Waste Initiatives-UTSC

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Research Topic: Determine whether initiatives at UTSC are effective, awareness of waste initiatives and sustainable goals on campus, and improvements to the current waste management situation.

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Final Report

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Abstract

The paper looks at sustainability and initiatives implemented at UTSC. The main objectives of this paper are to determine whether initiatives at UTSC are effective, awareness of waste initiatives and sustainable goals on campus, and improvements to the current waste management situation. Data was retrieved via Waste Audit Canada, UTSC waste reduction, UTSC sustainability office, and via interviews with students and campus staff. Results showed the most successful initiative was the use of water fountains; a lack of knowledge of eco-containers, their prices, and how to purchase them; and the improper disposal of waste by some students.WAC (Waste audit Canada, 2018) found the total waste generated, and the total waste to landfill mainly consisted of organics waste (57.63 kg). Additionally, WAC found to improve waste diversion from landfills, UTSC would need to combat organic waste management (which was the greatest contributor) since 15.89kg (27.57%) of organic waste out of a total of 57.63 kg was incorrectly disposed of in the mixed recycling stream. Our hypothesis was supported; UTSC is not very sustainable when it comes to waste due to a lack of waste disposal knowledge (i.e., incorrect disposal of waste in bins), leading to an increase in waste sent to landfill, and a lack or inefficiently of waste initiatives (i.e., organic waste bins, and eco-containers) implemented on campus.

Keywords

Waste, Recycle, Initiatives, Eco-Containers, Reusable Bottles, the Waste diversion rate

Introduction

Sustainability is defined as meeting the needs of the present without compromising the ability of future generations to meet their needs. Industrialization and urbanization around the world have resulted in enormous production of both biodegradable and non-biodegradable waste, or unwanted materials which eventually piles up in landfills (Bharadwaj et al, 2015). We have adapted to the changing lifestyle involving the consumption pattern with "use and throw" products, because of which we now produce an estimation of 400 gms of waste or garbage per person per day (Bharadwaj et al, 2011).

The University of Toronto first launched its sustainability office in 2007 with the sole purpose of informing staff, faculty members, and students about initiatives, information and resources on sustainability. An audit was done in February 2018 to provide the university with solutions to increasing diversion rate, ease of handling and collecting waste in compliance with Ontario Regulation (Waste audit Canada, 2018). This regulation ensures educational institutions implement waste disposal measures prior to the removal of materials to the site; such as paper, aluminum, food and beverage cans, newsprint and cardboard (Waste audit Canada, 2018). In the year 2007, UTSC generated a total of 520 000kg/yr of waste which encouraged the response of several waste initiatives. (Lang, 2007) Currently, U of T has 11 waste streams which include garbage, paper, cardboard, scrap metal, wood, e-waste, organic waste, yard waste, lamps, confidential Paper, and Cans/Bottles/Glass (Lang, 2007). The university has made it their duty to find innovative ways to reuse, reduce, repair and recycle. The University of Toronto has announced the low-carbon action plan in September 2019 which stated that it is going to reduce 37% of the greenhouse gas emissions by 2030 and lower the annual emissions to 73684 tonnes.(Low Carbon Action Plan, 2019). Also, in the future, it is wishing to become a "net-zero" institution (Kalvapalle, 2009). With

all the new development projects, it is going to reduce more than 8500 tones in GHG emissions (Ng, 2019). In UTSC, the initiative centers mostly on Eco containers, water bottle free programs, and free storage.

Our focus in this paper is to determine how waste initiatives are implemented and how successful the university was able to instrument these initiatives. There will also be a focus on how to educate the campus and be proactive with the waste management initiatives that are implemented. In addition, other possible initiatives that could be effective will also be proposed. Our research question for our study is, how successful is UTSC regarding waste initiatives, and what aspects of these initiatives can be improved? Based on research conducted, the UTSC campus has improved its waste generation since 2007 but there are still waste initiatives that are not done efficiently or effectively. Our hypothesis will be supported by data suggesting incorrect disposal of organic waste, an increase in waste sent to landfills, and a lack of effectiveness of waste initiatives (i.e., organic waste bins, and eco-containers) implemented on campus.

Methods

The research was done using the 2018 UTSC audit report, and the campus sustainability sites on how eco containers and other initiatives are used to help reduce waste. We focused on the 2018 UTSC audit report that included a four-step process examining waste generated during a 24-hour period in a staging area, between February 13-14 of 2018 by Waste Audit Canada (Waste audit Canada, 2018). The first step included a site review which looked at when waste was generated, and how it was handled. They investigated how the waste was sorted in groups based on general waste, source, separated recyclables, organic, and other composition of materials, which was performed within the building management

before waste samples were examined (Waste audit Canada, 2018). This was followed by step 2 which classified waste generated and the weighing of materials (Waste audit Canada, 2018). Step 3 included waste examination via on-site analysis, and discussions with building management (Waste audit Canada, 2018). The final step 4 included measuring the progress of recycling initiatives, and recommendations were provided to increase diversion from landfill, and improve waste and recycling processes (Waste audit Canada, 2018).

In order to process the research on how the initiatives on dealing with the waste have changed our campus, additional data was collected for more information other than what is already on the UTSC website. To get additional information the campus sustainability department was contacted, and an enquiry was sent in. Supplementary research was conducted at BV Tim Hortons, Starbucks, Student Center, Market Place and near water fountains where most of the campus tends to consume most of their drinks and meals. Interviews were conducted with employees in the cafeterias on campus. Such interview questions included: Are you aware of the eco-containers program on campus? Can we purchase an eco-container here in the marketplace? What is the price of the rental of the eco containers? A randomized set of approximately 100 students were interviewed regarding eco-containers and reusable bottles: Do you know there is a promotion on using the reusable bottle for buying a drink? Do you often bring your own bottle to school? What makes you not want to use your own bottle? An additional investigation was also conducted on the use of double-sided printing to reduce paper waste on campus: Do you know that printing on the double side will reduce paper waste? What makes you need to print on one side per paper? See Figure 1 in the Appendix .Analyzing the data from these locations will be the main procedure of this project.

Results and Discussion

The most successful initiative implemented at all three UofT campuses including UTSC is the use of water fountains. In 2011, UofT joined several other universities in Canada in the *water bottle-free campus*. (Hotton, 2016) Although bottled water was not completely banned on the UTSC campus, after Oct. 31, 2011, bottled water was not provided at university functions, sold in vending machines or by on-campus restaurants and vendors.(UTSC OnTap,2019). This proved to be effective as upon observation many students brought in their reusable bottles to use these fountains. Recently, hot water fountains were placed in a few buildings (IC and Student Center) to again encourage the use of reusable cups.

UTSC also started the *lug a mug* initiative to use your own reusable mug to help reduce coffee cup waste on campus. This is further reinvigorated by including an incentive of a discount at places including Starbucks, marketplace and Tim Hortons. Upon investigation on the effectiveness of Starbucks and Tim Horton's offering 10% discounts to individuals who brought their own bottle, we observed, only 10% of people brought their own bottle. After the interviews, the reason in which individuals were not willing to carry their bottles was that 60% of the students had one water bottle and would like to have coffee and a drink at the same time. Another 30% of the student doesn't want to wash their water bottle after they have coffee and 10% of the students don't want to bring their own water bottle to school. In comparison to Tim Hortons and Marketplace, Starbucks has put a significant effort into the promotion of reusable bottles and containers. The BV Tim Hortons location, however, had a lack of promotion of eco-containers and reusable bottles showcased on the racks. Most of the drinks and food packing in this location interact with a significant amount of plastics and paper products. The marketplace is the main location stated on the UTSC sustainability

website for the rental of eco-containers. However, when interviewing staff there, there was no knowledge of these eco-containers along with their prices and how to purchase them.This proves a lack of knowledge on the eco containers initiatives in this location. One of the biggest food centers on the UTSC campus is in the student center. Fast food restaurants have nothing in relation to waste management according to university sustainability practices. Restaurants in the SCSU had one of the biggest footprints based on our research compared to the other locations as they used the most waste and had a lack of sustainability practices.Whereas other locations supported the use of reusable cups , mugs and bottles, they continuously served in throw away cups.

Another waste management initiative to ensure that waste is stored correctly was the placement of garbage bins on the campus within 3-5 meters of each other. Every garbage bin on the campus has categorized the waste: Litter, Recycle, Recycle or Green Waste. Nevertheless, a major problem in the university is the improper disposal of some students. The Green waste section is for the disposal of food waste, napkins and paper towel compostable items.

UTSC has also incorporated a reduce, reuse and recycle initiative on its campus. The purpose to reduce on campus was to allow for faculty and staff to strive towards environmental consciousness by reducing the amount of paper that is used. The majority of the settings for printers are set for double sided student printing which started from a project on campus called UTSC Green Course. When investigating this initiative, we observed that about 20 students didn't want to print on the double side because their assignments required single-sided. Considering the UTSC Green course, the UTSC website only updated to 2017, and there is no Environmental science course included. In classes where professors are taking attendance for lectures and tutorials, there is the use of at least 1 piece of paper for marking

the attendance. This could be reduced by changing the format of these attendances to online. Reusing is observed on campus by restaurants and café giving discounts to customers who bring their own reusable bottles.

On-campus, there is an eco-container program, encouraging students to use reusable eco takeout food containers, which can be used to save the amounts of the plastic container consumed. To recycle the university started the Free Store Program, which is a recycling initiative that allows the student to donate unwanted housing items and pick up items that they want free of charge. During the Free store program, it contains lamps, Kitchen Appliances, etc. which is usually beneficial for the new resident student, and it also reduces the toxicity of the landfill of electronic waste.

Within U of T, staff or contractors pick up majority of the 11 waste streams (Garbage, Cans/Bottles/Glass, Paper, Cardboard, Scrap Metal, Wood, E-Waste, Organic Waste, Yard Waste, Lamps, and Confidential Paper), dropped off at the service tunnels (Lang, 2007). Despite the lack of education on waste management practices around campus compared to the year 2007 in which 520 000kg/yr of waste was produced, based on measurements for 2018 this amount has gone down. (Lang,2007) .As the school has become significantly more conscious of climate change, waste has been lowered to 125kg/yr as of statistics for 2018. Referring to table 1 in appendix, WAC (Waste audit Canada, 2018) found the total waste generated, and the total was to landfill mainly consisted of Organics waste (57.63 kg). Additionally, WAC found to improve waste diversion from landfill, UTSC would need to combat organic waste management (which was the greatest contributor), since 15.89kg (27.57%) of organic waste out of a total of 57.63 kg was incorrectly disposed in the mixed recycling stream (Waste audit Canada, 2018). Referring to chart 1 in appendix, it was found organics (75.99%), followed by paper towels (8.94%), followed by coffee cups (5.74%),

followed by disposable food packaging (3.63%) were the main contributors to contamination in the mixed recycling stream (Waste audit Canada, 2018). Additionally, in the mixed recycling stream, 20.53% of waste to landfill was non-divertible, whereas 16.44% of the total waste generated was non-divertible (Waste audit Canada, 2018). Compost bin in student center, and in SY building and E-Waste Battery Bin at SW120 for graduates to ensure the proper disposal of these waste ("The UTSC Sustainability Office," n.d.).

The main issue recognized within the university was the lack of education regarding waste initiatives around campus, and the lack of knowledge and information on bulletin boards about various initiatives measures. There was also a lack of implementation of some of the initiatives that were described by the university such as, eco containers. The UTSC campus had an absence of information informing every student and staff of the benefit and reward of following these initiatives, and everyone's impact on sustainable development.

Recommendations (for policy and/or practice):

Our recommendation to improve waste management on campus is to introduce new initiatives that are more effective than what is now in place such as the eco container. An initiative that could be included at the location involved in 'Lug a mug" is after 10 drinks, possibly one for free. Another recommendation is to completely ban the sale of water bottles altogether across campus as Marketplace still sells a few bottles. There should also be more education on waste initiatives around campus such as on bulletin boards and cash desks. We also recommend that the university become more proactive with the waste initiative by having teaching lessons to students who are not involved in sustainability courses. Attempt to recycle 75% of construction waste on all major capital projects & Reduce construction debris.

The following four recommendations were provided by WAC to dispose of waste correctly and reduce waste to landfills for the UTSC campus. First, environmental training of waste and recycling procedures should be provided as a result of there being mixed recycling in the waste to landfill stream (Waste audit Canada, 2018). In addition, the current diversion rate at UTSC would increase to 21.67% from 19.93%, if 50% of the material was placed in the mixed recycling stream (Waste audit Canada, 2018). This is comparable to the University of British Columbia who has a Zero Waste Target Plan that targets 80% overall waste diversion by 2020. Second, There should be an organics recycling program expansion at the market place as a result of 74.46% of organic contamination in the mixed recycling stream due to the absence of organic bins in the food court and surrounding area (Waste audit Canada, 2018). Third, In the mixed recycling stream, there were 120 coffee cups (out of 373 coffee cups) incorrectly placed (Waste audit Canada, 2018). Fourth, waste tracking would be a great system to implement at UTSC to assist in improving management decisions, and preventing additional processing costs associated with waste, by tracking both waste weight, and the removal of recycling (Waste audit Canada, 2018). Accurate and reliable monthly data would be retrieved from this system (Waste audit Canada, 2018).

In addition, good initiatives need people to promote and supervise. UTSC does have some effective initiatives, but the sustainability department did not execute them very well. It should be suggested that the sustainability department should pay more attention to supervising and investigating waste initiatives on campus, and do more research on how to improve the waste problem. Other than this, a student sustainable organization should be established to broadcast new initiatives and the benefit of following those initiatives. With strong supervision and publicity, effective policies will play the maximum role.

Conclusion

In a word, UTSC is trying to approach sustainable goals by proposing waste initiatives, but it seems these initiatives are not working out. Our hypothesis was supported; UTSC is not very sustainable when it comes to waste due to a lack of waste disposal knowledge (i.e., incorrect disposal of waste in bins), leading to an increase in waste sent to landfill, and a lack of waste initiatives (i.e., organic waste bins) not implemented on campus. Firstly, the staff who work in the sustainable office did not take waste management as a serious problem. Secondly, waste management is a broad problem and faces tremendous challenges to promote it. Thirdly, current initiatives are not effective and not enough to change the status of waste on campus. More initiatives are needed to make the campus more sustainable. Future research regarding waste at UTSC should look at whether men or women are more likely to follow waste initiatives (i.e., recycling) on campus, and should apply initiatives recommended (as indicated above), to reduce waste to landfill, as well as, raise awareness via brochures and posters encouraging proper disposal of materials.

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Appendices

Questionnaire-Waste initiatives in UTSC

- Eco-containers and reusable bottles

1. Do you know there is a promotion on using the reusable bottle for buying a drink?
2. Do you often bring your own bottle to school?
3. What makes you not want to use your own bottle?

- double-sided printing

1. Do you know that printing on the double side will reduce paper waste?
2. What makes you need to print on one side per paper?

Figure 1: Questionnaire we used around campus to collect data from students, learn how much they knew about waste initiatives on campus.

Description	Value
Total Waste Generated	**125.00 kg**
Total Waste to Landfill	**100.09 kg**
Total Waste Diverted	**24.91 kg**
Percent Diversion from Landfill	**19.93%**
Capture Rate	**85.11%**

Table 1: Diversion summary measure in kilograms (kg) during the 24 hour period retrieved from (Waste audit Canada, 2018).

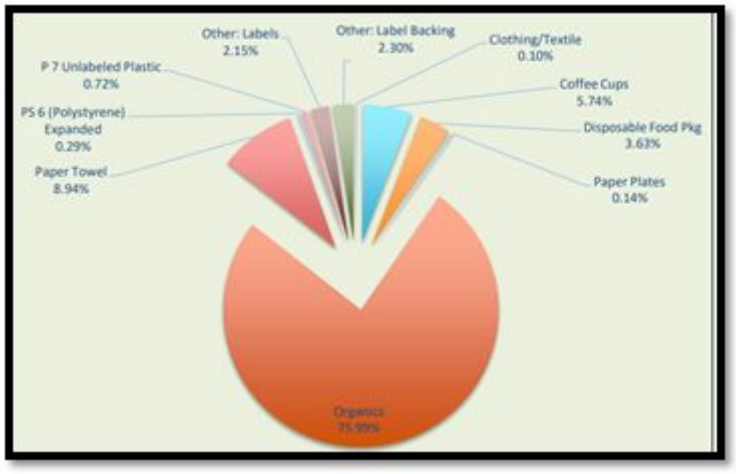

Chart 1: Summary chart of main contaminants in the mixed recycling stream retrieved from (Waste audit Canada, 2018).