Undergraduate student perceptions of a university's sustainability practices and insights to improve them

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Abstract

Sustainable practices are important to ensure peace and prosperity for people and the planet now and in the future, (United Nations, n.d.). Universities are well equipped to promote sustainability through campus operations and by empowering students to act and become involved. Due to students' extensive firsthand experience on campus and knowledge of its operations, their perspectives are invaluable in evaluating current practices and providing direction for sustainable action at universities. The goal of this study was to gather student perspectives on McMaster University's sustainability efforts to inform the development of the university's first sustainability strategy. We interviewed nine undergraduate students who were knowledgeable about sustainability and had been involved in co-curricular sustainability activities at McMaster. We identified three themes related to steps the university could take to enhance sustainability. These included: 1) McMaster could better promote academic and co-curricular opportunities for student engagement; 2) involving students in decision-making by having more transparency and gaining their perspectives; and 3) connecting sustainability commitments and claims to concrete actions. These findings suggest courses of action to enhance sustainability at McMaster from the perspective of students, and provide insights for other universities to include in their own sustainability strategies.

Introduction

McMaster University is a higher education institution located in Hamilton, Ontario, Canada, and is represented by an incredibly diverse student body. In the 2020-21 academic year, the student population consisted of 36,449 students who came from a total of 120 countries (McMaster University, n.d.a). McMaster has also placed 80th within the Times Higher Education World University Rankings for 2021, as well as 14th in the Times Higher Education Impact Rankings for 2021, the latter of which recognizes sustainability efforts based on the United Nations' Sustainable Development Goals. As such, McMaster possesses a significant opportunity to spearhead the realm of sustainability and is already home to a high number of students involved in and passionate about sustainability.

There is currently a strong movement for universities to establish strategies and organizational principles that align their practices with sustainability (Soini et al., 2018). As institutions tasked with educating future leaders, universities are in a strong position to promote sustainability, raise awareness, and empower students to become involved (Nejati & Nejati, 2013). Furthermore, universities can leverage their resources to implement sustainability initiatives that can benefit local and broader communities. Recognizing this, McMaster's Office of Sustainability is currently developing the university's first-ever sustainability strategy, which aims to guide future sustainability efforts and "integrate environmental, social, and economic sustainability themes across many aspects of [the university]" (McMaster University, n.d.b).

Spangenberg (2011) asserts that in the pursuit of sustainability, research must cross disciplinary boundaries and involve all stakeholders. In particular, it is important for students to be consulted in the development of university sustainability strategies because they possess extensive firsthand experience on campus and knowledge of its operations. Therefore, their perspectives are invaluable in evaluating current sustainability practices and producing insights for future efforts (Nejati & Nejati, 2013).

Nejati and Nejati (2013) investigated which factors contribute to a sustainable university by administering a survey to students in a Malaysian University. Based on findings, a reliable scale was developed to assess the sustainability practices of universities from the perspective of students. It included four key areas: 1) community outreach; 2) sustainability commitment and monitoring; 3) waste and energy; and 4) land use and planning. Pop et al. (2020) conducted a similar study for students in a Romanian university. Four main areas were identified to assess the sustainability degree of a university, including: 1) education; 2) research; 3) community involvement; and 4) the reduction of campus activities' impact on the environment.

Dagiliute et al. (2018) investigated differences in students' perceived sustainability between a 'green' and a 'non-green' university in Lithuania. In general, major differences were not discovered, however, students from 'green' universities tended to seek out more information about sustainability and were more involved in sustainability activities. The researchers also found that students perceived social aspects such as social well-being and tolerance as more important than environmental aspects such as energy saving and reducing environmental impact.

Nagy and Somosi (2020) examined student expectations and satisfaction with university sustainability efforts. The results of an online survey conducted in Hungary showed that students considered Hungarian universities unsustainable, with areas for improvement in sustainable purchasing and renewable energy use. Conversely, separate waste collection and the location of campuses in a green environment were identified as strengths. These four areas were considered most important for students.

These studies provide interesting insights from students that can help universities develop sustainability frameworks. However, these findings are context-specific and cannot be generalized to all higher education institutions. Recognizing that student perspectives are critical for the implementation and success of sustainability strategies, this study aims to understand how McMaster could enhance campus sustainability from the perspective of its students and use this knowledge to inform the university's sustainability strategy. In this paper, we present courses of action that McMaster could incorporate into their sustainability strategy, identified via thematic analysis of interviews with nine McMaster undergraduate students.

Methods

Overview and Participation

This study aimed to understand McMaster undergraduate students' perspectives on campus sustainability to inform the development of a university-wide sustainability strategy. For this study, following approval from McMaster's Research Ethics Board (Project ID: 5721), students were recruited from the Student Sustainability Ambassadors Program (SSAP) via email and social media posts by a member of McMaster's Academic Sustainability Programs Office (ASP) on behalf of the researchers. SSAP is a community of like-minded students interested in sustainability at McMaster, with the goals of promoting sustainability initiatives and increasing collaboration between student-led sustainability clubs and groups. Students were recruited from SSAP due to their extensive knowledge of McMaster's sustainability efforts through their involvement in co-curricular sustainability activities at the university. This study also aimed to primarily recruit

upper-year (third year and above) students, as they would have had more experience on campus and awareness of sustainability practices and initiatives.

Initially, a recruitment email was sent to all SSAP members by a member of the ASP Office. This email included the project overview, as well as the Letter of Information and Consent (**see Letter of Information and Consent in Appendix A**). In addition, recruitment posts were made in the SSAP Facebook group. After two recruitment emails and social media posts, nine members agreed to participate in a one-on-one, semi-structured interview, approximately forty-five minutes long. There was no exclusion criteria applied to participants' major, such that participation from all of McMaster's six faculties and the Arts and Science Program was encouraged. Among the nine participants, eight were in an upper year (third year or above), and one was in their second year. All interviews took place in November and December 2021 via Zoom (an online audio and video platform). All participants consented to the conditions for the research, which included reporting their data in an anonymous format (i.e., removing names, personally identifiable information, and specific references). Participants were assigned a unique number and received a $10.00 CAD Starbucks E-gift card through their McMaster email at the start of the interview.

Permission was obtained for all quotes included in this report. Additionally, participants were made aware of the potential study risks (i.e., feeling uncomfortable sharing thoughts and feelings, as well as fear that what they share may impact their relationships at McMaster University) and that participation was optional, they were not obligated to share thoughts if they felt uncomfortable, and could stop the interview or withdraw from the study at any time without forfeiting their incentive. This information was provided at the beginning of their interview and in the Letter of Information and Consent. All participants agreed to have their interviews recorded and transcribed via the Zoom platform, with transcripts saved on McMaster's secure OneDrive. Data was only accessible to members of the research team and all transcripts and related emails were deleted from OneDrive on April 1, 2022.

Interviews

During the interviews, all nine participants were asked about their experiences with sustainability at McMaster, as well as for feedback on McMaster's past and current sustainability practices, and suggestions for future sustainability efforts (**see Interview Guide in Appendix B).** All transcripts went through an editing process where punctuation was added to facilitate the analysis process and readability of the text so that it was true to how it was spoken. In these interviews, the peer-to-peer relationship between interviewers and interviewees helped gain honest feedback on McMaster's current practices and ideas for the future.

Thematic analysis

Thematic analysis took place in January and February of 2022. The process for thematic analysis was modelled after Braun and Clarke (2006), who suggest that researchers make several decisions before they begin their analysis. We have outlined our decisions and approach here.

A rich description of the data set was chosen as an approach instead of a detailed account of one particular aspect (Braun & Clarke, 2006). This approach is recommended for under-researched areas and student perceptions of campus sustainability at McMaster were not known before this study. Furthermore, our goal was to obtain a wide range of perspectives from students, rather than focusing on one specific aspect of sustainability.

An inductive approach to thematic analysis was selected over a theoretical one. Inductive analysis involves not fitting data into a pre-existing coding frame or the researcher's analytic preconceptions, whereas theoretical analysis tends to be driven by the researcher's theoretical or analytical interest in the area (Braun & Clarke, 2006). We were interested in gaining the unique perspectives of McMaster students in particular; therefore, the literature was not consulted prior to data analysis to not influence the main themes in any way.

As explained by Braun and Clarke (2006), latent themes go beyond the surface level of the data and dive into underlying ideas, whereas semantic themes look at the data more explicitly and with surface-level meaning. We decided to report semantic themes as this would have helped us more easily identify insights and make recommendations for McMaster's sustainability strategy.

According to Braun and Clarke (2006), an essentialist/realist approach allows for researchers to theorize meaning in a straightforward manner, based on language participants use. On the other hand, a constructionist approach examines the ways events, realities, meanings, and experiences are the effects of factors operating within society, which requires interpretative work by the researchers. We chose to utilize the essentialist/realist approach as this would have better captured student perspectives and experiences objectively.

Once we decided how we were going to approach our analysis, we began by cleaning and re-reading our transcripts to familiarize ourselves with the data. We then began the initial coding process, which involved identifying features of the data which appeared interesting, were related to our research question, and could be assessed in a meaningful way (Braun & Clarke). Following initial coding, we began to code the data for themes, looking for anything that represented what students valued regarding sustainability, their evaluation of the university's sustainability efforts and guidelines, and how the university could improve to become more sustainable. Furthermore, we intended to understand students' common and most important views; therefore, our condition of prevalence for a theme was a concept appearing in more than one interview.

After identifying several themes, all transcripts were uploaded into NVivo software (https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home) to begin formal coding. The key themes were identified based on pertinence to the research question and organized based on the principles of internal homogeneity (coherence within a theme) and external heterogeneity (distinct themes that represent the data set with clear relationships among the themes) (Braun & Clarke, 2006). The three key themes, which are described in the Results section below, were: McMaster could better promote academic and co-curricular opportunities for student engagement, McMaster could involve students in decision-making better by having more transparency and gaining their perspectives, and McMaster could be more accountable by connecting its claims and principles to concrete action.

Limitations

The participants in this study and their perspectives on campus sustainability are not representative of all students at McMaster. Firstly, due to time constraints and the nature of qualitative research, only a sample size consisting of nine participants was interviewed. Secondly, all participants were interested in and passionate about sustainability, which may have resulted different perspectives when compared to the average student. However, McMaster has conducted additional wider-reaching surveys to gain student perspectives of campus sustainability for the sustainability strategy, which will supplement the data from this study.

The key themes presented in this paper are a subset of all themes identified and as such, do not capture the entire dataset. We decided to only report on insights that could guide complex courses of action to enhance sustainability at McMaster, rather than specific areas of improvement, since the surveys conducted by McMaster already seek to gather this information.

Results

Our study aimed to understand how McMaster could enhance campus sustainability from the perspective of students and use this knowledge to inform the university's sustainability strategy. From our analysis, we identified three major themes centered on courses of action that McMaster could incorporate into their strategy. These include: 1) better promoting academic and co-curricular opportunities for student engagement; 2) involving students in decision-making by having more transparency and gaining their perspectives; and 3) connecting sustainability commitments and claims to concrete actions. These findings are displayed in Figure 1. In addition, there were certain topics that were often mentioned in regard to theme three, including waste management and divestment, which were referenced 47 and 30 times respectively and across all nine interviews. However, for the reasons described under the Limitations section, we have decided to focus on broader approaches, rather than on specific areas for improvement.

Theme 1: McMaster could better promote academic and co-curricular opportunities for student engagement.

The participants expressed their desire for more information about opportunities for academic and co-curricular engagement. Participants also described their general lack of awareness for the various sustainability initiatives and engagement opportunities on campus, pointing to the limited promotion of these opportunities by the university. This theme was referenced 26 times and in seven of the nine interviews.

Student #2 described that they became inspired and began seeking opportunities to get involved in sustainability through their own research. Initially, their only exposure to sustainability on campus was seeing the reusable container program in a residence cafeteria, but once they became involved, they became aware of the many sustainability initiatives on campus.

> *"Okay, so it's funny because the way I got involved in sustainability was really sort of on a whim. I emailed [the Academic Sustainability Programs Office Associate Director] because I watched a documentary, and I was mind blown and I was like I need to do something about this. So, I emailed [the Academic Sustainability Programs Office*

Associate Director] and then [they] got me involved with some initiatives in the office. So, I'd say, in my first year, I didn't really think about [sustainability], at all, I think the most that I thought about it was when you go to Centro and you get the green boxes if you're living in residence. But that was pretty much it, and then after getting into the office in second year, it was like bam bam bam, there's this going on, there's this going on, there are thousands of initiatives, but you don't really know about them until you get more involved in the community."

Student #6 described that they would have liked to complete the sustainability minor offered by the university, however, they were unaware of it until they reached their third year, when it was already too late. Student #6 also expressed that they would have liked more promotion for the minor in their first and second years.

"Honestly, one thing that I would have loved to learn about more in first and second year would have been a minor, potentially minoring in something to do with sustainability or sustainable development goals or something like that. Because by the time I kind of figured out, and that was also partially on me because I should have done my research sooner, but by the time I was like oh, this is a possibility, I was already in third year, so I think that would have been too late for me to try and figure out how to do a minor, so definitely more education and information nights, things like that, in first and second year, when people are trying to figure out their paths, would have been really nice."

Student #8 expressed a desire for more sustainability-related promotion and describes that they became involved in sustainability after hearing a professor talk about potential opportunities. Student #8 also remarked that they probably would not have gotten involved if not for that class because they had not seen promotion elsewhere.

"I think just more information about sustainability out there, to be honest, the only reason that I recently got involved in sustainability is because [a professor] had mentioned the projects he was working on and mentioned the minor in sustainability, which really got me looking into everything. That's how I got involved in all these clubs and everything, but had I not taken that class, that little piece of information that got me started, I would have no clue about any sustainability efforts. I don't know. It just wasn't something that I was taught in high school. It wasn't something that I was taught until I was sort of seeking out my own research. I think if McMaster could just have more information out there that's easily accessible for all students, so that it's not something that you have to seek out it's sort of in your face all the time. Yeah, just making sustainability efforts known to everyone."

Theme 2: McMaster could involve students in decision-making by having more transparency and gaining their perspectives

The participants expressed a desire to be more involved in university decisions that impact sustainability. They described a lack of transparency from senior boards and committees and would like them to better gather student perspectives when making decisions. This theme was

referenced 29 times and in all nine interviews. Recommendations to gather perspectives of staff and the community were also mentioned, however, the interviews primarily focused on students.

Student #2 expressed a desire for more transparency from the Board of Governors and for students to be able to attend and share their thoughts during meetings.

"One thing I think that might be easier just in general is just to be a little bit more transparent. I think McMaster has a sustainability report now, which is really nice because you can see it all in like one go. But even for divestment, it's a lot of behind the scenes, [Board of Governors] committees and I wonder, what do you talk about during meetings? Can students come to them and tell you what our thoughts are? Like that sort of thing. Transparency, I feel like just in general, will help across all sectors."

Student #6 explained that they support town hall meetings and would like more in the future because they give students a platform to share their perspectives with decision-makers.

"I like that they had town hall where you could go and ask questions. The town hall that they had last year was not very well run, and it did not really give students a platform to raise their voices, but I think holding more of these in the future would be important, because that's a way that you're getting student perspectives because students don't often go and get to speak to the Board of Governors or the Board of Directors or [the president] or things like that. So, I think having these town halls, like the carbon emissions town hall that they had last year, where they're more open and accessible to students is a really great way to understand what students want, where they're coming from, and where McMaster is lacking because we're, the ones who are living on campus, we're the ones who are dealing with the facilities day to day."

Student #7 explained that they see the Board of Directors as private and disconnected from the people directly impacted by their decisions and would like students to have a greater presence on the board and be more involved.

"I think the decision makers, including more of the staff and students. I don't completely know the whole inner workings of like whole Board of Directors and stuff like that, but I'm pretty sure they're like a private board. They are not really like involved with the university and they make a lot of decisions regarding things about the school. So, I think having more people that sit on the board that are directly involved and have stakes in McMaster, so they care more about what the outcomes are, if that makes sense, like maybe having students sit on the board and having professors and stuff like that and yeah just everyone being more involved in initiatives and having open discussions. I don't know what to call but like maybe some kind of panel that like brings in different groups of people to talk about things."

Theme 3: McMaster could better connect sustainability commitments and claims to concrete actions

The participants expressed that they wanted to see McMaster put sustainability commitments into practice and see that the university is taking action to enhance sustainability and address unsustainable practices. This theme was referenced 30 times and in all nine interviews. There were certain areas in particular that were often referenced, including divestment, waste management, and sustainable green spaces. These are described in further detail below.

Student #2 explained that McMaster's current investments in fossil fuels go against the sustainability strategy's first guiding principle: "We look through a lens of indigeneity in our sustainability efforts" and would like the university to put their guidelines into action.

> *"Okay well I'm so biased, but I would want them to divest. You probably hear that a lot. There's a huge movement to get them to divest and the [Board of Governors and Directors] just aren't really listening to students. One thing, if I'm looking back at the sustainability survey five principles, it's connecting those principles with tangible action . . . and if you understand that your first principle is we look through a lens of Indigeneity in our sustainability efforts, and then you connect that to the divestment movement and you realize that those things are in conflict. So, I think prioritizing what they actually mean or putting those guidelines into concrete action would be beneficial for McMaster."*

Student #2 also explained that McMaster cafeterias have introduced compostable cutlery, but with no means of composting the utensils. This represents an effort and commitment to improving waste management; however, this has not been implemented consistently in all areas.

> "The other thing is a lot of, not ironic, but paradoxical things. For example, Centro and MUSC now have compostable cutlery, but I look at it and I don't even know where to compost this on campus. The compost bins that were in MUSC are all closed now so they just all go to garbage. So, it's like, why would you do it in one sector and then not another?"

Student #9 contrasted McMaster's pride in having a green space on campus and promoting environmental health with planting invasive species for aesthetics.

> *"McMaster prides itself on having a green space and being a very clean campus. However, considering the way that the green space is managed, it's a little counterintuitive. McMaster wants to promote environmental health by having Cootes Paradise and the Royal Botanical Gardens overseeing Cootes Paradise. However, a lot of the greenery planted on McMaster's campus isn't something that's of an ecological benefit. Even at the entranceway to some of the trails, closer to the Alpine tower and the Les Prince residence there's a bunch of invasive species planted there that were planted for the sake of aesthetics. That has more of a detriment to the environment than it does a benefit. So those small things like being aware of the ecological nature of the space that you have, so you work towards providing biodiversity rather than reducing it. Those small things, I think McMaster needs to think about more. I think that's one of the major ones that I can think of because one of the courses I took, it was a field methods course, and we spent three hours in a lab just removing invasive species because it was of detriment to the rest of the*

green space. Even though McMaster had spent so much money on buying these invasive species."
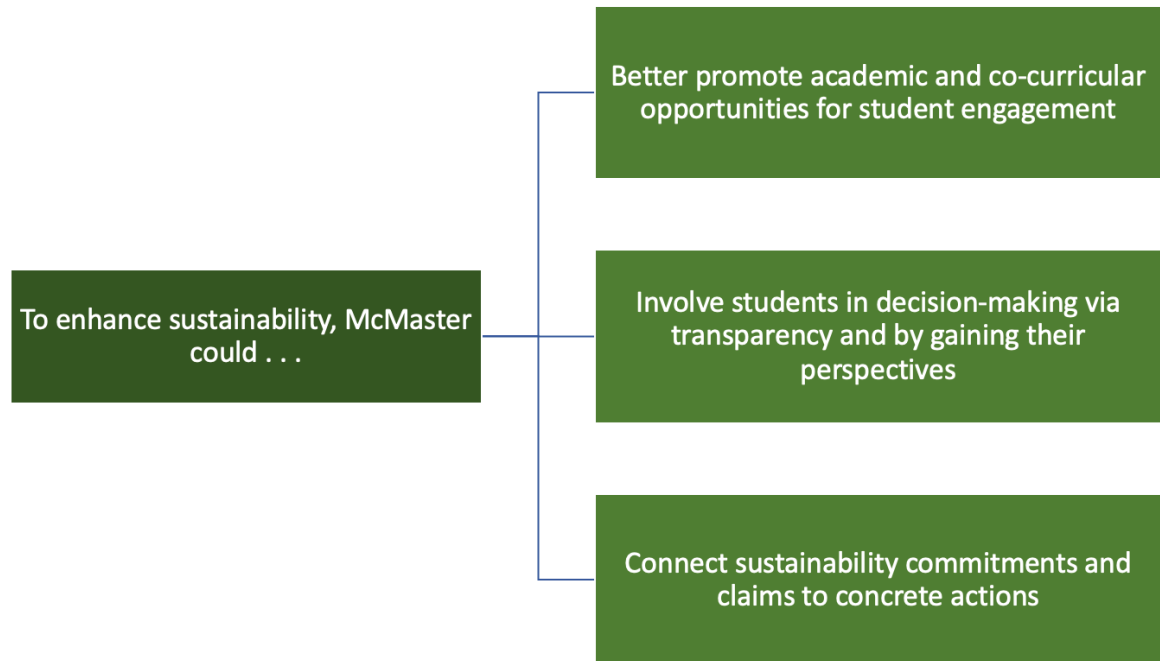
Figure 1. Courses of action McMaster could incorporate into their sustainability strategy, from the perspective of students.

Discussion

The main objective of this study was to understand student perspectives of campus sustainability and propose best practices to enhance various avenues of sustainability at McMaster. The results of this study show that McMaster could enhance sustainability by better promoting academic and co-curricular opportunities for student engagement, involving students in decision-making by being more transparent and gaining student perspectives, and connecting sustainability commitments to concrete actions.

Theme one highlights that McMaster could implement more strategic awareness and promotion strategies to expand the outreach of different sustainability engagement opportunities to the student population. The first two quotes selected for this theme represent students who discovered sustainability because of their own curiosity. Student #2 described their experience of becoming involved as a "whim" after emailing the ASP office. This student further highlighted that many other sustainability opportunities exist, but they are not well promoted to students who are not already involved in sustainability. Student #8 expressed that their sustainability journey only began because of one professor who happened to mention the sustainability minor. Both

students' experiences suggest a lack of awareness for sustainability opportunities at McMaster, which is further articulated by Student #6, who missed the opportunity to complete the sustainability minor. It is important for McMaster to improve in this area, as students are future leaders who will be responsible for advocating for and implementing sustainable practices; therefore, encouraging involvement in sustainability is a crucial first step in this process.

There are several ways that McMaster could promote sustainability opportunities and make information more accessible to students. The participants provided several suggestions, such as holding more information nights targeted towards first- and second-year students, which would allow students to discover sustainability opportunities such as the minor earlier in their academic careers. In addition, such opportunities could be promoted on social media (e.g., on TikTok, Instagram). There are also times where students would be receptive to and interested in trying new things, and McMaster could leverage these to promote sustainability to students. For example, sustainability events could be held during May at Mac, a campus-wide open house for high-school students interested in attending the university, as well as Welcome Week, a week of events for incoming first-year students. Students also expressed that sustainability events could be held more often throughout the year and promoted via email and newsletters, however, their preferred and most accessible means of accessing information is social media.

Theme two articulates that McMaster could better involve students in decision-making by increasing transparency and gaining their perspectives. Participants described a lack of transparency from senior boards and committees and would like them to better gather student perspectives when making decisions. The participants wanted the opportunity to be able to attend meetings, read and access meeting minutes, share their views and ideas, and ask pertinent questions. In addition, they expressed a desire for students to be members of these boards and committees. Students at McMaster have a wide range of ideas and thoughts on improving sustainability at McMaster, as made evident through the interviews, but they are not given the necessary platform to share their concerns and/or solutions. Part of this problem, as expressed by participants, is that student perspectives are often pushed aside or undervalued concerning important sustainability related policy or strategy decisions from senior-level management. It is important for McMaster to improve in this area, as students are key stakeholders who are affected greatly by decisions made by the university. Furthermore, students are on campus every day and possess valuable insights that can enhance decision-making regarding sustainability.

We have conducted research into the various boards and committees that play a role in sustainability at McMaster in order to provide recommendations on how to enhance transparency and incorporate student perspectives. Currently, the Board of Governors publishes meeting materials, meeting dates, and meeting minutes. Students can attend meetings and can ask questions during allocated periods or anytime via email, however, students are not aware of these avenues and efforts could be made to promote them. For example, the University Secretariat website does not mention that students are able to attend meetings and to email the Board of Governors for the meeting link. Furthermore, it does not encourage students to communicate questions via the email provided. In addition to being written on the website, this information could be shared to student sustainability groups such as SSAP and on social media to encourage student attendance. The meeting minutes could also be made more accessible and summarized, as they contain complex or unexplained terms, dense information, and many pages. In addition to the Board of Governors, there are several other committees that could implement the mentioned suggestions to enhance transparency and involve students. We recommend that all committees have student presence and

engagement, as well as a website with information about the committee, meeting dates and agendas, and meeting minutes or summaries written in accessible language. The President's Advisory Committee on Building an Inclusive Community (PACBIC) is an example of a committee that does this well, and can be referred to for guidance (https://pacbic.mcmaster.ca/#:~:text=The%20President%27s%20Advisory%20Committee%20on,the%20President%20on%20such%20issues).

Theme three states, "McMaster could connect sustainability commitments and claims to concrete actions". Namely, students wanted to see the university put commitments into practice and take action to enhance sustainability. For example, student #2 identified McMaster's perceived lack of action towards divestment, as there is in fact, a stated commitment by the university to divest from fossil fuels as soon as possible. Furthermore, student #2 noted that efforts to improve waste management are not being implemented consistently, citing the introduction of compostable cutlery with no composting bins. Student #9 identified that McMaster plants non-native species on campus for aesthetics, which seems to contradict the university's strong commitment to sustainable landscapes.

We recognize and understand that McMaster is making a great effort to enhance sustainability and invest responsibly. The problem is that these efforts are not always clear to students. Therefore, our recommendations are two-fold, and they are specific to the types of commitments and actions being made. Firstly, where projects can produce tangible outputs in the short term, McMaster could make them visible and celebrate their outcomes. This would be appropriate for things such as public-facing composting and native plants. However, some projects take a long time, have outcomes that are not so tangible, or involve governance process that prohibit rapid release of information. In these cases, we recommended that McMaster releases accessible progress updates where possible. Not only would this help to make visible the university's actions towards its commitments, but it would also improve transparency, which is a component of theme two.

The findings of this study are generally in line with previous studies; however, they also provide novel insights to the field. Nejati and Nejati (2013) reported community outreach and sustainability commitment and monitoring as key areas to assess the sustainability of a university from the perspective of students. Furthermore, the reduction of campus activities' impact on the environment was identified as a key area, which is consistent with waste management mentioned as part of theme three. These are consistent with themes one and three respectively. In a similar study by Pop et al. (2020), community involvement was identified as a factor, which is consistent with theme one. The findings by Dagilute et al. (2018) show that students in 'green' universities tend to seek out more information and are more involved in sustainability activities, which aligns with theme one as well, justifying it as an important area for McMaster's sustainability strategy to focus on. None of the key themes aligned with the four sustainability areas students found important in the study by Nagy and Somosi (2020); however, separate waste collection was identified as an important area, which was mentioned as part of theme three. Overall, our study further emphasizes the importance of student involvement in sustainability and connecting sustainability commitments and claims to concrete action, as established by previous literature.

Previous studies do not mention theme two: the involvement of students in decision-making as a key factor in enhancing sustainability at universities. This represents a novel finding, along with the importance of transparency and acquisition of student perspectives for this to be

successful. Other universities may consider these insights in the development of future sustainability strategies.

McMaster University currently has many excellent sustainability initiatives and is making a strong effort to enhance sustainability. However, our findings demonstrate that students want McMaster to implement changes in three areas: awareness and promotion of sustainability engagement opportunities, inclusivity from decision-makers, and accountability from the university in terms of their commitments, claims, and actions. The recommendations in each theme come from carefully analyzing the data set, collaborating with other members of McMaster, and most importantly, from the students themselves. However, our recommendations are not exhaustive. Further research must be conducted on each theme to understand the best means of implementing them. For example, how to best engage students using social media, how to make the decision-making process more accessible to students, and the specific areas students want to see evidence of action in.

Incorporating the findings of this study into McMaster's sustainability strategy is the first step for quantifiable change – the university now has direction to enhance sustainability practices and better integrate sustainability into the lives of students, staff, and faculty at McMaster.

Acknowledgements

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Appendix A

Letter of Information and Consent

Purpose of the Study: To understand the unique student perspectives of McMaster's current sustainability efforts, plans, and future directions, in order to inform the development of a university-wide sustainability plan.

As a student at McMaster University, we are inviting you to participate in an interview so that we can learn what you think about your views on sustainability. The interview is optional but taking part will support our sustainability course work and help us understand ways to bridge the knowledge gap and improve McMaster's sustainability efforts and practices.

I, Robert Rozman, am the Primary Student Investigator, along with my student team members, Maryam Rehman, Ramitha Muralitharan, Michelle Mariaprabhu, and Nicole Chong, and we are working under the support and supervision of Michael Moore, Manager of Sustainability, Urban Design and Space Planning under Facility Services and our course instructor, Dr. Kate Whalen.

Procedures involved in the research:

We want you to know about the study components, procedures, and the steps we will take to maintain your confidentiality.

If you agree to take part in the interview by providing consent, you will meet with one member of the student research team so that they can learn about your unique perspectives on McMaster's sustainability plans and future directions for sustainability initiatives.

We will ask you questions like what sustainability means to you and how would you define it, but we really just want to have a conversation to hear your thoughts on the topic.

The interviews will take place from October 21st to November 5th, 2021, via Zoom, which is an externally hosted cloud-based service. A link to their privacy policy is available here. Please note that whilst this service is approved for collecting data in this study by the McMaster Research Ethics Board, there is a small risk with any platform such as this of data that is collected on external servers falling outside the control of the research team. If you are concerned about this, we would be happy to make alternative arrangements for you to participate, like having a phone call instead. Please contact me or talk to the student researcher interviewing you if you have any concerns.

As long as you are ok with it, we will record the interview audio and save it to the Zoom cloud so that the interview can be automatically transcribed through the Zoom platform. If you don't want to be recorded or you would prefer that we didn't save your interview to the cloud, just let your interviewer know and they will adjust their Zoom settings accordingly:
- If you are ok with being recorded, but not ok with your recording being saved in the cloud, then the researcher will use their smartphone, which will be set to not save to the cloud, and then they will use the recording to type out the transcript by hand.

- If you prefer not to be recorded at all, the researcher will type notes by hand during the interview.

While interview recordings are being saved and transcribed in the cloud (unless you request otherwise), the researcher will delete the recording and edit the transcript so that it won't include your name. Instead of using your name, they will give you a unique number so that your name and your interview will never appear in the research documents together. Once the recording is transcribed or typed out, the audio file and transcription will be deleted from the cloud, and only the transcription will be saved in a secure drive hosted by McMaster called 'OneDrive'.

We also request that, as a participant, you agree not to make any unauthorized recordings of the content of our interview.

Potential Harms, Risks or Discomforts:

The risks in the study are low. However, you may feel uncomfortable sharing your thoughts and feelings, or you may be worried that what you share with me may impact your relationships at McMaster University.

Please know that taking part in the interview is optional and you can choose to withdraw at any time, even if you have already started. We can send you the interview questions beforehand so that you can prepare your answers in advance.

During the interview, you can skip any question that you do not want to answer and stop the interview at any time.

We plan to capture the main themes through participant feedback, but we are also interested in capturing some quotations. While we, the student researchers, will know what you said in the interview, all direct quotes included in our report will be anonymous. To be completely sure that you are comfortable with the quotes we use in our report, your interviewer will contact you and ask for your permission to use the quote. At that time, you can choose not to have your quote used, and you can clarify your quote before it is used. If we do not hear from you on any revisions or request to omit the quotes, we will assume that you are ok with us using them in our report.

If following the interview, you change your mind and would rather we not use your information for research purposes, you can contact any member of the research team, or Michael Moore, before the beginning of February to let us know to delete your quotes and/or interview records.

With respect to any concerns you may have about sharing your thoughts with us, we want you to know that your feedback, both positive and critical, is important to us and we value your honest opinions. None of your feedback will negatively affect your reputation McMaster University because we will keep it in utmost confidence, only sharing what you allow us to share. We want to hear from you so that we can understand the range of perspectives on sustainability at McMaster.

Potential Benefits:
This research may benefit you by contributing to current sustainability efforts, plans, and future directions, in order to inform the development of a university-wide sustainability plan, because we will learn and share the information about thoughts and opinions of McMaster student, with the McMaster community While not benefiting you directly, taking part in this interview will also contribute to our learning as community-engaged and sustainability-minded students, community members, and possible future researchers.

Compensation:

Your time and feedback is very valuable to us. For participation in this interview, you will receive a $10 Starbucks e-gift card.

Confidentiality: Every effort will be made to protect your confidentiality and privacy.

- Your identity will be known to the student researchers, but we will store your data and use quotes with only a unique ID number attached to it, rather than your real name.
- However, we are often identifiable through the stories we tell, and our community is small enough that others may be able to identify you based on what you say in the interview. We plan to publish the findings of this research along with some direct quotes, but we will check with you before including any of your quotes to make sure you feel comfortable with the information we intend to use, and that the information does not identify you in any way. We will give you one week to revise or decline use of any quotes. If we do not hear from you otherwise, we will assume that you are ok with us using the quote(s).
- Audio recordings can be personally identifying; however, the researchers will delete the recording and transcript from the Zoom cloud 30 days following your interview and will only store the transcription file on the university's OneDrive platform, which will only be accessible by members of the research team. The transcript file will be deleted from OneDrive on April 1, 2022
- The information you provide will be stored with a unique ID number in a password protected file, on OneDrive. We do not intend to produce hard copies of the data. We will delate all interview transcripts, personal information, and related records once the study is complete and at the latest on April 1, 2022. Only summery results will be kept by the community member, which will not include any identifiable information.
- We will also delete any related emails from our records on April 1, 2022.

Participation and Withdrawal: Your participation in this study is voluntary. It is your choice to be part of the study or not. If you decide to be part of the study, you can stop (withdraw) from making your interviews available for research purposes for whatever reason, even if you had originally agreed and up until January 25, 2022. We will contact you on January 15, 2022 for your permission to use any of your quotes. You can choose not to have your quotes used and you can also withdraw from the study at that time. If we do not hear from you though, we will assume that we are ok to use your quote(s). If you would like to withdraw from the study, just let us know and we will delete all associated files, recordings, and emails right away. Withdrawing from any part of the study will not impact you receiving the agreed upon incentive.

Information about the Study Results: We expect to have this study completed by approximately February 20, 2022. If you are interested, we will send you a copy of our report to your email address.

Questions about the Study: If you have questions or need more information about the study itself, please contact our course instructor, Dr. Kate Whalen, by email at whalenk@mcmaster.ca or on her cell phone at 905-541-0645.

This study has been reviewed by the McMaster University Research Ethics Board and received ethics clearance.

If you have concerns or questions about your rights as a participant or about the way the study is conducted, please contact:

> McMaster Research Ethics Secretariat
> Telephone: (905) 525-9140 ext. 2406
> c/o Research Office for Administrative Development and Support
> E-mail: ethicsoffice@mcmaster.ca

Appendix B

Interview Guide:

1) In this interview, we will be talking a lot about McMaster's sustainability efforts.
a. How have you been involved with Sustainability at McMaster?
    i. Can you tell me more about that?
    ii. What are the impacts of that/those initiatives?
b. What other efforts within the McMaster community are you aware of relating to sustainability?
    i. Can you tell me more about that?
    ii. What are the impacts of that/those initiatives?

2) What were your experiences with Sustainability at McMaster in your first and second years?
a. Can you tell me more about that?
b. How could McMaster have enhanced you experience with sustainability in your first and second years? (How could McMaster have better engaged you as a first- and second-year student?)

3) What does sustainability mean to you, how would you define it?

4) The university's working definition is:

A sustainable university is one that prioritizes the mutual flourishing of human and environmental wellbeing; acts as an agent of change to lead society towards a future of ecological reciprocity, regeneration, and respect; and does so by developing long-term frameworks that integrate environmentally, socially, and economically conscientious ideas into all aspects of the university lifecycle.
a. What are your thoughts on this definition?
b. What do you think is missing, if anything?

5) McMaster's sustainability survey notes that they are going to use the following five principles to inform all sustainability efforts. The guiding principles are:

1. *We look through a lens of Indigeneity in our sustainability efforts*
2. *We focus on equity, diversity, accessibility and inclusion in our sustainability efforts*
3. *We see sustainability work as a collaborative, evolving effort*
4. *We strive for innovative solutions tailored to our community*
5. *We share and recognize our sustainability progress and achievements across our community*

    What do you think about them?

6) If McMaster did sustainability excellently, what would the university look like?
a. What changes would you want to see?
b. How would we know we're on the right track?

c. Potential follow-up questions:
   i. Do you think McMaster has been doing well regarding sustainability? Which issues do you feel are being adequately addressed or have been in the past?
   ii. Who do you feel should be responsible for making McMaster more sustainable (i.e., students, staff, decision-makers)?
   iii. Can you expand and tell me more?
   iv. How should faculty, staff, and students collaborate to make McMaster more sustainable?
   v. What have you seen elsewhere that has worked really well and that we can take inspiration from? (e.g., at other colleges or universities)

7) Are there any practices by McMaster that you consider counter to sustainability efforts? If so, which ones?
a. Are any of these practices committed by students? If so, what are these practices?
b. How can the university better support students to make more sustainable choices?

8) Is there something important that I did not ask and you would like to share?