Identifying Waste Management Behaviours of Dalhousie University Students Concerning the Reduction of Disposable Cups on Studley Campus

A Qualitative Study to Assess Current Dalhousie Waste-Management Framework Success and Current Issues

ENVS/SUST 3502: Environmental Problem Solving II: The Campus as a Living

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EXECUTIVE SUMMARY

An online survey was advertised throughout Dalhousie University's Studley Campus asking undergraduate students about their disposable cup usage on campus. From the participating students (n=105) they were divided into two categories based on the faculty their major is in. The science category (n=71) included students from the faculty of science, computer science, and health. The art category (n=34) included students from the faculty of arts and social sciences, management, the social work program, management, architecture, planning, and law. Results indicated there were no significant results when comparing science students and arts students with the number of disposable beverage containers they bought on campus. There was a significant difference between mindsets as science students indicated greater effort to reduce their disposable cup usage than art students. Science students show higher participation in waste reduction and effectiveness, as they showed to have received more environmental education on disposable cups (formally and/or informally) from the university than the art students, despite art students showing higher usage of bringing reusable beverage containers to campus. Overall, there was no difference in waste generating behavior between the two student categories, but both groups agree that the university needs to take more action on this issue. Recommendations for the university would be the school working with on-campus food vendors to work on limiting the number of disposable beverage containers available, as their work could lead to a full-out ban, which students from this study showed to be in support of. The second recommendation for the university is that education on waste mitigation measures needs to be brought into the classroom, as science students indicated that education given out by the university broadens their mindsets on their waste usage, and how individual waste reduction can play out when considering a global environment.

INTRODUCTION

Background

Plastic pollution is one of the major environmental issues we face today. It has been found that plastic production has increased exponentially, from 2.3 million tons in 1950 to 448 million tons by 2015 and the production is expected to double by 2050 (Parker, 2019). Plastics entering our ecosystems have numerous negative impacts. One of the most notable places that it ends up in is our oceans. The problem of plastics in our oceans has first appeared in the 1970s (Jambeck et al., 2015). It was found that every year, about 8 million tons of plastic waste escapes into the oceans from coastal nations (Parker, 2019). Plastics in the marine environment are weathered into debris producing microplastics. Microplastics are not visible by the naked eye and can come from various sources such as plastic debris that degrades into smaller and smaller pieces. Dalhousie University is in Halifax and is in close proximity to the Atlantic Ocean. Due to that we must try to lessen our use of disposable plastics.

Waste management systems have been placed mostly in developed countries to reduce plastics in the oceans but the same cannot be said in countries that are still developing. The Halifax Regional Municipality has a by-law S- 600 which has bin standards and the four-way bin system which consists of organics, garbage, recyclables, and paper (HRM, 2015). This four-bin system is practiced at Dalhousie University. Since the four-bin system is already applied, we decided to focus on the landfill bin which mostly consists of disposable cups on Studley Campus.

Past Research

Research regarding waste behaviours pertaining to disposable cups are limited. Plastic waste which consists of disposable cups is a sustainability concern that is only growing with the amount of accessibility to it (Accorsi, 2014). A research was conducted at the Prince George campus in Northern British Columbia to characterize waste in order to successfully plan a sustainable waste management (Smyth et al., 2010). This research discovered that disposable drink containers are one of the most significant material types that needs to be targeted for waste reduction efforts (Smyth et al., 2010). Their data revealed that more than 70% of the waste generated in 2007-2008 could have been eliminated by waste reduction, recycling and other sustainable practices (Smyth et al., 2010). Results in the study showed that education can be used to promote the minimization of behaviours pertaining to waste (Smyth et al., 2010). It is

significant to our research because it identifies disposable cups as a significant material to be targeted to reduce waste. A report done by the Office of Sustainability here at Dalhousie found that on campus food vendors who distribute food in disposable containers have little to no sustainability advising on food packaging (Allott, 2016). This research was titled Fundamental investigation of solid waste generation and disposal behaviour in higher education institutes in the Kingdom of Saudi Arabia which aims to understand waste generation and disposal patterns that play a crucial role in developing realistic waste reduction strategies (Saleem et al., 2018). Their data came from surveying students in order to develop realistic plastic PET (polyethylene terephthalate) bottle waste reduction strategies (Saleem et al., 2018). In the survey results they found that 40% of students said that they choose disposable PET water bottles for convenience (Saleem et al, 2018). They also found that 80% of students would support a management decision to replace PET bottles with alternative sustainable drinking water solutions (Saleem et al., 2018). The significance of this research is because of the high agreement of students to reduce their plastic waste. Student motivations shape behaviour and that is why our study focused on such a topic.

Goals and Objectives

The primary goal of our research is to identify waste behaviours of students on Studley Campus and to learn what drives student's motivation behind their purchasing of disposable cups, or why they use reusable containers. By studying behaviours, our objective is to establish the current waste behaviours that are established on Studley Campus and determine a course of action that can disrupt this pattern and make a change in the system and to promote sustainability initiatives. That led us to our research question: What factors influence Full-time Dalhousie Undergraduate Students' behavior pertaining to reducing their usage of disposable cups on Studley Campus?

Purpose

The purpose of this research is to better understand waste management behaviours and the values that drive them. This study can help identify the behaviours regarding the use of disposable cups and the level of environmental education either formal or informal that is

provided at Dalhousie University. This research can build on topics that pertain to waste at Dalhousie University, with specific regards to disposable containers used on campus.

METHODS

For the purpose of assessing the student's behaviours on disposable cup usage an online survey was created. The reasons for choosing a survey was for the convenience and efficiency of collecting and analyzing data from a relatively large sample, and the ease by which a comparison of the responses could be done. Further, given the busy nature of the population being sampled, undergraduate students, online surveys seemed the easiest to access and most likely to be answered from this population. The survey included nine close-ended and four open ended questions (Appendix B). The survey questions assessed various aspects pertaining to the participants' demographics and their waste generating behaviour. The population being sampled for this study included a subset of the 15,000 Dalhousie undergraduate students from the Halifax campuses (Dalhousie, 2019). A priori power analysis determined that for a marginal error of 5% ($\alpha = .05$) the sample size would need to include 375 students.

Recruitment

Students were recruited via social media posts, several Dalhousie professors' posts on the University's online course management system and posters that were hung on various advertisement boards at popular student meeting places across campus (with a Q-code that had a link to the survey).

Survey Methods

The survey itself was delivered online via the Google Forms software, and also served to acquire informed consent. The survey was anonymous, but an incentive was offered to increase participation, which required the participant to enter their email address. This means that participants could choose to have their information be confidential, with only author and co-authors able to view information (if they provide an email), or completely anonymous meaning there is no way to identify their information with their answers by anyone.

Data and statistical analysis

Participants were categorized into two groups, science students and art students, based on their responses. Quantitative data were statistically analyzed through methods of two-tailed t-test, paired t-test, and looking at general trends of the data. The "yes/no" questions from the survey were analyzed through Person's Chi-Square test, along with the open-ended questions that were coded for common themes using Excel. Responses were categorized as follows: agree, disagree, positive feedback and negative feedback.

RESULTS

Population

From the survey results (n = 105), students were divided into two groups based on Question #3 of the survey which asked what program their major is in. The science category (n = 71) included students from the faculty of science, computer science, and health. The art category (n = 34) included students from the faculty of arts and social sciences, law, the social work program, management, architecture, and planning. Due to the low number of total participants, results could be considered to be insignificant due to the low population numbers and be seen as significant comparing the two categories due to their uneven population counts. This does not apply to statistical analyses, which account for differences in sample size when calculating a p-value. All graphs and tables are available in Appendix A of report.

Background / Education

The participating students were asked in Question #5 if they have received formal and/or informal environmental education from Dalhousie University about disposable cups. The majority (50%) replied "No" (Figure A.2.2), with no significant difference (p-value = 0.8865) between the science students and the art students (Table A.1.2). For those who said they have received education (38.5%) were asked how that education impacted them, in which one student responded with "My sust classes have helped me understand the environmental impacts of waste." This class is referring to the classes that the College of Sustainability (Class code SUST) offers for students in multiple faculties, including both categories of students in this study. There was a significant difference (p-value = 0.5295) between the two student categories (Table A.1.5) as there were more science students who had received education compared to the art students.

The difference in population counts could play a factor in this result of why it is significant. This lack of education is seen later in Question #9 when only 60% of the participating population properly dispose of their disposable cup in the landfill bin (the only bin it belongs to within Dalhousie four-bin system), and 25.7% admitted to putting these cups in other bins (Figure A.2.3). This result held no significance difference (p-value = 0.9470) to which of the faculties the student belonged to (Table A.1.3).

Given this background information, students were asked about their disposable beverage container usage on campus (Figure A.1.1), which showed a non-significant difference (α = 0.6597) between the two categories of students. Similar results were seen when asked how often they bring a reusable beverage container to campus (Figure A.1.2) with non-significant (p-value = 0.11723) results between the two groups. This data is supported by the majority (89.4%) who said since starting Dalhousie University they purchase a reusable cup/bottle (Figure A.2.1), with no significant difference (p-value = 0.8131) to what category the student belongs to (Table A.1.1). Therefore, it is reasonable to say that these student's education choices do not determine the number of disposable beverage containers being purchased or the number of reusable beverage containers being brought to campus.

Behavior Patterns

Social norms within the Studley Campus surrounding drink decisions can play a major role in affecting students' personal and social behaviours when dealing with drink-related purchasing (Hynes & Wilson, 2016). When asked in Question #10 if any social pressures would turn them away from using disposable beverage containers on Studley campus, there was a significant difference (p-value = 0.4386) between the mindsets of the science students and the art students (Table A.1.6). Students from the science category coded more for positive feedback from social norms, and that they do exist on Studley Campus, compared to art students who wrote they saw little pressure from social norms to reduce their disposable cup usage. Where social norms are not determining art students usage of disposable cups, they averaged high for Question #11 with a 4.29/5 average saying personal reduction is important to them, which has a non-significant (α = 0.7625) difference to the science students who average 4.35/5 (Figure A.1.3). This showed that both groups of students think highly of reducing their personal usage of disposable cups. When asked if they believe their reduction of disposable cups would make a

difference to the global environment, averages from the student groups were lower, with science students averaging 3.67/5, and the art students a 3.59/5. Results were significant ($\alpha = 0.0001$) when comparing the science category students' opinions about their personal waste reduction compared to their views on global environmental impacts. The art students saw a similar significant result ($\alpha = 0.002$) with the comparison of averages. This was done by a paired-t-test comparing the student's own reduction to their believed affects it would have on the global environment (Figure A.1.3). This means that students from both categories believe that their reduction of disposable cups will not make a large difference to the global environment, but given the high averages are still willing to mitigate their personal waste.

When asked if they are inclined to change their disposable cup usage, the majority of science students said they would for reasons of environmental benefits, and personal motivations to the reduction of their waste: “yes I will be willing to change my behavior when it comes to disposing of disposable cups. An environment is an important place and as humans, we need to maintain and take care of the environment.” From the art students, most of them were inclined to change their waste, but there was more resistance to change than from the science students. Art students indicated that there is a lack of impact, convenience drives their choices, and many point out their struggle of making it a habit to bring their reusable cup to campus: “Hypothetically yes but I never bring my cup with me.” From both student categories, there are students unwilling to change their current lifestyle due to their current active reduction of disposable cups, or they do not see a purpose behind why reduction matters. There was a significant difference (p-value = 0.0755) between the two student categories (Table A.1.8) as overall, science students were more willing to make a personal change than the art students.

Changes to the Campus

From participating students 61.9% indicated that they would be in support of a ban of disposable cups on Dalhousie Studley Campus (Figure A.2.4). This ban was supported by students of both categories as there was a non-significant difference (p-value = 0.9004) between the two student categories on this ban (Table A.1.4). Many from both the science and art categories called upon Dalhousie University in Question #14 for its lack of awareness, information, and incentives that lead people to use disposable cups. Where the majority does not feel like Dalhousie University is doing a good job, there were a few students from both groups

that said classes and societies do spread awareness about disposable cup reduction, an example is from this science student: “I haven’t received any formal education in classes, but from various groups on campus and some official information through the university. As of now, it is enough, though I think it could be better”. There was a significant difference (p-value = 0.0009) between science students and art students about Dalhousie’s creation of awareness (Table A.1.7). The science students said there was a lack of awareness on campus, as one student wrote: “No, I haven’t really seen any push from Dalhousie to do so at all.” The art students, where some agreed with the science students about the lack of awareness, the majority had a more positive view of the university, with one student arguing: “I don't think education is what is needed at this point, I believe the vast majority of students at Dal understand, at some level, that single-use plastic is bad.” Overall, the majority of participating students are calling upon the university to raise awareness about single-use waste, and to provide pressure to vendors to incentivize those who bring reusable containers than their current methods.

DISCUSSION

Disposable Beverage Usage

Our study aim was to understand the behaviour of student’s waste consumption and reduction efforts on Studley Campus. Results indicated there were no statistically significant results from frequency of use of disposable containers between the art students and the science students’ categories that participated in our survey, but the findings have implications that may still be useful for Dalhousie policy and practices. It was predicted that science students would have a greater understanding of how to mitigate waste usage and implemented this knowledge in their daily lives on campus. However, science students used almost the same amount of disposable beverage per school week as art students, (Figure A.1.1), while art students reported a higher frequency of bringing a reusable beverage container to campus (Figure A.1.2). Even though none of these differences were found to have statistical significance from two tailed t-tests (Tables A.2.1-A.2.4), it seems that observations of the difference in the mean find that students in science practice around the same if not less waste reduction regarding disposable beverage waste on campus. However, science students reported higher average ratings of waste reduction effectiveness and importance (Figure A.1.3). This suggests that science students have similar beliefs as art students but are either less motivated or less equipped to effectively

implement waste reduction behaviours within their life. This could be explained by a heavier course load for science students, thus causing the observed higher usage of disposable beverages that offer convenience, useful in a busier student life. Another explanation could be an overload of information surrounding environmental degradation and necessary environmental action in science classes that is leading to burnout and inaction (Horne 2009). This is even more likely in light of findings that students in science have received more environmental education (formally and informally) than art students (Figure A.2.2). Further, science students' strong belief (Figure A.1.3) in the importance of waste reduction may suggest that students from this faculty are highly motivated, but do not prioritize waste management in their daily lives due to information overload (Horne 2009) or time constraints.

Environmental Education Drivers

There was a significant difference between the science students and the art students in answers to whether they received environmental education about disposable cup behavior formally or informally at Dalhousie, as science students had received more (Table A.1.5). These findings are aligned with predictions that since science students have greater access to more courses and are more likely to participate in extra-curricular on-campus activities (Patrick et al., 1993) surrounding environmental topics and problems, they would have more exposure to formal or informal environmental education. This difference in education may explain the significant differences found in faculties regarding Question #13 about motivation to change current personal disposable cup behavior patterns (Table A.1.8). The likely cause for this difference is that science students have the waste management education to be able to effectively carry out the positive environmental values that science students rated find of higher importance and relevance (Figure A.1.3). Whitley et al. (2016) supports these findings, demonstrating that students with higher altruistic and biospheric learned values (commonly taught in environmental education) were more likely to successfully execute positive environmental action. Extensions upon our study, should include a more detailed exploration of the values behind students' waste behaviours to understand whether students are managing waste behaviours based off of their values or other factors and whether Dalhousie's policies, social environment, environmental education, and waste practices are influential in creating or fostering these values. Smith et al. (2018) is the only past study where social values that may affect waste diversion at Dalhousie

were studied. Similar to this study's findings in differing behaviours in art and science students, Smith et al. (2018) found that different social factors and attitudes make a difference in waste management behaviours on campus.

Both art and science students have aligned opinions (Table A.1.4) surrounding proposed changes to Dalhousie waste management policy but differ in accounts of social pressure and Dalhousie past action. Most participants (in both faculties) disagreed that Dalhousie was working hard enough to support waste reduction on campus in long answer question #14 (Table A.3.1). However, science students had statistically significant responses of negative feedback about Dalhousie's actions versus art students (Table A.1.7). The majority of participants would support a ban of disposable cups (Figure A.2.4), with about a quarter of the respondents' undecided surrounding this decision (Figure A.2.4). A ban may be the most effective action, as voluntary behavior change regarding waste is significantly less effective in creating waste reduction action than incentivized change (Tangwanichagapong et al 2016). These results may be because of social pressure at Dalhousie with science students experiencing a statistically higher social pressure to reduce waste (Table A.1.6) than art students. The difference in social pressure may be linked to the way that environmental education is consumed by science students, with faculty of science respondents reporting that environmental education had a larger stake in their waste management decisions on campus than art students (Table A.3.5). In the future, studies should focus on interviews with professors in each faculty to understand how environmental education is taught and whether it is based in science or moral (or both) arguments for change.

Limitations

This study's goal was to receive 375 respondents for a proper sampling size proportion failed due to circumstances outside of our control. Due to campus closure in the middle of the survey collection period (March 9th, 2020 to March 21st, 2020) due to Covid-19, our advertising and student recruitment tactics were significantly less viable and successful. Therefore, we were only able to collect 105 responses to our survey. This poor response rate led to a low sample size, meaning this study should be considered a pilot-test for these survey questions. In the future, these questions should be extended to a wider Dalhousie audience to meet minimum sampling size and to be able to effectively make conclusions about the entire Dalhousie population from collected data.

CONCLUSION

Recommendations

Along with a full roll-out of this survey to a larger Dalhousie audience, there are certain recommendations that can be made to provide resources and guidance to students regarding disposable cup waste usage on campus. First, Dalhousie should seek cooperation from on-campus food vendors to reduce the amount of disposable cup availability until the effects of a ban on disposable cup usage can be assessed and potentially implemented. Students in our science and art categories agreed to support such a ban based on the results of this survey (Figure A.2.4). Next, student values around waste management should be studied so that motivations surrounding waste decisions can be truly understood in a broader context. Professors in all faculties should also be interviewed if they teach any environmental content, to understand whether they place moral or scientific arguments (or both) for waste mitigation in their classes to better understand the context students are receiving environmental information to inform their decisions.

Key Findings

Our findings highlighted that there are differences between the science and art students regarding their motivation to reduce waste and waste management education. However, waste-generating behaviour in general did not seem to differ between the two populations. This would suggest that education and the resulting intent to reduce waste are insufficient means for substantial reduction in disposable cup waste usage in Dalhousie's current framework and social environment. Responses of both groups indicated that more action is expected and needed by the university. Overall, it seems that Dalhousie University has an insufficient waste management framework to suit its current undergraduate student's needs and concerns. Further research of this nature should be done including a larger roll-out of questions within this survey, so that policies and education programs can be established to reduce disposable cup usage and waste on Studley campus; a goal that students of all undergraduate faculties found of high concern and importance. Dalhousie prides itself as being a school that serves the needs and interests of its community. This small survey is a snapshot in the motivations and behaviours of waste management and sustainability at Dalhousie, that clearly establishes a need for a change in the management of waste on Studley campus and a chance for Dalhousie to serve its community and its environment better in the future.

REFRENCES

Accorsi, R., Cascini, A., Cholette, S., Manzini, R., Mora, C. (2014). Economic and environmental assessment of reusable plastic containers: A food catering supply chain case study. *International Journal of Production Economic 152*. 88-101. doi: https://doi.org/10.1016/j.ijpe.2013.12.014

Allot J. (2016). Institutional Waste Management and Reduction at Dalhousie University. Project Report for Divert NS. Retrieved from:https://divertns.ca/assets/files/Institutional-Waste-Management-and-Reduction-at-Dalhosuie-University-Jennifer-Allott-2016.pdf

Dalhousie. (2019). 2019/2020 Enrolment Statistics- Enrolment by Faculty and Field of Study. Dalhousie University. Retrieved from: https://cdn.dal.ca/content/dam/dalhousie/pdf/dept/oiar/Public_Reports_and_Data/Enrollment/2019/Major_2019.pdf

Halifax Regional Municipality (2015) Solid Waste Resource Collection and Disposal By-Law.Retrieved from https://www.halifax.ca/sites/default/files/documents/city-hall/legislation-by-laws/By-lawS-600.pdf

Horne, R. E. (2009). Limits to labels: The role of eco-labels in the assessment of product sustainability and routes to sustainable consumption. *International Journal of consumer studies*, *33*(2), 175-182

Hynes, N., & Wilson, J. (2016). I do it, but don't tell anyone! Personal values, personal and social norms: Can social media play a role in changing pro-environmental behaviours?. *Technological Forecasting and Social Change*, *111*, 349-359.

Jambeck J. R., Geyer R., Wilcox C., Siegler T. R., Peryam M., Andrady A., Narayam R., Lavender Law K. (2015). Plastic waste inputs from land into the ocean. *Science*. 347 (6223), 768-771.DOI: 10.1126/science.1260352

Parker L. (2019 June 7). The world's plastic pollution crisis explained. National Geographic. Retrieved from https://www.nationalgeographic.com/environment/habitats/plastic-pollution

Patrick, J., Niles, S., Margetiak, C. J., & Cunning, T. J. (1993). The longitudinal relationship between extracurricular activities and congruence between initial and final major among college students. *NACADA Journal*, *13*(1), 48-33.

Saleem, M., Blaisi, N. I., Alshamrani, O. S. D., & Al-Barjis, A. (2019). Fundamental investigation of solid waste generation and disposal behaviour in higher education institutes in the Kingdom of Saudi Arabia. *Indoor and Built Environment*, *28*(7), 927–937. https://doi.org/10.1177/1420326X18804853

Smith, Laura, Tam, Jessica, Martel, Phil, … Jeremy. (2018, April 1). Waste Management at Dalhousie University, Canada: Social Factors Affecting Recycling Behavior and use of the Four Bin System at the Studley Campus. Retrieved from https://dalspace.library.dal.ca/handle/10222/76648

Smyth, D. P., Fredeen, A. L., & Booth, A. L. (2010). Reducing solid waste in higher education: The first step towards 'greening' a university campus. *Resources, Conservation and Recycling*, *54*(11), 1007–1016. doi: 10.1016/j.resconrec.2010.02.008

Tangwanichagapong S., Nitivattananon V., Mohanty B., & Visvanathan C.(2016). Greening of a campus through waste management initiatives experience from a higher education institution. in Thailand. *International Journal of Sustainability in Higher Education. 18(2).* 203-217.doi/10.1108/IJSHE-10-2015-0175/

Whitley, C. T., Takahashi, B., Zwickle, A., Besley, J. C., & Lertpratchya, A. P. (2016). Sustainability behaviors among college students: an application of the VBN theory. *Environmental Education Research*, *24*(2), 245–262. doi: 10.1080/13504622.2016.1250151

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APPENDIX A

T-test Analysis Graphs

Figure A.1.1 Average purchasing of disposable beverages containers on scale from 0 (never) to 5 (multiple times a day).

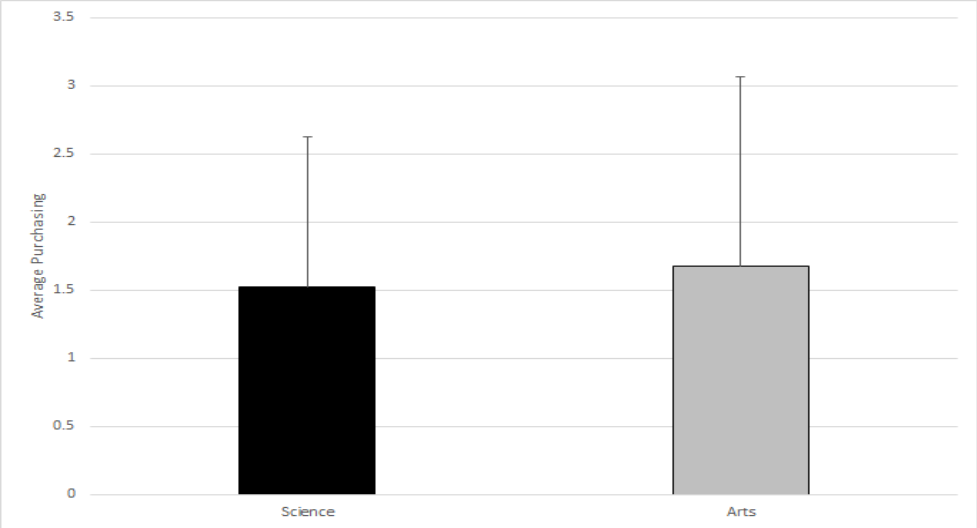


Figure A.1.2 Average usage of reusable beverage containers per week on scale from 0 (never) to 10 (everyday).

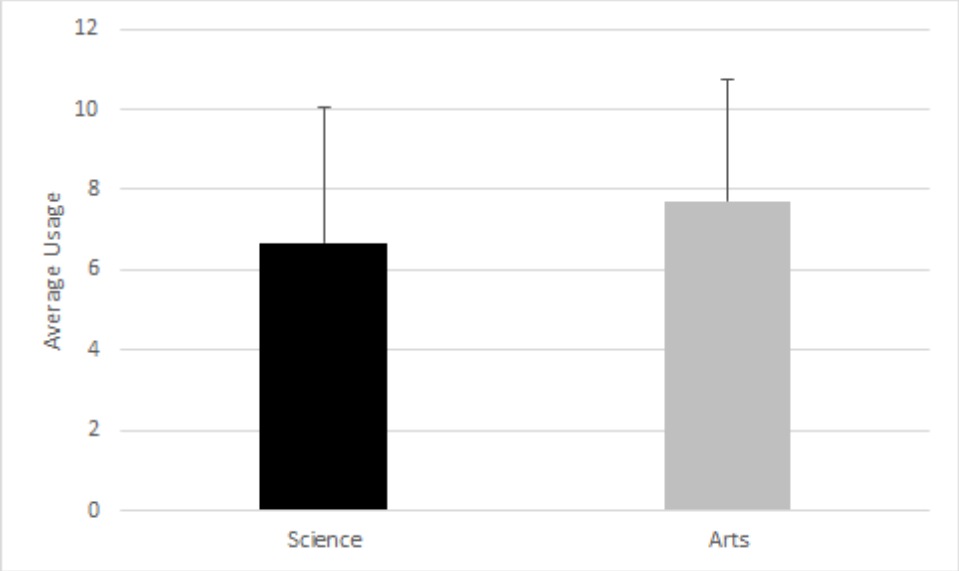
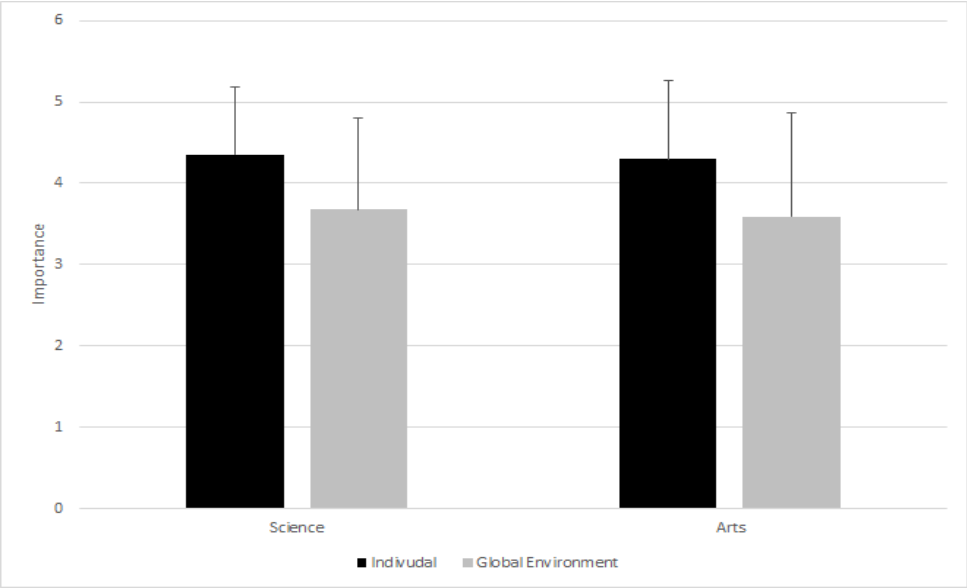


Figure A.1.3 Students View comparison of their personal reduction of disposable cups compared to the impact it would have on the global environment.



Pie Chart Analysis Graphs

Figure A.2.1 Have students purchased a reusable beverage container since starting at Dalhousie University (answers could be yes, no or unsure).

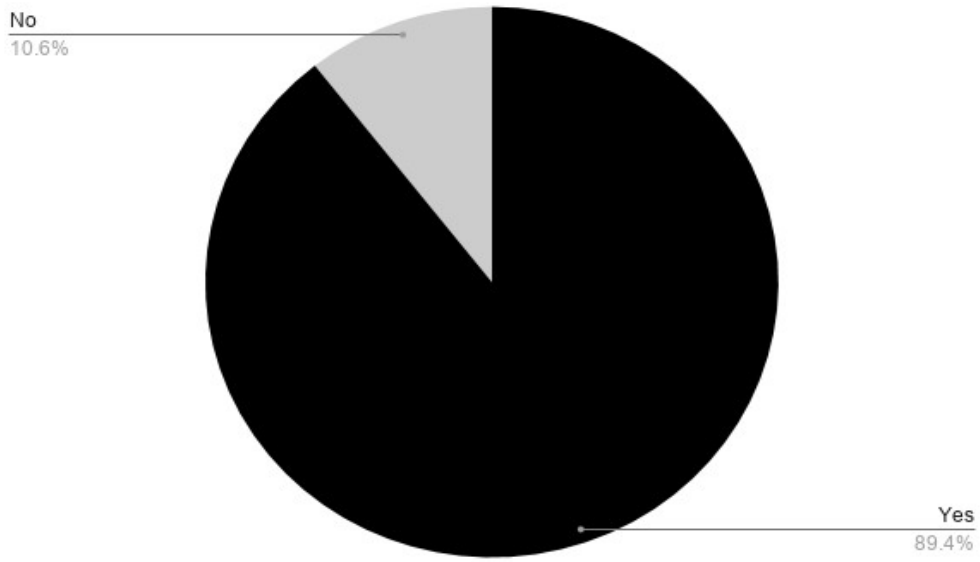


Figure A.2.2 Received Formal and/or Informal Environmental Education regarding Disposable Cups from Dalhousie University (answers could be yes, no or unsure).

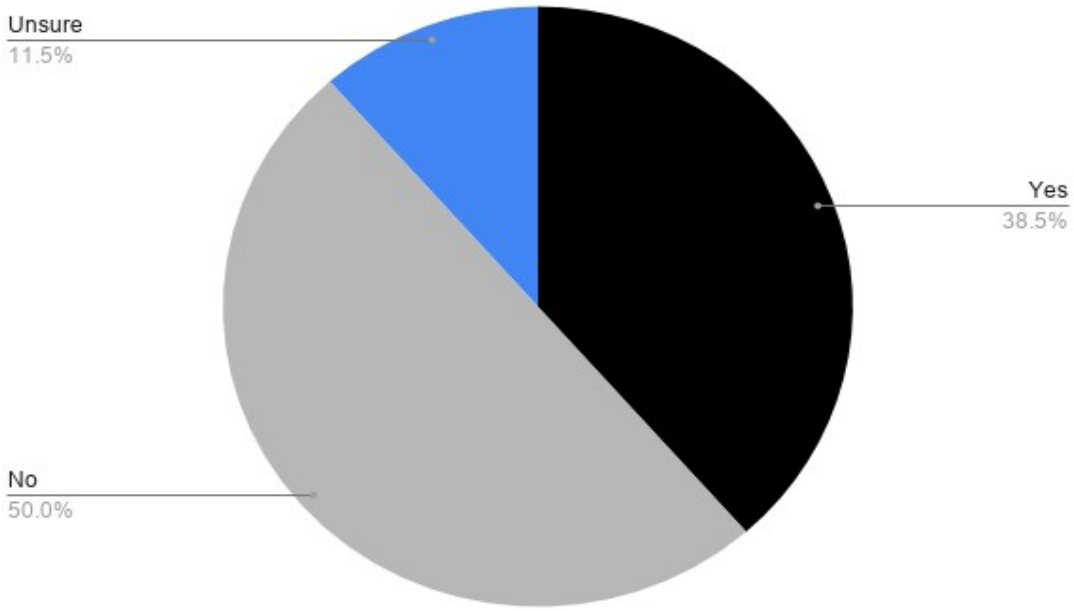


Figure A.2.3 Placement of a disposable cup in a bin other than the landfill bin (answer could be yes, no, unsure or not applicable).

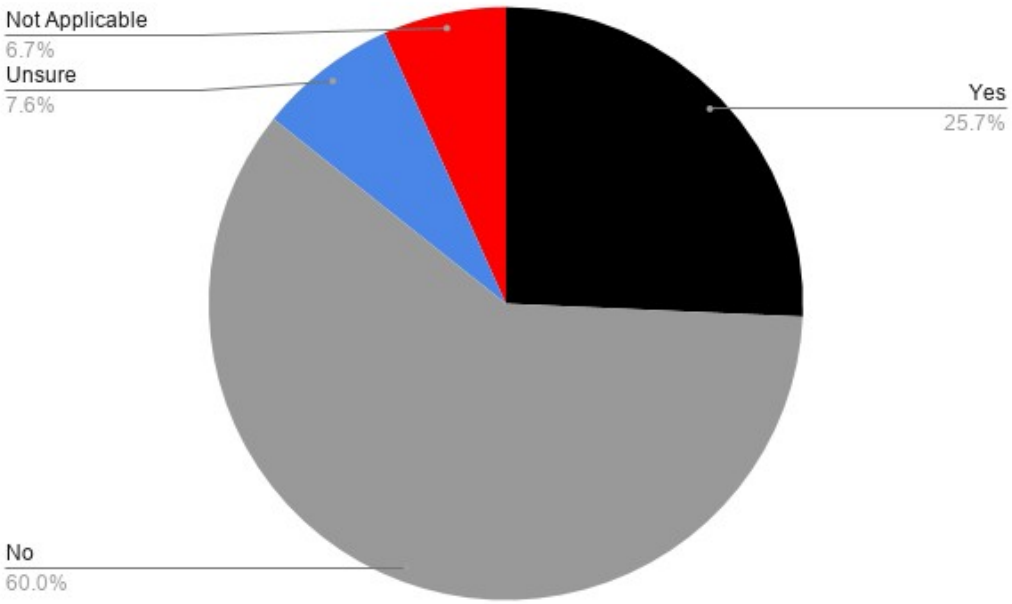
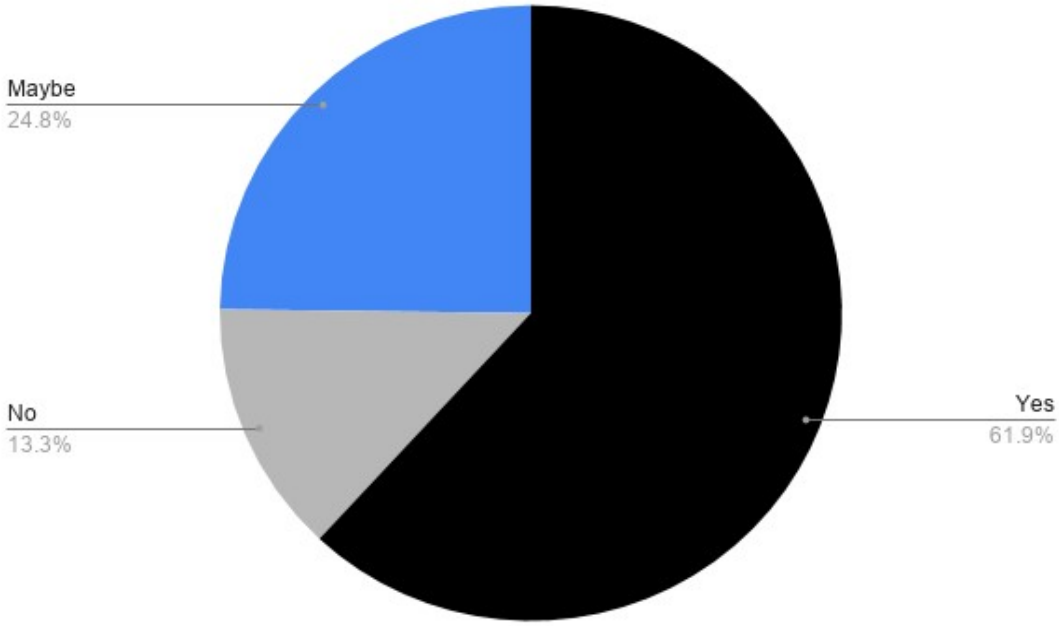


Figure A.2.4 Support for a Ban of Disposable Cups on Dalhousie Studley Campus (answers could be yes, no or maybe).



Chi-Square Statistical Analyses

Table A.1.1 Chi-square results for Question #4 about having ever purchased a reusable while at Dalhousie. The null hypothesis was that there was no difference between Faculty of Science and Faculty of Arts students in answering "yes," "no," or "unsure" to this question. Alternative hypothesis was that there is a significant difference between arts and science students in answers to this question.

$\chi 2$	df	p-value	Null Hypothesis
0.055896	1	0.8131	Accept

Table A.1.2 Chi-square results for Question #5 about having received formal or informal environmental education at Dalhousie. The null hypothesis was that there was no difference

between categories of art and science students in answering “yes,” “no,” or “unsure” to this question. Alternative hypothesis was that there is a significant difference between art and science students in answers to this question.

$\chi 2$	df	p-value	Null Hypothesis
0.24088	2	0.8865	Accept

Table A.1.3 Chi-square results for Question #8 about putting a disposable container in any other bin besides the one labeled “landfill” at Dalhousie. The null hypothesis was that there was no difference between the categories of art and science students in answering “yes,” “no,” or “unsure” to this question. Alternative hypothesis was that there is a significant difference between art and science students in answers to this question.

$\chi 2$	df	p-value	Null Hypothesis
0.20993	NA	0.947	Accept

Table A.1.4 Chi-square results for Question #15 supporting a disposable cup ban at Dalhousie. The null hypothesis was that there was no difference between categories of art and science students in answering “yes,” “no,” or “unsure” to this question. Alternative hypothesis was that there is a significant difference between art and science students in answers to this question.

$\chi 2$	df	p-value	Null Hypothesis
0.20993	2	0.9004	Accept

Table A.1.5 Chi-square results for Question #6 about environmental education affecting disposable cup behavior at Dalhousie. This question split long answered responses into different counts of the coded answers. Categories for counts were agree, disagree, positive feedback, negative feedback. The null hypothesis was that there was no difference between categories of

art and science students in answers to this question. Alternative hypothesis was that there is a significant difference between art and science students in answers to this question.

$\chi 2$	df	p-value	Null Hypothesis
1.2718	2	0.5295	Reject

Table A.1.6 Chi-square results for Question #10 about experiencing social pressures about not using disposable cups at Dalhousie. This question split long answered responses into different counts of the coded answers. Categories for counts were agree, disagree, positive feedback, negative feedback. The null hypothesis was that there was no difference between categories of art and science students in answers to this question. Alternative hypothesis was that there is a significant difference between art and science students in answers to this question.

$\chi 2$	df	p-value	Null Hypothesis
2.7097	3	0.4386	Reject

Table A.1.7 Chi-square results for Question #14 about Dalhousie creating action to reduce disposable cup usage on campus. This question split long answered responses into different counts of the coded answers. Categories for counts were agree, disagree, positive feedback, negative feedback. The null hypothesis was that there was no difference between categories of

art and science students in answers to this question. Alternative hypothesis was that there is a significant difference between art and science students in answers to this question.

$\chi 2$	df	p-value	Null Hypothesis
16.38	3	0.0009477	Reject

Table A.1.8 Chi-square results for Question #13 about personally wanting to change disposable cup behaviors on campus. This question split long answered responses into different counts of the coded answers. Categories for counts were agree, disagree, positive feedback, negative feedback. The null hypothesis was that there was no difference between categories of art and science students in answers to this question. Alternative hypothesis was that there is a significant difference between art and science students in answers to this question.

$\chi 2$	df	p-value	Null Hypothesis
6.8892	3	0.07552	Reject

T-test Analysis Tables

Table A.2.1 Two-tailed t-test for Question #7 about the number of disposable beverages purchased by students on campus on a scale of 0 to 5. The null hypothesis was that there will be no difference between the art category of students and the science category students. The alternative hypothesis was that there would be a difference between the two categories.

t-Test: Two-Tailed Sample: Buying Disposable Beverages		
	Science	**Art**
Population (n)	71	34
Mean	1.521126761	1.676470588
Variance	1.224547284	1.922459893
Standard Deviation	1.106592646	1.386527999
Hypothetical Mean Difference	0	
df	103	
P(T<=t) two tailed	0.5697921058	Null Hypothesis Accepted

Table A.2.2 Two-tailed t-test for Question #8 about the number of times reusable beverage containers are being brought to campus by students on a scale of 0 to 10. The null hypothesis was that there will be no difference between the art category of students and the science category students. The alternative hypothesis was that there would be a difference between the two categories.

t-Test: Two-Tailed Sample: Using Reusable Beverage Container		
	Science	**Art**
Population (n)	71	34
Mean	6.661971831	7.705882353
Variance	11.34124748	9.304812834
SD	3.367676868	3.05037913
Hypothetical Mean Difference	0	
df	103	
P(T<=t) two tailed	0.1172367927	Null Hypothesis Accepted

Table A.2.3 Two-Tailed t-test comparison of question #11 and #12 of science student's mindset of their independent disposable beverage reduction to the impact it would have on a global environment. The null hypothesis indicates that the science student population mindset would be similar for both concepts. The alternative hypothesis would suggest that the science students' mindset would differ between individual reduction and its effects on the global environment.

t-Test: Two-Tailed Sample: Science Independent vs Global		
	Independent	**Global**
Population (n)	71	71
Mean	4.352112676	3.676056338
Variance	0.6885311871	1.279275654
SD	0.8297777938	1.131050686
Hypothetical Mean Difference	0	
df	140	
P(T<=t) two tailed	0.0001122274801	Null Hypothesis Rejected

Table A.2.4 Two-Tailed t-test comparison of question #11 and #12 of art student's mindset of their independent disposable beverage reduction to the impact it would have on a global environment. The null hypothesis indicates that the art student population mindset would be similar for both concepts. The alternative hypothesis would suggest that the art students' mindset would differ between individual reduction and its effects on the global environment.

t-Test: Two-Tailed Sample: Art Independent vs Global		
	Independent	**Global**
Population (n)	34	34
Mean	4.294117647	3.588235294
Variance	0.9411764706	1.643493761
SD	0.9701425001	1.281988206
Hypothetical Mean Difference	0	
df	66	
P(T<=t) two tailed	0.002685333649	Null Hypothesis Rejected

Coded Data Counts of Categories of Long Answers

Table A.3.1 Raw counts of coded categories for Question 14 about Dalhousie supporting improvement of waste management techniques on campus. Answers were coded within the faculty of science (n=110) and art (n=35).

Faculty	Agree	Disagree	Positive	Negative
Science	6	44	10	50
Art	2	23	7	3

Table A.3.2 Raw counts of coded categories for Question 13 about wanting to personally change waste management behavior. Answers were coded within the categories of science (n=100) and art (n=38).

Faculty	Agree	Disagree	Positive	Negative

Science	38	15	37	10
Art	12	11	8	7

Table A.3.4 Raw counts of coded categories for Question 10 about experiencing social pressure surrounding waste management choices at Dalhousie. Answers were coded within the categories of science (n=97) and art (n=39).

Faculty	Agree	Disagree	Positive	Negative
Science	31	16	23	27
Art	10	11	7	11

Table A.3.5 Raw counts of coded categories for Question 6 about Environmental education affecting waste management choices at Dalhousie. Answers were coded within the categories of science (n=28) and art (n=18).

Faculty	Agree	Disagree	Neutral
Science	22	4	2
Art	12	5	1

APPENDIX B

Full Survey Questions

1) Are you a full-time undergrad student (in at least 3 classes - 9 credit hours) that considers your "main campus" to be Studley Campus (meaning you spend the majority of your time within the bounds of Studley campus compared to Carlton Campus and Sexton Campus)

- Yes
- No

2) Please enter your email address for a chance to win 1 of 7 DSS Environmental Affair Collapsible Straws
    - Short answer (for participant to enter their email)

If the above question is answered "no" the survey will have closed them out of the survey

3) What faculty is your major in?
    - Arts and Social Sciences
    - College of Continuing Education
    - Computer Science
    - Health Science
    - Management
    - Science
    - Other (fill in blank)

4) Have you ever purchased a reusable cup/bottles (examples being a water bottle or travel mug) since started studying at Dalhousie University?
    - Yes
    - No
    - Unsure

5) Have you received formal and/or informal environmental education from Dalhousie University regarding disposable cups?
    - Yes
    - No
    - Unsure

6) If yes, has environmental education that you received from Dalhousie University influenced your usage of disposable cups?
    - Long Answer

7) How often do you buy disposable beverage (plastic hot coffee cups, and the clear plastic cold drink cups) containers on campus?
   - 0 (never) to 5 (multiple times a day)

8) How often do you use a reusable beverage container (example being a travel mug) on-campus per week?
   - 0 (never) to 10 (everyday)

9) Once finished with your disposable cup, do you place your cup in any OTHER bin other than the one labeled "landfill" to dispose of this waste?
   - Yes
   - No
   - Unsure
   - Not applicable

10) Do you find that there are social pressures to adhere to on campus to bringing a reusable beverage container? If yes please explain why, if not, please explain why you feel that way.
   - Long answer

11) Reducing my disposable cup usage important to me
   - Strongly Disagree to Strongly Agree (5 choices)

12) Individual reduction of disposable cup usage will make a large change to the global environment
   - Strongly Disagree to Strongly Agree (5 choices)

13) How would you like to change your behaviour when it comes to disposable cup usage from your current behaviour patterns if at all? If you do not want to change your behaviour please explain why?
   - Long answer

14) Do you think Dalhousie University is creating enough awareness among students about reducing single-use waste that could be applied to disposable cup usage? For example, through informal campus education materials, peer conversations, or formal classroom environmental education. Please explain your reasoning and specify type if applicable.
    - Long answer

15) Would you support a ban on disposable cups on campus?
    - Yes
    - No
    - Maybe

APPENDIX C

Poster used to advertise to undergraduates' students Studley Campus to participate in the survey

APPENDIX D

Open-ended question results from the survey

Question #6: If yes, has environmental education that you received from Dalhousie University influenced your usage of disposable cups?

Science Students

- Yes, greatly
- Yes
- N/A
- Yes
- No
- Yes, but inly when I was in the course that I took. After that, the magic went away and I went back to usin disposable cups for awhile.
- Yes, I use less now knowing that the cups are not compostable and require a lot of resources to produce
- yes
- It did not change my view on my usage as I almost never use disposable cups
- yes
- Absolutely
- Yes, I always try to bring a water bottle/cup with me now
- yes. i bring my own water bottle every time i study on campus.
- Yes, I use it everyday now
- Yes
- Yes
- Yes
- YEs!
- N/a
- Yes
- Yes
- No
- Yes
- Yes
- Yes
- yes

- Yes! More education usually leads to better choices
- No
- No

Art Students

- Yes
- Yes
- Yes
- Yes
- No
- No
- My sust classes have helped me understand the enviormental impacts of waste
- no
- Yes and no. I often don't think ahead
- Yes, it has made me never want to use one again
- yes
- n/a
- N/a
- yes
- I stopped using disposable cups whenever possible
- Sustainability classes
- yes
- No. Just professors mentioning how important it is to reduce waster

Question #10: Do you find that there are social pressures to adhere to on campus to bringing a reusable beverage container? If yes please explain why, if not, please explain why you feel that way.

Science Students

- Not really. It is there but I don't consider it to be "pressure" as I am trying to limit my own disposable cup use anyway
- Yes
- Yes, I very rarely see people drinking from plastic water bottles. Almost everybody has a reusable water bottle and that makes me feel like I should be using one too.
- No- you see hundreds of people a day walking around with disposable tims cups, it seems that disposable is the norm more than reusable
- Yes, I think a lot of people judge you if you don't.
- Not really. I joke with my friends about saving the turtles every time we forget to bring a reusable straw, but I've never felt anyone judging me for not having a reusable straw or a reusable mug if we buy booster juice or tims.
- I personally say that there are no social pressures upon me when choosing which bin to throw my reusable beverage in. The reason why is because my friends are not looking at where I throw my cup, as they assume that I am throwing it out in the garage.
- Yes, to be more sustainable and create less waste
- N/A
- Both yes and no. I feel that you're more pressured to act in ways that are dictated by your social circle because these are the people you come into contact with more often.
- Yes, I find there's a lot of emphasis on reusables and on properly disposing of single use things. I definitely feel like people would judge me if I were to, say, bring a plastic water bottle to class, and that's a good thing!
- Yes definitely. I personally never have faced anything but a prof in one of my friends classes banned the use of non reusable cups in their classroom.
- Yes because there's so many water fountains
- No, I think most people are happy with disposable cups
- No, I do not feel there are social pressures. I think that the society around campus is not too much involved in the world, they are more so involved on trends or others. People just doing thier thing and don't have a care.
- I find that there are certain pressures (usually good) that encourage me to use reusable beverage containers. I find in places that offer discounts or actively state that they encourage reusable containers, I will feel guilty if I purchase a disposable cup and am

concerned that others around me will judge me for buying one when there are better alternatives.

- Yes as everyone is keen on recycling and the environment
- Yes
- Yes, whenever I am in one of my oceanography classes I feel like i would be judged if using a disposable cup because we all understand the waste it creates.
- yes, water bottles over single use cups
- Absolutely! The climate is changing! And everyone knows it! Everyone understands that you need to do your part and if you're seen slacking, there will be judgement.
- You're surrounded by vending machines, restaurants selling drinks. I always forget to bring a water bottle or don't have time to make coffee at home so it's more easily accessible since I'm on campus so often.
- Somewhat - I think there is an overall societal pressure that as a result is brought onto campus
- Yes, it's embarrassing to be rude to the planet
- No, I don't really see much about the importance of using reusable cups.
- i think its weird when people buy a plastic water bottle when there's literally so many options for reusable cups. there's no excuse anymore. coffee cups are still wasteful however i understand being in a rush and grabbing a quick coffee from tims more than i am understanding about a plastic water bottle.
- Not sure
- Yes, I think people have started to mention that a reusable mug could be used instead.
- I think since disposal cups are so common there's isn't any real pressure not to use one
- Sometimes yes, by people who care about the environment and other times not so much.
- Yes, I'm in environmental science and I feel judged and pressured to not be hypocritical and to simply use reusable items.
- No; I think most people still use disposable coffee cups frequently so I don't feel ashamed if I forget my travel mug. I do think people don't use disposable water bottles very much, and I feel embarrassed if I forget my water bottle.
- Not sure

- I haven’t experienced any pressure to use a reusable beverage container, although I recognize that others may have had different experiences
- Yes, for example in the SUB on wednesdays you can get free coffee only if you have your own reusable mug
- No I don’t think that there are social pressures but i think there should be
- No I feel they tell you that you have the option but theres no pressure
- Yes I believe there is pressure to bring a reusable beverage container because of all the scary stuff in the news about the climate crisis. The media has been putting pressure on everyone, including students, to start using reusable beverage containers whenever possible
- Yes because more people are becoming invested in being more sustainable
- Not really, because you are not required to bring a reusable cup and I have never been judged for using a disposable tims cup, many people do it !
- yes, some people are woke
- No
- Yes, it’s literally just a good thing to do, don’t be wasteful
- Yes, but in an encouraging way.
- I think in my social group (environmental science and sustainability) there is, as it is the normal for most people. However, I don’t think this is the case for the entire campus, as I have other friends whose normal is disposable cups and they do not see the issue with them.
- Yes
- Yes, due to my major and program, students are encouraged to use reusable mugs and bottles
- My friend group all uses reusable cups as well so there's pressure from them but it's largely an intrinsic drive
- Yeah, since I'm in environmental science I feel morally wrong and socially judged when I don't
- Yes. As an envs student, I feel like a hypocrite walking around with a disposable cup. Lots of pressure in envs/sust classes

- I think depending on your social circle and educational degree there are pressures, but there is not a huge campus pressure. The reduction in cost for bringing a reusable container is not enough and there are not enough pressures.
- Everyone seems on board with using reusable mugs
- yes, want people to know i care about the planet
- Sometimes yes, because there's a lot of conversation about reusing cups to save the environment
- Yes, sometimes I feel like I am being a pain to the food service providers by asking them to make my drink in my reusable container. It sometimes does not seem welcomed by them.
- There's a lot of theft of disposable cups. I would say it's encouraged to bring one through the free coffee morning and discounts, but I don't feel bad about buying a water bottle when I need to.
- No.
- Not directly, since many people use a reusable beverage containers I am often reminded this is an option. I do not feel pressured to use reusable containers from this reminder, but it is beneficial to know this option exists
- Not at all. I feel like there is more social pressure to buy a disposable cup, since everyone else is doing it. I think Tims is the source of most disposable cups on campus - they have a mobile order option which does not allow reusable mugs.

Art Students

- Not sure
- Yes, very liberal school
- No, not many posters telling to save containers
- Yes, but none that are overly invasive. I find that when I look around classrooms nearly everyone that brings water to class has done so in a reusable water bottle, and that those who don't kind of stand out from the crowd. While this may not being something that everyone notices, it has be refraining from ever buying a plastic bottle of water on the days that I might forget to bring my reuseable one. As for coffee cups, the only real pressure I find is from the garbage cans that say something along the lines of "all

disposable coffee cups can not be recycled and must be thrown out", I feel like they may have driven me to bring a reusable mug to campus more often.

- No - Most people use single use containers on campus which indicates that this is the "norm"
- No, I don't think people typically place judgement without knowing someone's situation
- I do think there are social pressures, as students are hyper aware of the current state of environment.
- Yes because it is 2020 and there is no reason for someone to not use a reusable cup
- Yes, but I believe this to be my own internal insecurity with relying on disposable cups for coffee
- I feel ashamed if I use a disposable cup in public
- No
- Sometimes, like in my Sustainability class.
- No because I don't see see enough incentive
- Yes, seeing other people with water bottles encourages me to.
- No
- No
- No, you only save money when you bring a disposable mug. Would be more of an incentive if you had to pay more to use a disposable one.
- No, I have never felt pressured to, but there is little reason not too with how easy it is to refill water/coffee.
- no garbage in classrooms anymore
- No. Most places have a mix of people with reusable and single use containers
- I think environmental pressures are significant.
- yes, within the sust program
- Yes. The Sust students are really aggressive
- Yes. but I would argue it is beneficial because it create awareness in new students that are coming. and it looks to be like there is a trend in university that it is more cool to have a reusable cup than not caring about the environment.
- Yes, it looks bad to carry single use plastics
- No

- Yes and its a good pressure.

Question #13: Are you inclined to change your disposable cup usage behaviour? Why or why not?

Science Students

- Yes because every little bit helps in environmental change
- yes because I would like to stop throwing away so much plastic
- Yes, I would like to use disposable cups even less in the future.
- Yes- I regularly bring a reusable cup but at times forget one (I have a hot bev one and a cold bev one) which leads me to buy a coffee in a disposable cup. I want to work to reduce this and never use disposable
- Yes
- I don't buy drinks often, but when I do I should remember to bring my own mug. I'm a marine bio student I know the horror stories and how it impacts humans too
- Yes I will be willing to change my behaviour when it comes to disposing disposable cups. The environment is an important place and as humans we need to maintain and take care of the environment.
- Yes, with the amount of affordable travel mugs out there, there isn't much of a reason to continue using disposable cups
- No. I barely use them.
- Yes, because I'm looking to both reduce my overall personal consumption as well as influence others around me.
- I only ever use reusable cups, water bottles etc. on campus except on the rare occasion that I forget to bring them with me
- I am. I want to help out the environment and this is an easy change to make
- No because I believe that one person does not really make a difference and it would have to be a government decision
- Every effort to help the environment is worth it

- Absolutely! I've been using my reusable water bottle and travel mug for quite awhile now and am very happy about the purchase. Not only will this improve the world's well being, but it will improve ours and our minds.
- I am inclined to use more reusable beverage containers, especially because there are more vendors that accept reusable containers and even places with mug libraries (which is great if you forget your container and are staying at the restaurant). My main issue is remembering to bring/clean my travel mug.
- Probably not as it is easy
- I'm trying, it's just hard to form the habit of bringing my water bottle.
- Yes
- I dont think i have anything to change. It is very rare that i have to purchase a disposable cup and that is when i forget my reusable cup at home.
- i hardly ever use disposable cups
- Absolutely - trying my best to transition more towards reusable everything. Important to take small steps that over time, make a big difference
- Yes, the more people that switch to reuse all the bigger the impact.
- Yes - I want to change my behaviour for myself and the environment, however, I think many have to change behaviour for an impact to be made
- Yes, it’s an easy way to make change and it’s not $$$
- Yes, I think it’s important to take any steps we can to aid the environment
- I am inclined because I care about the environment and I think that big changes start little by little so essentially every cup matters
- Yes, I want to reduce single use plastic wherever I can
- No, because I already use a reusable cup everyday.
- Yes, because the difference I can make with my waste consumption is small but it’s something I can do to help the environment. So I try to use the least amount of disposable cups as I can.
- Yes. They are wasteful and unnecessary. There are alternatives to them which are very easy to use
- Yes to save the turtles sksksksks
- Yes, I know I need to better my habits to better the environment

- Yes, because it is wasteful to use single use products in general and disposable cups fall under that umbrella.
- Yes because any bit helps
- Yes, because I believe climate change is an important issue and it's hard to ask politicians to effect major changes if you aren't willing to make minor ones
- I would like to make a habit of using my reusable mugs more often.
- Yes because i'm taking this survey
- Yes I want to use less disposable cups
- Yes because I would like to avoid using disposable cups altogether to help out the environment in whatever way I can. Plus avoiding use of disposable cups is such an easy way to do so!
- I already don't consume them as much as possible
- Yes because it feels good knowing you are contributing less waste.
- Yes
- Yes, i don't like creating unnecessary waste. I just need to remember to bring my mug!
- I wanna be woke
- I already use
- It's a good thing to do, we don't need to be wasteful
- Yes, it is a small behavioral change but everything matters
- I already avoid using disposable cups and I plan to keep doing so
- No, I am pretty good for not using disposable cups
- Yes, I aim to use more reusable containers
- I've been trying to reduce the number of cups I use because of waste I could divert from landfill.
- No, I try my best already!
- Yes. It's such an easy fix I can't see why you wouldn't
- Yes because its unnecessary waste
- because i want to do my part for the environment
- Yes I try to use a reusable cup when I can, but sometimes I just forget
- Yes, reducing waste is very important to me and often a simple thing to do! I don't want to see any more useless waste in our oceans and on our shorelines.

- No. I already limit my use of disposable cups
- Yes. It would be much easier if I had a reusable mug but I currently do not have one so I tend to buy disposable cups if I get coffee
- Since I do not often use disposable cups besides when no other option exists, I'm not inclined to change my behaviour.
- I make an effort to do my part and reduce personal waste on a daily basis. However, I don't think it's the consumer's responsibility to "save the world" and reduce emissions - this is up to the producers and major corporations. We as individuals make a very small environmental impact. For this reason, I'm not really motivated to reduce my usage of disposable cups. Although personal sustainable choices can make a tiny impact, I guess just subconsciously I feel like I'm not doing anything to help, so I continue to buy disposable cups.

Art Students

- No because I always carry my reusable cup with me
- Yes because it’s my controlled way to help the environment
- Yes, always to save the environment
- No, because I already bring a reusable mug with me over 90% of the time that I am out of the house and while I wish I could be the perfect person who always brings my mug with me, I don't want to beat myself up over the times that I don't or decide that because I didn't bring a reusable container for that random coffee that I'm craving I shouldn't get one.
- Yes - I would like to reduce my general waste and disposable cups are an easy area to target
- No because I already limit my disposable cup intake
- Yes I am - I want to try harder to reduce my single-use waste.
- Yes because it is not good for the environment
- Yes but sometimes it feels like an afterthought
- I changed this last year
- Yes. To save money and produce less waste
- Yes! I try to bring my own cups.

- I try but sometimes you just need an iced coffee.
- Hypothetically yes but I never bring my cup with me
- Yes. To save money and produce less waste
- I question how large I alone can have an impact but I still think it's important
- Yes, because it is a behavioural issue (for me) it can be accessed as well for some people and if I can not use them, I won't.
- No, I only use disposable cups if I absolutely must.
- yes I try to remember reusable cups, sometimes forget. unable to refill at the moment because of coronavirus
- Yes. I continue to refrain from using disposable goods as much as possible and want to continue to improve.
- No convenience drives my choice
- Yes. I am working on it by trying to bring my travel mug to school everyday.
- No, I do not use disposable cups.
- Nope. I already use very few cups
- I'm already using only my reusable cup so I need to start looking at other things I can reduce my waster on.
- No.
- I am using a mason jar as my reusable mug instead of buying one in order to reduce additional waste of buying a reusable cup

Question #14: Do you think Dalhousie University is creating enough awareness among students about reducing single-use waste that could be applied to disposable cup usage? For example, through informal campus education materials, peer conversations, or formal classroom environmental education. Please explain your reasoning and specify type if applicable.

Science Students

- In a way yes, but in other ways no. I haven't received any formal education in classes, but from various groups on campus and some official information through the university. As of now, it is enough, though I think it could be better

- No
- No they can do more to get people to bring their own reusable container.
- no, the best I've seen is a poster in the bathroom or ESS has a table in the LSC.
- No, I can't remember ever seeing informal campus education materials and I haven't received any formal classroom education regarding the issue.
- No, I haven't really seen any push from Dalhousie to do so at all
- No
- No. You don't see any campaign anywhere saying to be better or any discounts.
- As a student I do not think that Dalhousie is doing enough when it comes to engaging in students about disposable cups. The reason why I think that is because even sometimes I am aware of what I am throwing out in the garage and caring if it does belong to the right bin.
- No, the knowledge I have about disposable cups is from other sources excluding Dalhousie
- No
- No. I have encountered many students who are not aware of the ways that they can make themselves more environmentally conscious in their daily lives. Students, especially those who live off-campus, are less likely to attend on-campus events. I believe that students should get in-class education on how to be more eco-conscious and how they impact the Earth.
- I don't think I've ever actually seen anything from Dal itself about reducing single-use waste, but for the majority of people the best way to encourage it is probably to incentivize it (ie. extra charge for single-use waste, discounts or reward programs for people using reusables, etc)
- I think there should be more awareness. Maybe giving out free cups, increasing the social media awareness of the benefits etc
- No, they only care about money
- No. Most cafes on campus have no alternative to single use ups.
- No, I don't feel that dal pushes for more awareness. Considering their rather small green walls and only providing expensive restaurants that also sell branded travel mugs that over half of the campus can't afford, I don't think they are even trying. Yeah sure, we can

go buy a travel mug at another cheap store - but that's outside campus. Campus is doing nothing about sustainable living.

- I think that Dalhousie should have more active conversations about single use waste (including beverage containers) and that more information about it should be shared in classrooms, residences, and at vendors. Most information I have about this topic was learned on my own time, and I know that many people do not understand all that goes into coffee cup production (including mass resource waste that occurs) and how much of an impact disposable beverage containers make on the environment.
- I see the signs they have posted. So I feel like they are definitely making an effort, but it's getting people to notice the signs. After a while you start to ignore them as they become part of the background. (Maybe changing them up every few weeks would keep the attention of staff and students.)
- Could be more (for example I still use disposable cups on occasion - may be less inclined to do so if more education materials right around those establishments too)
- No, I definitely think more can be done. I think both formal and informal education would be a good way to do so
- yes, i have seen a lot of information about sustainability arising from using recyclable bottles/ cups
- No - certainly more could be done. More than just passive aggressive signs above the recycling bins (although i do love the photo of Greta that was above the recycling bin in the tunnel between the LSC and the library)
- No, and I say this because I haven’t heard anything about the topic since coming here in September 2019.
- No - I hear very little about anything regarding the topic
- No
- No, there should be more education available and brought to each class. Especially on proper waste disposal of cups
- No. I think its great that theres a reusable mug station at second cup in the killam, however there isn't nearly enough conversation about it throughout campus.
- Formal classroom education (not just for ENVS students) would be beneficial

- I think there is quite a bit from peer conversation, and classes in sustainability or science degrees particularly. I still think more could be done such as notices around campuses suggesting the use of reusable cups to broaden the reach.
- I don't think Dal is raising enough awareness. They should start charging students for disposable cups bought at on-campus vendors (even 5 or 10 cents) and educating students more about the environment and reducing waste.
- No. I feel that as a school which claims to be environmentally conscious, there is almost no formal education on disposable cups. To date, I have had extra one professor talk to the class about cups, although the ban of them in their classroom is not enforced
- Sometimes
- There's wonderful education on this topic if you are in ENVS or SUST, but otherwise I feel like it's not often promoted nor discussed
- No; I don't recall getting information about that from the university.
- No
- I haven't really experienced any education at dal about disposable cup usage. There definitely could be more
- I do not think that Dal is providing enough education. I have not received any lessons on waste management in any of my science classes, let alone my electives.
- No I don't think there is enough awareness because all the businesses on campus still use one use cups and this is the first time i've really heard of reducing this
- Yes I've learned about the environmental impact of disposable cups in my classes
- No I do not think they are. I've personally never come across anything on campus specific to reducing single-use waste
- I would like it if they got more practica reusable mugs in the Killam (currently breakable, uncovered, heavy mugs that you're not supposed to bring upstairs).
- I think they could definitely be doing a better job, but I think students can also be very lazy and their habits might be difficult to change.
- No
- I think they are doing an okay job by giving students an incentive to use a travel mug for example, getting the .20 cents off at Pete's. However, I think they could charge extra if you're not using a reusable cup.

- Yes bring your own mug for free coffee
- I don't think they're doing enough, grille works or food vendors should offer incentives for bringing reusable containers. Or the university should match the reusable cup discount
- No, there's some but not enough
- As a whole I think no. I have found there is a lack in general knowledge regarding waste management, which makes me think that dal is not creating enough awareness
- No
- No, campus should provide more reusable mugs for students and try to reduce any excuses from the customers from not using a reusable containers on campus
- Yes
- NO. I think there should be more incentives/de-incentivising. Should have more posters/infographics in public places. Bathroom, classrooms, etc
- No. I wish that dal put more pressure on students to bring their mugs. Students are lazy and need to be incentivized
- Big corporations that are present on campus also are not providing the pressure. Groups on campus also don't provide the pressure. While there are some accessibility matters that are important, this should also be incorporated into pressure. People also do not feel the urgency and do not see where their cups are going, so there is not pressure.
- Nope
- no
- Yes I do think Dalhousie is
- No, I feel that more could be done by Dal. Often times, waste reduction strategies and tips are kickstarted by students or student societies. It would mean a lot if Dal initiated some of the more applicable initiatives, especially with their reach on campus. Also incentivizing food providers for them to encourage less waste would be helpful!
- Yes. The issue with disposable cup use is not about awareness. A better idea would be to implement some sort of policy so that people can borrow a reusable mug (e.g. while they're eating in the DSU). I would guess most of the disposable cup purchases are because that's the only option available to the person at that time.
- No

- I don't think so, but the approach would have to be carefully considered In my opinion creating emails and other methods similar are ineffective, though a classroom approach would work best out of these I believe.
- No. I rarely see posters, announcements, etc. regarding the topic of disposable cups. The mug program at the Killam Second Cup is the only thing I can think of.

Art Students

- No??
- No
- Not enough
- I don't think education is what is needed at this point, I believe the vast majority of students at Dal understand, at some level, that single-use plastic is bad. I'd rather see Dal invest the time and money in creating action plans on how to reduce the use of single-use cups rather than expect the students to take that initiative after being taught something they probably already know.
- No
- Yes
- I don’t think they are - I have never received any information, be it formal or informal about reducing single-use waste from Dal.
- No because I don’t see any type of promotion when it comes to using reusable cups, there’s not enough information around campus to let other people know the implications of disposable cups
- I only hear about it occasionally in my sustainability lectures or when there is free coffee in the SUB
- Not really
- No
- Not really. 10 cents is absolutely nothing as a reward to bring your own cup. I just think there should be more awareness in general
- Maybe not, because I'm still a little unsure which bin to put it in.
- Dal does not care
- No

- No, Dal doesn’t care
- no, not enough incentives or education
- No, I cannot remember the last time I was made aware of Dalhousie working to reduce the use of single use cups. There seems too be very little focus on the issue from Dal.
- yes, I think enviro groups are doing a good job. didnt appreciate signage about accessible doors. ableist and invisible disability-shaming
- No. It should be information that everyone has and is common knowledge.
- not enough. most of the awareness comes from students societies rather than university itself.
- No, they could promote and facilitate it better
- Nope. We should just stop selling disposable cups.
- Not at all, if you are not a sustainability students it more likely you will not be that aware. unless you are social active in university. i think it is important for every faculty to make their students take a first and second year sustainability courses.
- No. More travel mugs should be sold on campus for a cheaper price
- No.
- absolutely NOT

APPENDIX E

Raw numerical data results from the survey's closed-end questions.

For the questions on purchasing (Question #4), received environmental education (Question #5), bin placement (Question #9) and ban of disposable cups on campus (Question #15) the following code was used:

Yes: 1

No: 0

Unsure / Maybe: 0.5

Not Applicable: left blank

Table E.1.1 Science Students' Results from Questions # 3, 4, 5, 7, 8, 9, 11, 12, 15

Program	Purchasing	Received Environmental Education	Buy Disposable (0-5)	Use Reusable (0-10)	Bin Placement	Reduce Impact (1-5)	Global Change (1-5)	Ban
Science	1	1	0	10	0	5	5	1
Science	1	0	3	2	0	2	2	1
Science	1	0	2	9	1	4	3	1
Science/ Double with FASS	1	0	1	10	0	5	3	1
Science	0	0	2	5	1	3	3	1
Science	0	0	0	10	0.5	4	5	1
Science	0	0	1	1	0	4	4	1

Science	0	0	2	8	0	4	3	1
Science	0	0	1	7	0	4	4	0
Science	1	1	1	10	1	5	3	1
Science	1	0.5	1	10	1	4	3	0
Science	1	0	3	4	0	4	4	0.5
Science	1	0	3	10	0	2	5	1
Science	1	0	0	10	0	5	4	1
Science	1	1	0	10	1	5	5	1
Science	1	1	0	0	0	5	4	1
Science	1	0	2	9	0	3	1	0
Science	1	0	1	1	0	3	4	1
Science	1	1	3	6	0	4	3	0.5
Science	1	1	1	10	0	5	5	1
Science	1	1	0	10	0.5	5	5	1
Science	1	1	2	6	0	5	2	1
Science	1	0	1	10	0	4	5	0.5
Science	1	0	3	0	1	5	4	1
Science	1	0	2	8	0	3	4	0
Science	1	0	1	1	0	5	5	0.5
Science	1	1	1	10	0	5	4	1
Science	1	1	2	10	1	5	3	1
Science	1	0.5	2	7	0	5	5	1

Science	1	1	0	10		5	4	1
Science	1	0	1	3	0.5	4	4	1
Science	1	1	1	10	1	5	5	1
Science	1	1	4	8	0.5	4	5	0
Science	1	1	4	1	0	5	4	1
Science	1	0	1	10	0	5	3	1
Science	1	0	3	1	0	4	1	0
Science	1	0	2	6	1	4	3	0.5
Science	1	0	1	10	1	4	4	0.5
Science	1	0	2	8	0	3	4	1
Science	1	0.5	1	9	1	5	4	1
Science	1	0	1	10	0	4	4	1
Science	1	1	1	5	0	5	3	0
Science	1	0.5	2	1	0	5	3	0.5
Science	1	1	1	2	0	4	5	0.5
Science	1	0	3	6	0	5	2	0.5
Science	1	0	4	1	0	5	5	1
Science	1	0	2	7	0	5	5	1
Science	1	1	1	10	0	5	4	0.5
Science	1	0	2	6	0	4	4	1
Science	0	0	2	7	0	5	3	1
Science	1	1	0	9		5	3	1

Science	1	1	0	9	0	5	3	1
Science	1	1	1	8	0	4	3	0.5
Science	1	1	1	8	0	5	5	1
Science	1	1	0	10	0	5	2	0.5
Science	1	1	1	10	1	5	4	1
Science	1	1	0	4		5	2	1
Science	1	1	0	5	0	5	4	1
Science	1	0	2	7	0	5	1	1
Health	1	0.5	1	5	0	5	3	0.5
Health	1	0.5	2	0	1	3	4	0.5
Health	1	0	1	9	1	5	2	1
Health	1	0.5	1	8	0	3	4	0
Comp Sci	1	0	4	6	0	3	5	1
Comp Sci	1	0	1	7	1	5	4	1
Comp Sci	1	0.5	1	8	0	3	3	0
Comp Sci	1	0.5	3	2	1	3	5	1
Comp Sci	1	0	2	10	0	4	1	1

Table E.1.2 Art Student Results from Questions # 3, 4, 5, 7, 8, 9, 11, 12, 15

Program	Purchasing	Received Environmental Education	Buy Disposable (0-5)	Use Reusable (0-10)	Bin Placement	Reduce Impact (1-5)	Global Change (1-5)	Ban
Arts and SS	1	1	1	10	0	5	5	1
Arts and SS	0	0.5	0	0	0	3	4	0.5
Arts and SS	1	1	1	8	0.5	5	5	1
Arts and SS	1	0	3	5	0	5	2	0.5
Arts and SS	0	1	1	9	0	5	4	1
Arts and SS	1	0	1	10	0	4	3	0.5
Arts and SS	1	1	2	4	0	5	4	1
Arts and SS	1	1	1	9	0	4	4	0
Arts and SS	1	1	5	0	1	4	2	1
Arts and SS	1	0	3	8	1	4	3	0.5
Arts and SS	1	0	4	10	0	5	5	1
Arts and SS	1	0.5	3	10	1	4	1	0.5
Arts and SS	1	0	1	10	0	5	5	1
Arts and SS	1	0	2	9	0	5	4	1
Arts and SS	1	1	2	9	0	5	5	1
Arts and SS	1	0.5	1	10	1	4	3	0.5
Arts and SS	1	0	4	2	0	3	2	0.5
Arts and SS	1	0	1	8	0	5	4	1

Arts and SS	1	0	2	9	0	5	4	1
Arts and SS	1	1	3	6	1	4	2	0.5
Arts and SS	0	1	0	10		5	5	0.5
Law	1	0	1	10		5	3	0
Social Work			1	5	0	5	3	0.5
Management	1	0	2	10	1	2	5	0
Management	1	0	1	8	1	5	5	1
Management	1	0	4	3	1	2	1	0
Management	1	0	3	10	0	2	3	0
Architecture	1	0	1	5	0.5	4	5	1
Architecture and Planning	1	1	0	10	0	5	2	1
Architecture and Planning	0	1	0	10		4	2	1
Architecture and Planning	1	1	0	10	1	5	5	1
Planning	1	1	0	10		5	4	1
Planning (CD)	1	1	3	5	1	3	3	1
Planning (Urban)	0	0	0	10	0.5	5	5	1