tiffany Scott, Business Development Manager at Grand & Toy for providing the handouts and supplies for the event as well as guiding us throughout the semester. Finally, we would like to thank the other Random Act of Kindness Day® Internal group for all of their help and support on the Day.

SMALL FARM BIODIVERSITY AND POLLINATOR HABITAT

STUDENT AUTHORS:

Hussain Abbas, Duncan Chambers, Liana Glass, Luc Hains & Jordan MacCarthy-Tilley

OVERVIEW

Common Ground Teaching Farm is a small-scale organic farm located in Mount Hope, Ontario, Canada. As with most farms, Common Ground depends on ecosystem services, including insect-pollination of flowering crop plants. In line with the principles of organic agriculture, Common Ground does not use synthetic herbicides or pesticides, warranting alternative methods of pest control. The goal of this project was to increase Common Ground's biodiversity by focusing on three main areas: pollinator attraction and activity, predator-based pest control, and the farm's supporting infrastructure. A more biodiverse surrounding environment will foster a more resilient and productive farm ecosystem. We hope that the methods we employed will apply to, and serve as an example for, other small-scale organic farms.

OBJECTIVES

1. Assess the baseline level of biodiversity.
2. Build habitats to attract pollinating insects.
3. Build habitats to attract natural predators of agricultural pest insects.
4. Design and implement infrastructure to encourage these pollinating insects and natural pest predators.

REPORTING

We began by conducting a survey of the cultivated and bordering land in order to summarize the species of plants, insects, and other fauna that make up the farm's ecosystem. This list included endemic pest insects (such as the Crucifer Flea Beetle and Imported Cabbageworm), as well as pollinator- friendly native plants (such as Goldenrod and New England Aster). From this knowledge base, we were able to research other native plants that would further enhance the ecosystem. We chose plants such as Wild Bergamot and Yarrow as habitat components that, when introduced and established, will attract certain pollinators or predators of pest insects.

We followed organic agricultural methods in our efforts to control pests, attract pollinators, and plant beneficial plants. We built a bee hotel and a bat house in order to house pollinators and improve insectivorous pest control respectively, and used untreated scrap wood in the construction of both. We also designed a pond to be installed in an area determined by the natural topography and drainage of the farm. Next, we acquired seeds from local farmers to grow pollinator and predator-attracting flowers such as Milkweed and Calendula. Finally, we have compiled a report of our findings (i.e., species lists, descriptions, and relationships) and recommendations (regarding implementation and maintenance) to be given to Common Ground for future reference. All of these biodiversity enhancement strategies may be employed and observed further to measure their efficacy over successive seasons.

COLLABORATORS: Support from the owner of Common Ground Teaching Farm, Dr. Michael Mikulak, and non-academic supervisor Kate Whalen, Senior Manager of Academic Sustainability Programs. Notable mention goes to Michael Mikulak and Laura Anderson for providing aid and assistance while implementing changes to the farm, and Julia Hitchcock for sharing her seeds, plants, and stories with us.

STUDENT ATTITUDES TOWARDS FOOD WASTE

STUDENT AUTHORS:

Komal Aryal, Aqsa Arshad, Mackenzie Kretz, Nikhil Kumar & Pauline Varona

OVERVIEW

In this era of urbanization and unprecedented population growth, waste production and management is a pressing concern. In particular, food waste is a colossal issue, with almost one-third of the food fit for consumption wasted annually.[1] Canada is one of the worst offenders when it comes to this, with roughly $31 billion of food thrown out each year.[1] It is important to understand where students stand on this matter, as they are part of the next generation, and the ones who will ultimately face the consequences of these issues. As such, this project focused on high-school and university students within Halton Region to determine their opinions on food waste. Specifically, we wanted to identify demographic differences, and critically examine potential downfalls to proposed solutions. This was done by conducting a survey with the target audience to gather feedback for further analysis.

OBJECTIVES

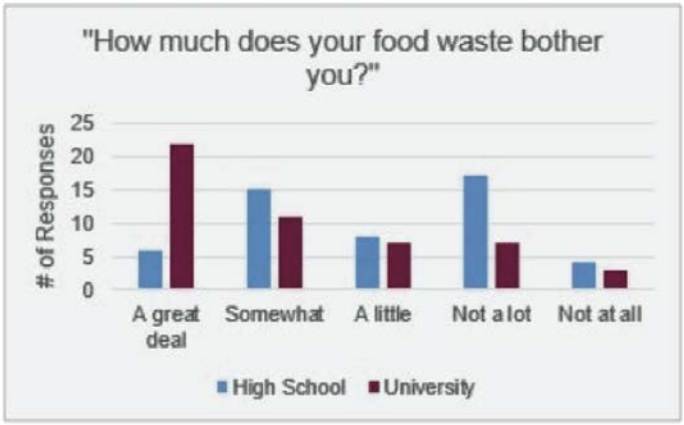
1. Identify attitudinal differences between different demographic groups on the topic of food waste.

2. Determine potential barriers against the implementation of food waste reduction programs among consumers.

3. Educate consumers about food waste production issues, as well as reduction strategies.

REPORTING

The survey was conducted in person using paper copies for high school students, and an electronic version for university students. We were able to meet our target of 50 responses from each group, allowing us to move forward with the data analysis to identify attitudinal differences between Robert Bateman High School and McMaster Ron Joyce Center students. One immediate observation is that the majority of responses from both groups claimed to waste up to or less than 19 percent of food on a weekly basis.



Of this, high school students believed that leftovers comprised most of their food waste. University students felt similarly; however, they believed that fruits and vegetables were equally wasted. One significant difference between the two demographics was with regards to their attitudes towards household food waste. It was reported that 44 percent of university students said that it caused them a great deal of discontent, whereas only 12 percent of high school students felt the same. In spite of this, both groups only made 'somewhat' of an effort to cut down on the amount of waste they generate. The two sets agreed that the biggest reason for food waste generation is due to food being forgotten in the fridge. In order to overcome food waste as an issue, both demographics felt that the best strategy would be to use conscientious.

COLLABORATORS: Special thanks goes to our Community Project Champion, Anna DeMarchi-Meyers, Agricultural Liaison Officer at Halton Region, for providing guidance and mentorship instrumental to our group's success. Our project would not have been possible without her approval and feedback. As well, we thank Shannon Bowden, Head of Math and Science at Robert Bateman High School, for connecting us to students to take part in our survey.

1 Gooch, M., Felfel, A., & Glasbey, C. (2014, December) Food Waste in Canada – $27 Billion Revisited. Value Chain Management Center. Retrieved from http:// vcm-international.com/new-report-annual-food-waste-in-canada-is-31-billion/

SUPPORTING THE FORMATION OF CYCLE HAMILTON

STUDENT AUTHORS:

Miranda Babbitt, Christine Luu, Janine Sziklasi, Kelly Yeung & Syed Zaidi

OVERVIEW

Cycle Hamilton is a community group that emerged in the spring of 2015 to meet the demand for a coordinated effort to advocate for a bike-friendly Hamilton. Cycle Hamilton's vision is to increase the amount of safe, confident, and knowledgeable cyclists in Hamilton by promoting better infrastructure and developing partnerships with organizations, community groups, and citizens. The aim of this project was to assist in the development of Cycle Hamilton as a sustainable community organization with a clear direction. The first step of the project was developing a workshop to obtain feedback from community members about what they would like to see Cycle Hamilton address. The second step of the project was producing a one-year action plan for Cycle Hamilton that integrated this community feedback into a clear set of objectives.

OBJECTIVES

1. Raise awareness by informing the community about Cycle Hamilton's vision of a bike-friendly Hamilton and its goal to support and educate both citizens and policymakers on cycling-related topics.

2. Integrate the input from the cycling community to steer the organization in a direction that the citizens of Hamilton believe is most in line with the community's vision.

3. Assist in the formation of Cycle Hamilton as a sustainable, non-profit, community organization by developing a clear set of objectives that will support their first year of operation.

REPORTING

In order to achieve Objectives 1 and 2, we developed and held a workshop for Cycle Hamilton on November 11th, 2015. This focused the direction of Cycle Hamilton's priorities for the upcoming year through roundtable discussions on a number of infrastructure, societal, and organizational issues for cyclists. There were 37 attendees, who were stationed at tables with discussions facilitated by Cycle Hamilton members. We recorded the discussions between the attendees, who were largely vocal and engaged with the issues at hand, and also provided alternative modes of feedback through a concurrent Twitter campaign and follow-up survey.

The data collected at the workshop informed Objective 3. We developed a comprehensive action plan, The Sustainable Formation of Cycle Hamilton: One-Year Action Plan, which incorporated community feedback from the workshop into a set of objectives to help direct and organize Cycle Hamilton. The plan includes a brief review of the workshop and suggested priorities for the coming year. Lastly, we included potential projects that future SUSTAIN 3S03 students could work on in partnership with Cycle Hamilton.

COLLABORATORS: We worked closely with Cycle Hamilton to develop the topics discussed at the workshop and reported on them in The Sustainable Formation of Cycle Hamilton: One-Year Action Plan. We would like to thank Cycle Hamilton, workshop attendees, and our Community Project Champion, Dave Heidebrecht, for the extremely valuable support.

SustainableJoes EdTEAM

STUDENT AUTHORS:
Ashley Darch, Andre Marini, Melina Ralph & Hayya Usmani

OVERVIEW

In collaboration with SustainableJoes, a module series was created to complement SustainableJoes' current documentary project. This module series ensures "student-centred" learning through a topic centred interactive framework, which incorporates interviews with sustainability experts and concept illustration. The EdTeam's intention is to enable professors to easily implement sustainability focused curriculum into their classrooms that is educational, engaging, entertaining, empowering, and makes sustainability easy for 'all everyday Joes'.

OBJECTIVES

1. From the current hazards and concerns that people are facing, to the practical solutions individuals and communities are implementing, this module series is meant to educate young adults in how sustainability looks today.

2. To spread sustainability awareness in such a way that it becomes realistic and attainable for everyday individuals.

REPORTING

EdTeam began by meeting SustainableJoes' founder, Stephen Szucs, to identify the goals for the project. Four modules were identified and agreed upon for the EdTeam's focus: Sustainability at Large, Water and Wastewater, Sustainability and Business, and Good Governance. Following this, preliminary investigations were conducted into the Ontario grade 11 and 12 curriculum. This allowed the team to identify the baseline of the sustainability knowledge young adults would have prior to viewing the modules. Further investigations were conducted to identify the optimum methods of educational practices. It was discovered that a "student- centred" learning approach and visually rich content would be required to insure SustainableJoes' message was properly received.

From there, The EdTeam moved on to creating the four modules, beginning first by watching the raw footage of the SustainableJoes documentary. Templates were then created for each module. These templates identified key themes, topics, concepts, and interviews that each module would need to contain. As superior quality would be required for each module to ensure a professional look, Stephen was provided a list of businesses and schools that could complete this task.

COLLABORATORS: We would like to thank Stephen Szucs, founder of SustainableJoes, for the opportunity to work on this module series.

SustainableJoes: Making Sustainability Easy

STUDENT AUTHORS:

Alexandra Crone, Nicole Vandenheuvel, Samantha Wright & Christine Yachouh

OVERVIEW

SustainableJoes is an organization founded by Stephen Szucs with the goal of making sustainability easy for "everyday Joes." In December of 2015, SustainableJoes is releasing a documentary as a part of an edutainment series in hopes of making make sustainability more accessible and understandable. This portion of the project coordinated a marketing campaign to promote the release of the SustainableJoes documentary and their new Clear Conscience Card initiative. The majority of our marketing campaign relied on creating a social media presence through websites such as Twitter and Facebook. Our goal was that through creating a social media presence we would be able to promote the ideals of SustainableJoes while simultaneously helping to educate people on how to live more sustainably. This social media campaign was important for advertising the SustainableJoes project but more so for creating a dialogue online among social media users about what it means to be sustainable.

OBJECTIVES

1. Educate and engage social media users on sustainable life practices.

2. Increase social media presence through the use of hashtags, graphic images and relatable facts to advertise SustainableJoes and advocate for sustainable lifestyles.

3. Continental outreach within the campaign; with a focus on Canada and the United States.

REPORTING

The online campaign took place during the first week of December 2015 and promoted the anticipated release of the SustainableJoes documentary and the new Clear Conscience Cards initiative. Each post utilized eye- catching graphics with sustainability facts and words of encouragement for practicing sustainability. Clear Conscience Cards were used as an incentive to further encourage social media participation and advertise the new project. Followers who reached out to SustainableJoes accounts and utilized the campaign's hashtag #SustainableU were entered to win free Clear Conscience Cards. During the week of the campaign there were drastic increases in social media compared to the month prior. Furthermore, over 100 Clear Conscience Cards were sold during the week of the campaign. The social media campaign helped to educate social media users on sustainable life practices by directing them to resources on sustainability, and was monitored by the amount of engagements on SustainableJoes posts.

Behind the scenes photo taken from SustainableJoes social media interview with Captain Paul Watson, which will be featured in the documentary. Seen interviewing the Captain are Stephen Szucs and Samantha Wright

COLLABORATORS: Special thanks goes to Community Project Champion, the founder of SustainableJoes: Stephen Szucs for providing information, support, and mentorship; our Education Team: Ashley Darch, Andre Marini, Melina Ralph, and Hayya Usmani and our Academic Sustainability Programs Office liaison: Kate Whalen.

WASTE MANAGEMENT AT MCMASTER MEDICAL CENTRE

STUDENT AUTHORS:

Negin Balaghi, Zaki Bayat, Christian Monti, Mansi Patel & Hiba Shah

OVERVIEW

The perioperative services department at McMaster University Medical Centre (MUMC), comprising of the operating room (OR), same day surgery (SDS), post anesthetic care unit, and the pre-operative clinic, is a large generator of unique recyclable materials. One of the main criteria in recycling is to avoid mixing non- recyclables and recyclables into a recycling container, otherwise all recyclables are considered contaminated and cannot be handled in accordance to the legislation and disposal standards. In order to address this principle and to discretely address the concerns of the staff regarding recycling practices in the perioperative services department, a unified poster was required to be designed and distributed across all wards within the perioperative department.

OBJECTIVES

1. Identify existing gaps in effective recycling practices at MUMC perioperative services department compared to leading healthcare systems in Ontario

2. Propose solutions for improvement, with a focus on proper recycling education

3. Develop an effective mode of communication to educate and relay information about sustainable recycling practices

4. Conduct pre and post implementation visual recycling reviews and analyze the impact of the new communication plan in improving proper recycling habits

REPORTING

In the first phase of this project and in order to assess the status of recycling practices prior to implementing any changes at the site, our team conducted interviews with four main categories of staff in contact with the perioperative services department waste generation and handling. After gathering initial information from nurses, environmental aides, health care aides, and waste operator site lead, an initial visual audit was compiled to study the quantity, nature, and composition of the recyclable materials generated in the four areas of focus in the hospital and to understand how this recycling is being managed. As per our findings, surgeries, therefore the OR and SDS, are known to account for the majority of the waste produced by the hospital per unit operation. In order to ensure a sustainable change to recycling practices, we designed and implemented a unified poster, addressing primarily the materials handled in the perioperative service department of the hospital.

By presenting the poster to the wards within the perioperative services, we were able to play a part in increasing awareness among staff about existing waste disposal issues, engage the team in identifying the most beneficial solutions and discuss available improvement opportunities as part of future phases of our project. During our final visit of MUMC in December, going through a number of recycling bags, we noted correct identification of a lot of recyclable items in comparison to the samples collected previously. Upon the success of this project and with the recommendations presented in the project report, we hope to see enhanced recycling equipment (e.g. visible recycling bins with proper lids in place, unified clear bags, etc.) across HHS in the near future.

From left to right – Mansi Patel, Rosemary Van Oostrom, Sandy McLean, Negin Balaghi

COLLABORATORS: Much appreciation goes to our project champion, Rosemary Van Oostrom, Waste Management Coordinator of the Hamilton Health Sciences team for her constant support and guidance throughout this project. Special thanks to Sandy McLean, our amazing clinical leader for her mentorship and support.

SUSTAINABILITY INTERNSHIP PROGRAM

SUSTAINABILITY INTERNSHIP PROGRAM

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

OBJECTIVES

The objectives of the Sustainability Internship Program are as follows:

- Engage all Faculties in working together to provide opportunities for undergraduate students to gain academic credit for experiential learning.
- Support 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 been expanded each year for the past seven years and has supported more than 100 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. Past reports can be found at asp.mcmaster.ca/reports.

COLLABORATORS

The Sustainability Internship Program is made possible through collaboration with faculties from across campus 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.

YEAR IN REVIEW

During the initial years of the Sustainability Internship Program, students gravitated towards projects that had been previously identified and presented as possible opportunities, similar to how a graduate student would approach a research supervisor to assist with or lead a portion of a larger study. In recent years, a shift has taken place whereby students are approaching their sustainability internship with a problem or research question already in mind. This is certainly a positive evolution for the program and for sustainability education as a whole. As a result of this shift, the role of the Academic Sustainability Programs (ASP) Office is also changing to ensure students are supported in their self-directed experiential learning. Valuable learning is taking place through this form of student-directed inquiry, which can be further enhanced if the appropriate time, resources, and supports are in place for students who choose to engage in this type of education. The ASP Office has and will continue to work with students, faculty, staff, and the broader community to ensure that all programs offered by the Office continue to evolve in line with the supports required for student learning.

OBJECTIVES

The objectives of the program are as follows:

- Foster collaborations with departments across campus to support student-directed learning.
- Develop resources to support student-directed learning and inquiry.
- Provide opportunities for mentorship throughout the student's learning process.

REPORTING

This past year, three students took part in the Sustainability Internship Program. Two students were from the Faculty of Engineering and one student was from the Faculty of Business. As you will read in the pages to follow, each student identified a specific sustainability problem and their associated research question. All students required two full academic terms to successfully complete their project, which included weekly meetings and support from multiple stakeholders.

REPORTING (CONTINUED)

Each of the two Faculties, which provide academic credit to the student for successful completion of their project, offered students the opportunity to work on their experiential learning project over two full academic terms, which was beneficial for student learning and project implementation. This flexibility is extremely valuable for students whose projects are dependent on a particular season, need to align with a community partner's schedule, or require Ethics approval, to name a few examples. Future development of the Internship Program will include continued work with each Faculty's experiential education office, as well as departments such as Student Success Centre and McMaster Research Ethics Board. Through collaboration, we can connect sustainability-focused student-directed education with existing resources by encouraging students to utilize University assets to support their learning.

THIS YEAR'S COLLABORATORS

The individual student interns designed, developed, and created fantastic work through their self-directed learning. Integral support was provided by the student's home Faculty, their academic advisors, Community Project Champions, and project mentors. Additional support from University departments, including the McMaster Research Ethics Board, ensured the students were well supported throughout their research and in obtaining essential skills for project development and implementation.

THE DIVERSION DILEMMA

SUSTAINABILITY INTERN: BRYAN WILLIAMS

Chemical Engineering & Society, Faculty of Engineering

OVERVIEW

At the turn of the century, the City of Hamilton was faced with a serious threat to the longevity of it's only operating landfill. In an effort to prolong the landfill's operational life, the City focused on increasing waste diversion and was able to more than double its diversion rate in less than a decade, from 17% in 2000 to 44% in 2008 (Colangelo, 2016). Following this initial success, the City's annual diversion rate has been maintained, with a slight increase of 4% between 2008 and 2015. With a growing population and availability of consumer products, dealing with the waste produced within cities is becoming a serious challenge for many municipalities. Fascinated by the complex interactions that occur between the public and the municipality when dealing with waste management, I approached this project with the goal of identifying ways in which the City of Hamilton and its residents can work to increase waste diversion and reduce their overall waste footprint.

OBJECTIVES

- Develop a thorough understanding of the City of Hamilton's waste management strategy.
- Compare the City of Hamilton's waste management strategy to other municipalities.
- Work with the City of Hamilton on possible strategies for improvements to waste management, with a focus on waste reduction.

SUSTAINABILITY INTERN: BRYAN WILLIAMS

Chemical Engineering & Society, Faculty of Engineering

REPORTING

Through my research, I identified a variety of metrics used to measure the success of waste management programs. Two of the most common measurements include: waste diversion, the total amount of waste diverted from landfill, divided by the total amount of waste produced; and total waste, the total amount of waste produced including garbage, recycling, organics, etc. Best practices of other municipalities show that a focus on total waste reduction, rather than waste diversion, is more effective at achieving long-term success (Province of Ontario, 2015; Recycling Council of British Columbia, 2016). Waste diversion can be used as an initial strategy to reduce waste going to landfill, however increased diversion rates do not necessarily mean decreased waste production. To this point, a city could increase total waste generated but put most of the products in the recycling bin, and still see an increase in waste diversion. To focus on the deeper issue of the total amount of waste in our society, my main recommendation would be to focus on total waste reduction, rather than waste diversion. Through my findings, and in working with the City of Hamilton, my recommendations are as follows:

1. Shift waste management strategies from waste diversion to total waste reduction.
2. Work to form more active relationships with the commercial entities within the city that contribute to waste production.
3. Utilize direct contact with the public as a means to educate citizens about waste reduction.

These recommendations are meant to encourage the City to address the greater issue of total waste production while still enabling them to keep increased diversion rates as a target.

PROJECT COLLABORATORS

This project would not have been possible without the support of staff members of the City of Hamilton Public Works Department, who provided information, support, feedback, and multiple opportunities to discuss ideas, as well as to present findings and proposed solutions.

Sources:

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THE FOOD COLLECTIVE

SUSTAINABILITY INTERN: DAVID CHENG

Commerce, Faculty of Business

OVERVIEW

Mac Bread Bin is McMaster's food bank service, which is a service provided through the McMaster Students Union (MSU) with the mission to support students, staff, alumni, and Hamilton community members facing food insecurities. Bread Bin's story began more than a decade ago when post-secondary institutions witnessed a mobilization of student organizations developing strategies to address food security issues on campuses. Traditionally, Mac Bread Bin offers a service where partners* submit an order online for food and/or hygiene products, which are then placed in designated lockers for anonymous pick up. This operation is referred to as Lockers of Love (LoL).

In 2015, Mac Bread Bin initiated a grocery store food bank model that is being referred to as the Food Collective Centre (FCC). The FCC provides a space for Mac Bread Bin partners to physically pick and choose food and hygiene products as they would in a retail store.

The purpose of this project is to support Mac Bread Bin to better understand the factors that influence partners' decision to access either the FCC or LoL, and to ultimately improve the overall service.

OBJECTIVES

- Prepare a literature review of peer-reviewed academic studies pertaining to post-secondary and community food banks in Canada.
- Conduct a survey for Mac Bread Bin partners about their feelings and opinions towards the grocery store food bank model (FCC) and anonymous locker pick-up (LoL).
- Utilize survey data to improve Bread Bin's service.
- Share findings with stakeholders such as Mac Bread Bin partners, Mac Bread Bin Executive Team, MSU Executive Board, and MSU Services Committee.

*The term "partners" refers to members of the community, including students, staff, alumni, and members of the Hamilton community that the Bread Bin supports.

SUSTAINABILITY INTERN: DAVID CHENG

Commerce, Faculty of Business

REPORTING

Through reviewing literature and best practices from other institutions with similar programs, I led the development a survey that would help us understand the needs of Bread Bin's partners and enhance Bread Bin's service by aligning with their partner's needs.

The survey was approved by McMaster's Research Ethics Board and was conducted in three phases over an 11-month period between November 2015 and August 2016. The survey findings resulted in recommendations that were able to be implemented right away. The three key findings are as follows: (1) survey data showed that most respondents preferred the Lockers of Love (LoL) model for the main reason that it was fully confidential. However, it was noted that a large draw to the grocery store food bank (FCC) model was that it provided partners the freedom to choose specific items they needed. These results show that confidentiality and flexibility are both important factors, offering support for both the LoL model and the FCC model; (2) with respect to FCC hours of operation, partners noted that they would prefer to have open hours that allowed them to drop-in at their convenience, rather than having to schedule an appointment. As a result, Bread Bin was able to revise FCC operation by moving from an appointment-based system to offering drop-in office hours from Monday to Friday; (3) partners were generally in favour of access to more fresh food items. However, it is not feasible for Mac Bread Bin to offer fresh foods in either model. As an alternative solution, Mac Bread Bin provided a discount to the Good Food Box program for their partners, which enabled them greater access to fresh food items.

A full report of the service enhancements, as well as future recommendations will be made to Mac Bread Bin partners, Mac Bread Bin Executive Team, MSU Executive Board, and MSU Services Committee in October 2016.

PROJECT COLLABORATORS

Integral support for this project has been provided by the following individuals: Brent McKnight, Assistant Professor, DeGroote School of Business; Chad Harvey, Teaching Professor, Honours Integrated Science Program/Biology; Kate Whalen, Senior Manager of Academic Sustainability Programs; and Adriane Pong, Good Food Coordinator (Food Collective Centre Coordinator), Faculty of Science.

INQUIRY ON GRAFFITI & STREET ART

SUSTAINABILITY INTERN: JONATHON TONIETTO

Materials Engineering & Society, Faculty of Engineering

OVERVIEW

The focus of my final year Inquiry project was to develop an answer to the central question, Why is there not more appreciation for art in the public realm? Throughout the initial challenge of deciphering the difference between graffiti and street art, I learned about the long and fascinating history of graffiti. Graffiti dates back to Roman civilizations, but it was the hip hop movement in New York City that really shined a light on graffiti as form of art (Newitz, 2011). Art is a means through which individuals can express themselves, display their emotions and feelings, and connect with others. Art and culture are key aspects of vibrant societies, and society is fundamental for social, environmental, and economic sustainability. Our socially constructed perception of graffiti can let us see illegal scrawling or artistic murals. We can change our perspective to allow us to see that graffiti can give a city character and enhance the aesthetic beauty of an urban space. Graffiti, street art, and other forms of art presented in the public realm, can help create a sense of place in our built environment. These forms of art can promote identity, pride of place, and happiness. In these ways, graffiti and street art can help to create vibrant societies that are necessary for sustainability.

OBJECTIVES

- Research and identify the origin of graffiti and street art, while investigating the stereotypical geographic areas they would presumably be found.
- Explain how engineers can play a role in supporting graffiti and street art in the built environment.
- Understand how graffiti and street art can advance social sustainability.

SUSTAINABILITY INTERN: JONATHON TONIETTO

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REPORTING

During this project, I found that there has been graffiti since the dawn of civilizations. The ancient city of Pompeii, near Naples in Italy, provides examples of how Roman civilizations used graffiti to highlight specific individuals in the city, such as gladiators, politicians, and even prostitutes (Newitz, 2011). Modern graffiti evolved from the "tag" in New York City during the 70s and 80s where individuals used markers and house paint to create vast murals. With the engineering invention of the aerosol spray can, artists had access to a medium that was portable and allowed for the blending of colours in a distinct way.

Engineers play a significant and important role in city building, and they can influence the sustainability of urban environments. Art in the public realm could be incorporated when planning the design of new buildings. For example, non-porous materials can be utilized that would allow paint to stick to the surface without fading the pigment. Incorporating graffiti and street art into the design of urban infrastructure can enhance the aesthetic and help present them as intentional contributions to the space, helping to improve the perception of how these forms of art are viewed.

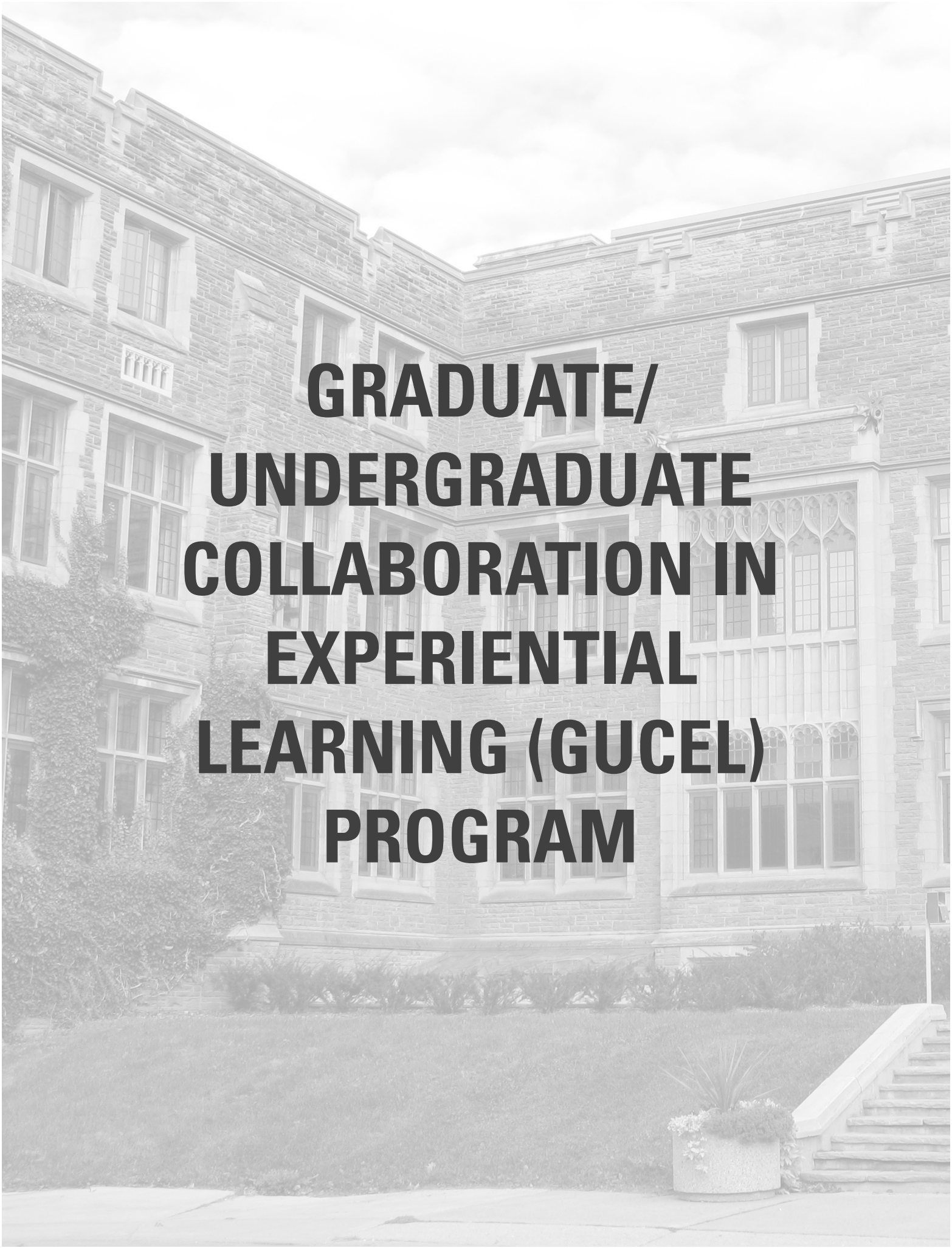
Social stigma towards these art forms is changing in some cultures. In Bogota Colombia and Melbourne Australia, mural art, including graffiti, is welcomed by the community. These art forms are used to promote culture and explain their history, without charging people money to see it. In this way, art is being used to promote sense of place and community engagement.

Since concluding this project, I have connected with a local charity for at-risk youth about leading workshops about art. Through this initiative, I hope to teach young people about public art and graffiti, as well as how to properly engage with cities to share artistic work. Part of my work to engage youth in this effort has included collaboration with individuals and groups in Hamilton and Toronto about creating murals on various establishments. This project has helped me develop a personal passion for art and gain a deep appreciation for the role it can play in creating vibrant and sustainable societies for all to enjoy.

PROJECT COLLABORATORS

I would like to thank Kate Whalen for all of her support throughout my experiential learning process. She was an amazing mentor and gave me complete creative control of this project, offering guidance and support throughout. I would also like to thank Brian Baetz, Cameron Churchill, and Joey Kish who have supported my personal and professional development, giving me the knowledge and confidence to complete an Inquiry project that was truly meaningful to me. Finally, I would like to thank my friend AKWD (his graffiti tag) for introducing me, first-hand, to the unique subculture of graffiti.

Sources:
Newitz, A. (2011, 7 29). The Lost City of Pompeii: Pictures of an Alien World, Frozen in Time. Retrieved from io9 we come from the future: http://io9.gizmodo.com/5825459/the-roman-city-of-pompeii-pictures-of-a-lost-world-frozen-in-time



GRADUATE/ UNDERGRADUATE COLLABORATION IN EXPERIENTIAL LEARNING (GUCEL) PROGRAM

Graduate/Undergraduate Collaboration in Experiential Learning (GUCEL) Program

The GUCEL Program encourages graduate and undergraduate students to work together on an interdisciplinary project, resulting in the creation of novel intellectual communities. This dynamic interaction facilitates the development of an intellectual community through the exchange of ideas, knowledge, and perspectives. Furthermore, students have the opportunity to expand their existing intellectual community to include individuals from across campus, representing a variety of disciplines and levels of study.

OBJECTIVES

The objectives of the GUCEL Program are as follows:

- Enhance the student experience by contributing to an intellectual community and encouraging engaged scholarship.
- Encourage interdisciplinary and multi-level collaboration between graduate and undergraduate students.
- Foster a culture of collaboration among students, faculty, staff, and members of the broader community.

REPORTING

The GUCEL Program is approaching its fourth year of operation. During this time, the program has provided an opportunity for McMaster's graduate students to take part in experiential learning through working with undergraduate students, faculty, staff and members of the community. In three years, the GUCEL Program has supported five students in the Faculties of Business, Science, and Social Sciences. Starting in 2013, all published annual reports from the

REPORTING (CONTINUED)

ASP Office include a full section highlighting the work of students who have successfully completed their GUCEL projects. Past reports can be found at asp.mcmaster.ca/reports.

While there was interest from graduate students in 2015/16, no students formally took part in the GUCEL Program. Recruitment efforts at the graduate level have been enhanced and revised, which has shown initial success and we look forward to reporting on the outcomes in the 2016/17 Annual Report.

COLLABORATORS

The GUCEL Program was developed by past graduate student, Melissa Gallina. The Program would not have been possible without Melissa and the support from the School of Graduate Studies. A special thanks also goes to the students, staff, faculty, and members of the community who have and continue to support the GUCEL Program.

COMMUNITY-BASED LEADERSHIP IN SUSTAINABILITY (CLS)

Community-Based Leadership in Sustainability (CLS)

The 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 hope that through this initiative, connections were made, and new ideas generated that may provide benefit to the City a whole. One of the main objectives of the CLS initiative was to offer these educational and networking events without barrier. 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

In the two years since its launch in 2014, there have been seven events in total, all of which have been hosted at local and accessible locations. Through these events, we have engaged over 700 individuals, 29 speakers, and 92 volunteers. Through effective community engagement, collaboration, and the generosity of program donors, nearly $19,000 in funding has been raised.

PROGRAM COLLABORATORS

The CLS initiative is a product of the hard work and dedication from the Hamilton Sustainability Professionals Network Executive Board members; 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.

*To ensure attendance, a $10 deposit was put in place for the Green Jobs event. All those who registered and attended, were refunded their deposit.

YEAR IN REVIEW

Building off of the initial success of the CSL initiative, a new focus for the 2015/16 series was placed on attendee engagement through active participation. This was a shift from the initial approach focused on engaging a diverse set of speakers to provide their unique perspective on a specific sustainability topic, which ultimately resulted in a lecture-style approach. The main form of participant engagement during the first year's events was through a dedicated time for networking following the speaker portion of each event. One of the main challenges identified in the revised approach was that development and implementation would require a much larger investment in time and resources. As such, the group focused on a smaller number of events to help ensure continued success.

OBJECTIVES

- Ensure each event maintains a focus on participant engagement through active participation.
- Engage new collaborators to help provide opportunities for active participation.
- Maintain initial success for event attendance and positive participant feedback.

REPORTING

Through the summer of 2015, the CLS working group formed a partnership with Virtual Hamilton to plan an event that would enable community members to explore the challenges and opportunities of complete and liveable street designs through active participation. The event, which took more than four months of dedicated planning and development, was delivered twice to different audiences. The first event, held on the evening of Thursday, October 1st, was presented as a CLS event and was hosted at the Art Gallery of Hamilton. The second event was a concurrent session of the annual HIVEX young professionals conference, which was held during the day on Saturday, October 31st. During the events, participants were able to re-envision streets chosen in five Hamilton neighbourhoods through the use of maps and two-dimensional street elements, including bike lanes, green space, and park benches. In addition to the tactical maps, there was also an opportunity for participants to engage with Virtual Hamilton's virtual world where they could see and re-design the same Hamilton streets in a virtual 3D environment. Over 250 people attended the Complete Streets events, and support was provided by 6 speakers and 14 volunteers.

REPORTING (CONTINUED)

The third CLS event was the third annual Green Jobs Networking event, which was held on the morning of Thursday, April 8. The event was supported by keynote speaker Liz Neild, CEO of LURA Consulting who took event attendees through a series of short activities focused on finding your passion, getting involved, and making the most of your experiences. Following Liz's keynote address and before engaging in roundtable discussions between attendees and sustainability professionals, each of the 13 professionals introduced themselves and gave a brief overview of their professional role within the field of sustainability and also provided one piece of advice to those looking to enter a career in sustainability. Over 80 people attended the event and the response was extremely positive.

Despite the novel challenges that this new format presented, we were successful in meeting our stated objectives. All events maintained a focus on engagement through active participation. New collaborators included Virtual Hamilton, various Hamilton neighbourhood associations, We Are Cities, and the Network for Campus and Community Partnerships. Also, positive participant feedback was maintained and in some areas was enhanced. Through a follow-up survey we found that 42% were Very Satisfied, 49% Satisfied, and 9.5% Neutral. No respondents reported being Dissatisfied or Very Dissatisfied. Furthermore, 51% of responses mention interactive components as something they enjoyed most. Finally, 98.4% said they would attend another CLS event in future. A full reporting of the 2015/16 CLS series can be found at asp.mcmaster.ca/cls. We look forward to further enhancing this new approach to CLS during the 2016/17 series.

THIS YEAR'S COLLABORATORS

We would like to thank the Hamilton SPN Executive Board members who make up the CLS working group; various individuals and departments of McMaster University, who also provided financial support, including the Network for Community and Campus Partnerships, Virtual Hamilton, W. Booth School of Engineering Practice, Alumni Association, and Student Success Centre; our volunteers, speakers, and neighbourhood and community leaders; the HiveX planning team; the many additional collaborators who provided financial or in-kind support, which include the City of Hamilton's Economic Development Department, We Are Cities, Smart Commute Hamilton, The Art Gallery of Hamilton, Grand & Toy, OPIRG McMaster, and Sustainable Hamilton-Burlington. Last, but not least, we thank the engaged community members who supported the initiative through attending and investing in a sustainable Hamilton through active participation in these events.

McMaster University

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