Understanding Water Bottle Behavior of Students

Environ 391: Sustainability and the Campus Winter 2011 University of Michigan



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Executive Summary

The push for a sustainable University of Michigan campus requires changing behaviors that negatively impact the environment. Bottled water is associated with many environmental and social problems around the world. The goal of the Water Bottle Behavior team was to collect and analyze a substantial set of data in order to determine student water bottle behavior on the University of Michigan campus. Determining the behaviors of students regarding disposable and reusable water bottles and identifying effective methods to decrease bottled water consumption is a step toward fostering a more sustainable lifestyle on campus. We worked to promote sustainable water use on campus with both our sponsors, Amy Harris and Manja Holland, along with our partnership with LSA's Winter 2011 Water Theme Semester.

Our data collection methods included a focus group, interviews, and surveys from over 300 University of Michigan students. We distributed reusable water bottles and fact sheets in hopes to discover which materials are most effective in encouraging students to use reusable water bottles. We gave a visual presentation to a class to study the effects of this type of education on student bottled water consumption. We also surveyed a group of students in a living/learning community who received a free reusable water bottle at the beginning of the academic year. In addition to surveys, focus groups and interviews were conducted in order to better understand thought processes behind water bottle usage. Through these various research techniques, we were able to identify which methods were most successful in changing behavior.

Throughout our various research projects we noticed recurring trends. We found that it is inconvenient for students to clean their reusable water bottles particularly in the residence halls. Our results indicated that there is a lack of education regarding the quality and safety of Ann Arbor's tap water among the University's students. Peer influence was found to effect student water bottle behavior. In addition, we discovered that providing free reusable water bottles to students and educating students through visual means can effectively change behavior.

Based on our results, we have developed the following recommendations to help motivate U of M students use reusable water bottles instead of purchasing bottled water:

- We recommend that University Housing install more cleaning sinks in residence hall facilities for students to clean their water bottles. We also suggest that prompts be posted to encourage water bottle use and cleaning at both new and existing residence hall sinks.
- Planet Blue should post prompts above existing drinking fountains in campus buildings. This would remind students, faculty, and staff to fill up their water bottles while emphasizing the quality and safety of Ann Arbor's tap water.
- We suggest that water bottle education be incorporated into freshmen and international student orientations. This would include requiring tour guides to carry Michigan reusable water bottles and making the water bottle refill station in Angell Hall a destination during campus tours. The quality and safety of Ann Arbor's tap water should be emphasized to eliminate misconceptions and encourage sustainable water bottle practices. We also advise that students be provided with free reusable water bottles at these orientations.
- We encourage U of M departments and campus groups (living/learning communities, theme semesters, Planet Blue, etc.) to distribute free water bottles that are easy to use and clean. We believe that further research should be done to find the most "student friendly" water bottle.

Introduction

It is assumed that "environmental realities will soon force us to change our resource-costly behaviors". These changes must include modifications in both the quantity and ways in which we use water on a daily basis¹. The privatization of water resources and selling of bottled water has raised serious concerns in Western cultures about the utilization of and waste linked to the use of disposal water containers. In 2009, 600,000 single-use water bottles were purchased on the University of Michigan campus². To promote a more sustainable campus this number must be significantly reduced by encouraging students to use reusable water bottles. The goal of our project was to understand student water bottle usage and to determine the most effective methods to motivate students to use reusable water bottles instead of purchasing bottled water.

Amy Harris and Manja Holland, co-chairs of the LSA Winter 2011 Water Theme Semester, sponsored our project. The Water Theme Semester consisted of more than 75 courses and 100 lectures, symposia, conferences, exhibitions, films, performances, panels and workshops open to students, faculty, staff, and the public about water related topics and issues. At many of these events free reusable water bottles with the Water Semester logo on them were handed out with messages inside. These messages for the "Message in a Bottle" campaign included 10 water facts and 10 water actions to improve people's water literacy. Since our project focused on bottled water usage we created a new "Is Your Bottle Green?" message that included five facts about the negative impacts of bottled water and one action fact to be used in our project (See Appendix).

During this semester, there have also been major efforts by student groups to reduce bottled water consumption on campus. The student organization, Environmental Issues Commission, along with Lauren Sopher, a member of the Water Semester Student Steering Committee, created a petition to ban the sale of bottled water on the U of M campus. They then created an educational presentation on bottled water and presented it to the Michigan Student Assembly in an attempt to influence their votes for the ban. Also, the steering committee raised money throughout the semester to help fund Planet Blue to install more reusable water bottle refill stations on campus. We hope that our recommendations stimulate continued action toward these efforts.

Although it is difficult to effectively change an individual's behavior, there are many different informational, positive motivational, and coercive techniques that have been shown to be effective in motivating behavior change (e.g. prompts, feedback, commitment, social norms, rewards, punishments, etc.). There are also many factors involved that must be taken into consideration when developing a behavior change intervention (e.g. an individual's values, beliefs, attitudes, situational factors, social norms, action skills, competence, etc.)¹. Our project analyzed the impacts of education techniques, social norms, situational factors, water bottle designs, and behavior change settings.

A portion of our project focused on the effects of social norms and educational messages on water bottle usage. Cialdini et al.'s "A Room with a Viewpoint" study found that educational messages and approaches are ineffective⁴. In this study they provided hotel guests with five messages that were meant to convince guests to reuse their towels⁴. One of these messages described the environmental side effects of not reusing your towels and urged guests to reuse their towels to save the environment⁴. They found that the educational message was the least effective message in convincing hotel guests to reuse their towels⁴. Messages that conveyed descriptive norms, such as "a majority of hotel guests participated in the towel recycling program," were far more effective⁴. With Cialdini et al.'s study in mind, we tested education's effectiveness in changing water bottle use behavior⁴.

Goals and Objectives

The main goal of the Water Bottle Behavior Team was to collect a substantial data set for interpretation and analysis in order to determine bottled water and reusable water bottle behavior on the University of Michigan Campus and use this information to better promote the use of tap water over bottled water. Through this study we sought to understand the thought processes associated with choosing bottled water over tap water, determine how social norms influence water bottle behavior, identify the best methods to change water bottle behavior, and create recommendations to student environmental initiatives, campus faculty, and influential campus leaders for decreasing the use of disposable bottled water and increasing the use of reusable water bottles.

Each method used in this study contributed to our overall goal. Through the use of initial surveys targeting students who drink disposable bottled water, we sought to learn the reasons behind this behavior. Subsequent surveys given to these same students after being given information and/or a reusable water bottle helped us determine the factors and methods that change bottled water behavior. Other methods used in our research to achieve these goals included surveying a group of Michigan Community Scholars Program students, interviews with several boys in a fraternity, a focus group with our fellow Sustainability and the Campus classmates, and surveying students from a Biological Anthropology class. Each of these projects contributed important aspects to our objectives and will be discussed in depth in the Methodology section.

The success of the sustainability initiative on the University of Michigan's campus relies on changing everyday behaviors that negatively impact the environment. By studying water bottle behavior and discovering how to decrease the use of disposable bottled water we can potentially aid the university in becoming a more sustainable campus.

Water Bottle & Fact Sheet Study

Methodology

The main structure of the project revolves around the series of surveys that were conducted with University of Michigan students (See Appendix for surveys). The initial survey, the first of three surveys, was given to a sample of 130 students. Within that sample, 46 students received an LSA Water Theme Semester reusable water bottle after taking the survey (See Appendix for picture of bottle). Another 45 students received the reusable water bottle that contained a fact sheet inside on the negative implications of drinking bottled water, and the other 39 students just received the fact sheet. The purpose of the initial survey was to measure the participants' water bottle versus reusable water bottle usage, along with their behavior and attitude towards each.

The surveys were distributed at various locations around campus. The locations included the Michigan Union, Michigan League, Pierpont Commons, Shapiro Undergraduate Library, Blue Apple, and Victors Café in the Hill Dining Center. We targeted students who had just purchased or were drinking bottled water. Although we were able to get 150 students to participate in the study, the final sample ended up being 130 students. During one session of distribution there was miscommunication as to which bottles already contained the fact sheet inside so some students received duplicate information sheets and we removed the surveys from our sample that we felt would create an error in the overall findings. When passing out the surveys the students were that they would receive a few additional e-mails and surveys throughout the semester as a part of the study, and if they completed all three of the surveys we would enter them into a \$50 gift card drawing to Bivouac, Urban Outfitters, Chipotle, or Espresso Royale. A follow-up e-mail was also sent to the participants to remind them of the following two surveys in the study, and to make sure that the email address they had given us was correct.

Close to a month following our initial survey distribution the mid-term survey was sent out via e-mail to all of the participants. The purpose of the mid-term survey, as well as the purpose of the final survey, was to track any behavior changes that may have occurred with the participant's water bottle usage, as well as to determine whether or not receiving a reusable water bottle or information sheet influenced their behavior. The mid-term survey also helped to keep the students engaged in the study and more aware of their water bottle consumption. Three different variations of the mid-term survey were created so that each one was specified towards the material that the participant received. From the 130 participants that were e-mailed, we received 61 responses. The final survey was sent out the following month to the students that completed the initial survey and the mid-term survey. A majority of the questions from the mid-term survey were carried into the final survey so that we could compare individual responses and track any behavior changes that occurred throughout the month. Additional questions were also asked about the students overall attitude towards the study and if it promoted any change in terms of their bottled water usage. We received 42 responses for the final survey, thus, 32% of our original participants took all three surveys in the study. Following the end of this study, two gift card winners were chosen and notified.

Findings

Initial Survey Findings (130 students total):

- 46 students received a reusable water bottle, 39 students received a fact sheet about impacts of bottled water, and 45 students received both a reusable water bottle and a fact sheet.
- When asked, "How often do you drink bottled water?":

Every day	39.2%
A few times a week	25.4%
A few times a month	20.0%
Less than a few times a month	15.4%

• "Why do you drink bottled water? (circle all that apply)"

Convenience	77.7%
Bottled water tastes better than tap water	26.2%
Bottled water is cleaner	10.0%
Other	10.0%

Convenience was the first option/answer listed under the survey question, therefore we believe that this percentage was so high because many students may not have read that they could choose all answers that apply and/or they wanted to complete the survey quickly to continue doing their activities.

- 57% of respondents indicated they always recycle their plastic water bottles after use while 37% some times recycle them.
- Although we targeted students who purchase bottled water, 77% of students surveyed already owned a reusable water bottle, revealing that not having access to a reusable water bottle is not a major barrier for most students. However, 21% of respondents indicated they never use their reusable water bottle and 32% said they only use it a few times a week.
- The most popular reasons why students did not use their initial reusable water bottles included, "I reuse the plastic disposable water bottles," "the tap water tastes odd," "it's easier to grab a bottled water," and "I don't want to carry it around with me." Also many students who live in the residence halls indicated that they "don't want to have to clean it." 52% of students surveyed lived in the residence halls.
- When asked, "How many of your roommates use a reusable water bottle?" 33.1% said a few and 32% said none, while 14% lived alone, indicating that using a reusable water bottle is not a norm among their housemates.
- Of the 130 students surveyed only one student was a Program in the Environment major and 50% of respondents were freshman. This suggests that our respondents were less likely to already have been influenced by information from environmental courses.

Mid-term Survey Findings (61 students total):

• Fact Sheet Group Results: 19 students

o When asked, "How often do you drink bottled water?":

Every day	12.5%
A few times a week	50.0%
A few times a month	18.8%
Never	18.8%

- o 73% of students had been using a reusable water bottle.
- o 79% of students found the information sheet to be somewhat to very effective, and 67% said that it had some influence on them to use the reusable water bottle. Also most students learned something new from the fact sheet.

• Water Bottle Group Results: 19 students

o When asked, "How often do you drink bottled water?":

Every day	26.3%
A few times a week	42.1%
A few times a month	31.6%
Never	0.0%

- o Since receiving the LSA reusable water bottle, 42% of students had been using it while 32% hadn't used it at all (68% use it at least a few times a month).
- o They all enjoyed receiving the reusable water bottle and most of them needed one.

• Water Bottle and Fact Sheet Group Results: 23 students

o When asked, "How often do you drink bottled water?":

Every day	30.4%
A few times a week	8.7%
A few times a month	52.2%
Never	8.7%

- o Since receiving the LSA reusable water bottle, 35% of students had been using it everyday, while 26% had never used it (74% have used it at least a few times a month).
- o Many students had problems with the overall design and efficiency of the bottle we gave them (e.g. the top flipped open and it spilled easily, it leaked, it broke, it was a hassle to clean).
- o 57% of students found the fact sheet interesting somewhat to very interesting, and 39% indicated that it had some influence on them to use the reusable water bottle. Most students learned something new from the information sheet.
- o Overall, a majority of the students enjoyed receiving both items because they needed a reusable water bottle.

Final Survey Findings (42 students total):

• Fact Sheet Group Results: 11 students

o When asked, "How often do you drink bottled water?":

Every day	27.3%
A few times a week	27.3%
A few times a month	36.4%
Never	9.1%

- o 64% of the students had been using a reusable water bottle.
- o Those who used a reusable water bottle used it because it saves them money, it is convenient, tap water is cleaner and tastes better.
- o Those who did not use a reusable water bottle chose not to because they think bottled water is cleaner, bottled water tastes better and is more convenient, and they do not want to spend their money on a reusable water bottle.
- o 55% of students believed that the study made them more aware of their bottled water drinking habits (Figure 1).
- o 36% of students at least agreed they now purchase less bottled water than before participating in our study (Figure 1).

• Water Bottle Group Results: 15 students

o When asked, "How often do you drink bottled water?":

Every day	6.7%
A few times a week	66.7%
A few times a month	13.3%
Never	13.3%

- o Since completing the mid-term survey, 53% of students had been using their LSA reusable water bottle a few times a month.
- o Those who used the reusable water bottle used it because it saves them money, it is convenient, and they like the design of it.
- o Those who did not use the reusable water bottle chose not to because they think bottled water is cleaner, tastes better, and/or is more convenient. Also many students either used a different water bottle or they forgot to use the LSA Water Semester bottle.
- o 73% of students believed that the study made them more aware of their bottled water drinking habits (Figure 2).
- o 67% of students surveyed at least agree that they now purchase less bottled water than before participating in our study (Figure 2).

• Water Bottle and Fact Sheet Group Results: 16 students

o When asked, "How often do you drink bottled water?":

Every day	12.5%
A few times a week	50.0%
A few times a month	18.8%
Never	18.8%

- o Since completing the mid-term survey, 31% of students had been using the LSA reusable water bottle a few times a week, yet 44% had never used it (56% have used it at least a few times a month).
- o Those who used the reusable water bottle used it because it saves them money and it is convenient.
- o 69% of students believed that the study made them more aware of their bottled water drinking habits (Figure 3).
- o 50% at least agreed they now purchase less bottled water than before participating in our study (Figure 3).

Individual Comparative Findings:

- The number of respondents in our sample size was not large enough to draw significant conclusions. Because of the small sample size, we do not believe that the responses we received were representa tive of the student population. Also we believe that our semester long study was not enough time to test durable behavior change (i.e. maintaining the behavior overtime without repeated intervention).
- There were only two students out of 11 who received only a fact sheet who reduced their bottled water consumption.
- Nine students out of 15 who received only a reusable water bottle reduced their bottled water con sumption. Thus, we conclude that more students will adopt the behavior of using a reusable water bottle if they are given a free water bottle and not an information sheet alone.

- Seven students out of 16 who received both a water bottle and fact sheet reduced their bottled water consumption over the semester.
- Figures 4 & 5 show that the number of students who drank bottled water every day decreased from 38.1% in the initial survey to 14.3% in the final survey. To accurately make this comparison only the 42 individuals' data that completed the final survey were used (See Appendix).

Conclusions:

Based on our findings, the reusable water bottle recipient group was the most effective in promoting sustainable water bottle practices. The fact sheet was not as influential as receiving a free water bottle. Although students found the fact sheets to be somewhat effective and informative they did not have as much of a long-term effect on students' behavior. However, if this information was given in another media form it could be more effective in motivating behavior change. The major reasons for students not using their reusable water bottles involved the design and functionality of the bottles. Also a majority of students who either received a water bottle or both a water bottle and fact sheet agreed that they now purchase less bottled water than before participating in our study. A majority of students in the fact sheet group did not agree that they purchase less bottled water than before participating in our study. This again indicates that the fact sheet alone was not very effective.

Class Presentation Study

Methodology

In an attempt to further understand water bottle behavior among a wider variety of students, we surveyed forty-nine students in a biological anthropology class at the University of Michigan titled "Nutrition and Evolution." We distributed initial surveys to this class on March 22, 2011. This survey asked questions concerning water bottle behavior in individuals. After the class completed this survey, we presented our six key facts using a PowerPoint presentation. These six facts had been used previously on a handout we created and were chosen as the most informative and relevant to students. About 2 weeks later, on April 7, 2011, we emailed the individuals who had participated in the initial survey and presentation to participate in a post-survey.

Findings

Of the 49 students surveyed initially, 25 filled out the post-survey. Our results seem to indicate that these students were influenced by the presentation they received in class.

- 47.8% found the information to be somewhat interesting and the visual presentation to be somewhat effective. The majority of students believed that they were influenced by this presentation. This seems to show that a visual presentation can be an effective method of education.
- In the initial survey, 20.4% of students responded that they drink bottled water everyday. In the post-survey, 8% of students said they drink bottled water everyday. This indicates that after receiv ing the visual presentation, there was a decrease in the amount of bottled water consumed. When asked about recycling their empty bottles of water, 60.4% responded that they always recycle their bottles. However, when offered the option of "I do not purchase bottled water," only 44% responded that they always recycle bottled water, with 24% responding that they do not purchase bottled water. We believe adding this option in the post-survey reduced the amount of students who said that they always recycle their bottles.
- In the initial survey, 83.7% of students responded that they own a reusable water bottle, and in the post-survey there was an increase to 92%. Of the 83.7% of students in the initial survey who said that they own a reusable water bottle, 51.2% responded that they use it every day. Of the 92% of the students who said they own a reusable water bottle in the post-survey, 60% responded that they use it every day. Additionally, there was a decrease in the amount of students who responded that they never use their reusable water bottle, going from 18.6% in the initial survey to 4% in the post-survey.

Because we presented in a classroom setting, we asked how many reusable water bottle owners had their water bottle with them in class. Only 1/3 of the class responded that they had their reusable water bottle with them. We then asked why it was that students did not have their reusable water bottles with them. The most prevalent response was that they had forgotten their water bottle followed closely by the inconvenience of carrying it.

In this biological anthropology class, 21 out of 49 students stated that they had a anthropology related concentration or minor. As anthropology is the study of humankind, we believe that these students are more inclined to care about the preservation of the environment due to their concern for human welfare. With this in mind, we believe that the results of these surveys may not be representative of the entire student population.

In the post-survey, 56.5% of students said that environmental reasons were the biggest factor in choosing to use reusable water bottles. There were very mixed responses on whether people believed that tap water was cleaner than bottled water, indicating that education concerning the health and safety of tap water is lacking. A strong majority of students responded that several to a majority of their friends use reusable water bottles, however almost all students said that their friends use of reusable water bottles had no effect on them. Saving money and convenience seemed to be the strongest reasons for students to use reusable water bottles. Finally, we asked whether these students learned anything new from this presentation and 34.8% responded positively.

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Michigan Community Scholars Program Study

Methodology

We surveyed students in the Michigan Community Scholars Program (MCSP) to further analyze water bottle behavior on the U of M campus. MCSP is a living and learning program that is located in East Quad and dedicated to community service. In the beginning of the year, all MCSP students were given a MCSP reusable water bottle. We surveyed them to find out how many students still use the reusable water bottle they were given, and the reasons why they still use or no longer use the reusable water bottle. With this group, we were interested in evaluating the influence of social norms in water bottle behavior.

Findings

There were 37 students from MCSP that responded to the survey.

- Just over half of the students (56.8%) reported that they still use their reusable water bottles. Out of the 23 students who still use their reusable water bottle, 47.8% indicated their main reason for using the reusable water bottles was because it is good for the environment (Figure 6). However, using the reusable water bottles simply because their friends use reusable water bottles was considered to be the least important reason. Only 4.3% of the 23 students put this as their main reason for continuing to use their reusable water bottles.
- The main reason why students did not continue to use their reusable water bottles was because the bottles were developing mold. Out of the 14 students who no longer use their bottles, 44.4% of the students responded "Other" and explained that the bottles were collecting colonies of mold and the shape of the bottles made it very difficult to clean them (Figure 7). According to the responses, no longer using the reusable water bottles because their friends did not use reusable water bottles was considered to be the least important reason. In fact, none of the students put this as their main reason for no longer using their reusable water bottles.

These findings point to several key conclusions. For one, social norms seem to have no influence on whether or not students continued to use their reusable water bottles. Second, results suggested that the main reason why students continued to use their bottles is because it is good for the environment. Finally, it appears as though most students did not continue to use the reusable water bottle because of problems with the water bottle itself.

This survey may have contained some inherent biases. For example, due to the response bias, some students may not have been aware or willing to admit that their friends influence their behavior. They may have felt that admitting this would make them seem less like individuals and more like followers. Along the same lines, they may have answered that their main reason for continuing to use the reusable water bottles is because it is good for the environment so that they seem more selfless and socially aware. Despite anonymity, students may still have answered in ways that they felt were expected of them or made them feel better about themselves.

Fraternity Interview Study

Methodology

Four members of Sigma Chi fraternity were given free reusable water bottles with education sheets. After two months, these students took part in a focus group about their experiences with their new bottles. This group was included in our overall study because we wanted to track people's progress with the reusable water bottles over time. Unlike a survey, this focus study allowed us to ask in depth questions about the advantages and disadvantages of using a reusable water bottle as compared to bottled water, and helped us gain insight into the behavioral mindsets people have when choosing one over the other. These brothers were all picked from the same fraternity, Sigma Chi, so that we could see if social norms had any influence on the usage of the reusable bottles. Each of the brothers were given a reusable water bottle with an education sheet inside, and challenged to use them as much as possible over the semester. We told them that they would eventually be interviewed about their experiences but did not reveal which questions would be asked.

Findings

After two months of owning reusable water bottles, three members of Sigma Chi fraternity have changed their water bottle use. Prior to owning a reusable water bottle, all three students had used plastic disposable bottles as their primary source of water. They explained that it was convenient for them to use these plastic bottles because their fraternity's dining service brings boxes of them to their daily meals.

However, after receiving a free water bottle, all three students are consistently using reusable water bottles as their main source of water. They gave a number of reasons for their change in behavior:

- Convenience: Owning a reusable water bottle gives you access to fresh and cold water at all times. They said that using plastic water bottles was inconvenient compared to their reusable bottles because their water got warm as the day went on and they had to buy a new bottle if they wanted fresh water.
- Cost: All three of them said that owning a reusable water bottle has saved them a lot of money.
- Environmental factor: All three students agreed helping the environment motivated them to change their behavior.
- Price: All three students said that receiving a free water bottle was the biggest factor in changing their behavior. They said that they chose not to use reusable water bottles prior to receiving their free one because they did not want to spend over ten dollars on a reusable bottle.
- Social norms: One student, who happens to be an environment major, said that he felt pressure to use a reusable water bottle because almost everyone in PitE uses one. He said that he jumped on the chance to use this free bottle because of this pressure he has been feeling in his classes.

The students also said that the education sheets played a very small role in changing their behavior. One student did not even remember receiving one and the other two could hardly recall the facts on the sheet. All three said that they were aware of the side effects of plastic water bottles prior to this experiment.

Focus Group Study

Methodology & Findings

In order to have a wide variety of information concerning water bottle behavior, we conducted a focus group with five students in the Environment 391 class. We decided that a focus group would be most beneficial because we wanted to encourage a discussion among environmentally conscious students. What we discovered was that all these students use reusable water bottles and that for the most part, they use them because they have learned that they are better for the environment. Because all these students use reusable water bottles, we wanted to learn what other factors influence their behavior and how they believe other people can be influenced concerning water bottle usage. In addition to environmental concerns, convenience seemed to be a strong reason for using a reusable water bottle. When asked if they had background experiences that influenced them to use a reusable water bottle, most students agreed that environmental education during high school was influential. In addition to education, having spent a lot of time outside growing up and developing an appreciation for nature was also a common reason. We also asked if their parents used reusable water bottles and were told that most of these students had encouraged their parents to do so.

One student explained that her parents are from India and have different views of tap water than we do in the United States. Though she has tried to express the importance of using reusable water bottles to her parents, their attitude toward tap water has been difficult for her to alter. The group agreed that people from other countries and certain cultures often have predetermined views of tap water that are difficult to change, even with education on the topic. At the University of Michigan, we have many international students. The group agreed that international students are often more concerned about the quality of tap water based on their views of tap water from their home country. This group suggested that focusing attention on educating and changing the water bottle behavior of international students could be especially beneficial.

We asked why they think people still buy bottled water, and the general consensus was that people think bottled water is cleaner, more convenient, and many people forget to bring their reusable water bottles everywhere they go. This group of students thinks that making refill stations for reusable water bottles more prevalent and accessible on campus would encourage more students to use reusable water bottles. They also agree that students need to be better educated on the impact that using disposable water bottles has on the environment.

These students believe that as students in environmental classes, they are influenced by fellow environmental student's behavior and would not want to have disposable water bottles in their environmental classes. However, they do not feel this way in their non-environmental classes and notice that more students in these classes use disposable water bottles.

Sunthesis of Results

While analyzing all of our results for each project we discovered cross-study trends. We found that it is inconvenient for students to clean their reusable water bottles particularly in the residence halls. Our results also indicated that there is a lack of education regarding the quality and safety of Ann Arbor's tap water among the University's students. Peer influence was found to effect student water bottle behavior. In addition, we discovered that providing free reusable water bottles to students and educating students through visual means can effectively change behavior. These overall findings guided us in creating recommendations to increase student use of reusable water bottles.

Recommendations

After compiling all the results from the multiple studies we conducted, we have determined that there are several actions that various U of M departments could do in order to align with the University of Michigan's commitment to sustainability.

1. Install cleaning sinks for water bottles in residence halls.

We believe that installing cleaning sinks for water bottles in the dormitories would make using a reusable water bottle more convenient for students. As many of our respondents live in the dorms, we received many comments about the difficulties of cleaning out their water bottles. We suggest that University Housing install more sinks for the use of water bottle cleaning. We suggest labeling these sinks as designated water bottle cleaning stations in order to promote their use. We also recommend posting these prompts at existing residence hall cleaning sinks.

2. Provide prompts on existing drinking fountains.

We also suggest that Planet Blue create prompts to be put above drinking fountains, reminding students to fill their reusable water bottles with Ann Arbor's safe tap water. We found that visual methods of education were very effective and believe that prompts with simple images reminding students to "Turn on the Tap" would be an easy way to promote sustainability on campus. This would be an inexpensive, educational campaign to encourage the use of tap water, emphasizing the quality of Ann Arbor's tap water to correct any misconceptions that the tap water is not safe.

3. Incorporate water bottle education into freshmen and international student orientations.

While most students involved in environmental classes and activities seem well informed on sustainable water bottle practices, we learned that many other students may not be exposed to this information. We think that it is necessary to include water bottle education in U of M orientations. To do this, we suggest making the water bottle refill stations a stopping point during the campus tour. At this time we think orientation leaders should discuss how using reusable water bottles is a part of the University's sustainability initiative. We also recommend that orientation leaders and U of M tour guides be provided with reusable water bottles with the University of Michigan's logo and be required to carry it around during orientation. This would help establish reusable water bottle use as a norm on campus, motivating student water bottle usage.

In addition to the freshman student orientation, we also recommend that reusable water bottle use and tap water quality be especially emphasized at the international student orientations. We learned that often because of the water quality in other countries, international students are more hesitant to drink tap water at U of M. We suggest that the quality and safety of Ann Arbor's tap water be emphasized at the international student orientation.

We also recommend that all students at these orientations be given a free reusable water bottle with the U of M logo on it. We believe that this would further promote the use of reusable water bottles on campus because we found that students are more likely to use them when they are provided for free.

4. Encourage U of M departments and campus groups to distribute free water bottles that are easy to use and clean.

We found that the distribution of water bottles is effective in encouraging reusable water bottle use.

Therefore, we suggest that U of M departments and campus groups distribute free water bottles to members and at events, as a way of advertising for their group. We also received many comments about the function and design of the LSA Water Theme Semester reusable water bottles. We learned how important it is that these bottles be durable and easy to clean in order to motivate individuals to use them. We believe that it would be beneficial to do further studies on what types of water bottles are most appealing and useful to students, encouraging the distribution of these specific water bottles.

Conclusion and Lessons Learned

Throughout our various research projects this semester, we have discovered that there are many factors to consider in understanding water bottle behavior. We were able to address many of these aspects through our different methods of study. Our studies have shown that there are still areas for further research such as which types of reusable water bottles are most appealing to students and whether certain water bottle designs more effectively cater to different social groups. Increasing awareness and understanding of water conservation among students is necessary to maintain the University's commitment to sustainability. We hope that our research and recommendations will help promote more sustainable behavior on the University of Michigan campus.

Appendix

Endnotes

- 1. De Young, Raymond. "Changing Behavior and Making it Stick: The Conceptualization and Management of Conservation Behavior." Environment and Behavior 25.4 July (1993): 485-505.
- 2. Earle, Sylvia A. The World is Blue: How our fate and the ocean's are one. Washington, D.C.: National Geo graphic Society, 2009.
- 3. "Planet Blue Newsletter- November Issue." Planet Blue- University of Michigan. Planet Blue, 8 Nov. 2010. Web. 20 Apr. 2011. http://www.planetblue.umich.edu/news.php?nid=47.
- 4. Cialdini, Robert B., Noah J. Goldstein, and Vladas Griskevicius. "A Room with a Viewpoint: Using Social Norms to Motivate Environmental Conservation in Hotels." Journal of Consumer Research 35 Oct. (2008): 472-82.

Water Bottle & Fact Sheet Study

Surveys:

Initial Survey: (Distributed in person at various UM locations to students who were carrying or drinking bottled water)

Please fill out the following survey for a study on water bottle usage. By participating, you are agreeing to let us contact you via email three additional times during the semester, including a follow up email in the next couple of days, a brief midterm survey, and a brief final survey. If you complete all three surveys you will be entered to win a \$50 gift card to Bivouac, Urban Outfitters, Chipotle, or Espresso Royale, your choice!

- 1. How often do you drink bottled water?
 - a. Every day
 - b. A few times a week
 - c. A few times a month
 - d. Less than a few times a month
- 2. Why do you drink bottled water? (Circle all that apply)
 - a. Convenience
 - b. Bottled water tastes better than tap water
 - c. Bottled water is cleaner
 - d.Other:
- 3. When you purchase bottled water it is:
 - a. Only individual bottles
 - b. Only package/cases
 - c. Both A and B

4. Do you recycle your plastic water bottles after use?
a. Always
b. Sometimes
c. Never
5. Do you own a reusable water bottle?
a. Yes
b. No
If yes, how often do you use it?
a. Every day
b. A few times a week
c. A few times a month
d. Never
If no, why not? Please explain:
6. How many of your roommates use a reusable water bottle?
a. I live alone
b. None
c. A few
d. Several
e. A majority
7. What is your unique name? (We will only be sending you three brief emails.)
8. What is your major, double major, and/or minor?
8. What is your major, double major, and/or minor?
8. What is your major, double major, and/or minor?9. Academic year:
8. What is your major, double major, and/or minor?9. Academic year: a. Freshman
 8. What is your major, double major, and/or minor? 9. Academic year: a. Freshman b. Sophomore c. Junior d. Senior
 8. What is your major, double major, and/or minor? 9. Academic year: a. Freshman b. Sophomore c. Junior d. Senior e. Master's
 8. What is your major, double major, and/or minor? 9. Academic year: a. Freshman b. Sophomore c. Junior d. Senior
 8. What is your major, double major, and/or minor? 9. Academic year: a. Freshman b. Sophomore c. Junior d. Senior e. Master's
8. What is your major, double major, and/or minor? 9. Academic year: a. Freshman b. Sophomore c. Junior d. Senior e. Master's f. Ph.D.
 8. What is your major, double major, and/or minor? 9. Academic year: a. Freshman b. Sophomore c. Junior d. Senior e. Master's f. Ph.D. 10. Gender:
8. What is your major, double major, and/or minor? 9. Academic year: a. Freshman b. Sophomore c. Junior d. Senior e. Master's f. Ph.D.
8. What is your major, double major, and/or minor? 9. Academic year: a. Freshman b. Sophomore c. Junior d. Senior e. Master's f. Ph.D. 10. Gender: a. Man b. Woman
8. What is your major, double major, and/or minor? 9. Academic year: a. Freshman b. Sophomore c. Junior d. Senior e. Master's f. Ph.D. 10. Gender: a. Man b. Woman 11. Do you live in a:
8. What is your major, double major, and/or minor? 9. Academic year: a. Freshman b. Sophomore c. Junior d. Senior e. Master's f. Ph.D. 10. Gender: a. Man b. Woman 11. Do you live in a: a. Apartment
8. What is your major, double major, and/or minor? 9. Academic year: a. Freshman b. Sophomore c. Junior d. Senior e. Master's f. Ph.D. 10. Gender: a. Man b. Woman 11. Do you live in a: a. Apartment b. House c. Dormitory d. Sorority/fraternity
8. What is your major, double major, and/or minor? 9. Academic year: a. Freshman b. Sophomore c. Junior d. Senior e. Master's f. Ph.D. 10. Gender: a. Man b. Woman 11. Do you live in a: a. Apartment b. House c. Dormitory d. Sorority/fraternity e. Cooperative
8. What is your major, double major, and/or minor? 9. Academic year: a. Freshman b. Sophomore c. Junior d. Senior e. Master's f. Ph.D. 10. Gender: a. Man b. Woman 11. Do you live in a: a. Apartment b. House c. Dormitory d. Sorority/fraternity

Mid-Surveys: (Distributed through email and created on surveymonkey.com. Each group received a different survey depending on what materials they were given with the initial survey.)

Mid-term Survey Fact Sheet Group

4	XX 71 .					7
Ι.	What	1S	your	uniq	uename	!

- 2. How often do you drink bottled water?
 - a. Every day
 - b. A few times a week
 - c. A few times a month
 - e. Never
- 3. Do you recycle your plastic water bottles after use?
 - a. Always
 - b. Sometimes
 - c. Never
 - d. I do not purchase bottled water
- 4. Do you use a reusable water bottle?
 - a. Yes
 - b. No
- 5. If you answered YES, to what degree do the items below match your reasons for using a reusable water bottle:

(X=No Opinion 1=Not at all 2= Not Very Well 3=Somewhat 4= Pretty Well 5= Extremely Well)

```
3 4 5
X
  1
                      Environmental purposes
X 1
      2
        3 4 5
                      Tap water is cleaner
X 1 2
        3 4 5
                      Tap water tastes better
X 1 2
                      My friends use a reusable water bottle
        3 4 5
X 1 2 3 4 5
                      It saves me money
X 1 2 3 4 5
                      It is convenient
      2
        3 4 5
                      I like the design of it
X 1
X 1 2 3 4 5
                      Other: Please explain_____
```

6. If you answered NO, to what degree do the items below match your reasons for NOT using a reusable water bottle:

(X=No Opinion 1=Not at all 2= Not Very Well 3=Somewhat 4= Pretty Well 5= Extremely Well)

X	1	2	3	4	5	My friends DO NOT use a reusable water bottle
X	1	2	3	4	5	I use a different reusable water bottle
X	1	2	3	4	5	Bottled water is more convenient
X	1	2	3	4	5	Bottled water is cleaner
X	1	2	3	4	5	Bottled water tastes better
X	1	2	3	4	5	I do NOT like the design of it
X	1	2	3	4	5	Other: Please explain

-	-	_			tle information sheet when you took the first survey. To what degree do the out receiving it?
(X=No Opini	on 1=	=No	t at a	all 2= No	ot Very Well 3=Somewhat 4= Pretty Well 5= Extremely Well)
X 1	2	3	4	5	I found the Information very interesting
X 1	2	3	4	5	I found the pictures to be effective
X 1	2 2	3	4	5	It influenced me to use the reusable water bottle
X 1	2	3	4	5	I did not learn anything new
X 1	2	3	4	5	I disagree with the information
X 1	2	3	4	5	I did not read it
X 1	2	3	4	5	I do not remember receiving it
X 1		3		5	Other: Please explain
Mid-Term S	<u>urvey</u>	: W	<u>ater</u>	Bottle G	<u>Group</u>
1. What is yo	ur uni	que	nam	e?	
2. How often a. Eve b. A fe c. A fe e. Nev	ery day ew tin ew tin	y nes a	a we	eek	vater?
a. Alv b. Sor c. Nev	vays metim ver	es		stic water	bottles after use?
•	ng the cryday ew tin	reu nes a	sabl a we	e water b eek	vey you were given a LSA Water Theme Semester reusable water bottle. ottle, how often have you used it?
5. If you USF sons for using		LSA	Wat	ter Theme	e Semester water bottle, to what degree do the items below match your rea-
(X=No Opini	on 1=	=No	t at a	all 2= No	ot Very Well 3=Somewhat 4= Pretty Well 5= Extremely Well)
X 1	2	3	4	5	Environmental purposes

X	1	2	3	4	5	Tap water is cleaner
X	1	2	3	4	5	Tap water tastes better
X	1	2	3	4	5	My friends use a reusable water bottle
X	1	2	3	4	5	It saves me money
X	1	2	3	4	5	It is convenient
X	1	2	3	4	5	I like the design of it
X	1	2	3	4	5	Other: Please explain

6. If you DO NOT USE the LSA Water Theme Semester water bottle, to what degree do the items below match your reasons for NOT using it:

(X=No Opinion 1=Not at all 2= Not Very Well 3=Somewhat 4= Pretty Well 5= Extremely Well)

3 4 X 1 2 5 My friends DO NOT use a reusable water bottle 2 3 4 5 X 1 I use a different reusable water bottle 2 X 1 3 4 5 Bottled water is more convenient X 1 2 3 4 5 Bottled water is cleaner X 1 2 3 4 5 Bottled water tastes better X 1 2 3 4 5 I do NOT like the design of it 2 3 4 5 X 1 Other: Please explain_____

7. To what degree do the items below match your attitude about receiving the LSA Water Theme Semester reusable water bottle:

(X=No Opinion 1=Not at all 2= Not Very Well 3=Somewhat 4= Pretty Well 5= Extremely Well)

X 1 2 3 4 5 I enjoyed receiving them
X 1 2 3 4 5 I did not need a reusable water bottle

X 1 2 3 4 5 I felt pressured to use the reusable water bottle

X 1 2 3 4 5 I felt annoyed

X 1 2 3 4 5 Other: Please explain _____

Mid-term Survey: Water Bottle & Fact Sheet Group

- 1. What is your uniquename?
- 2. How often do you drink bottled water?
 - a. Every day
 - b. A few times a week
 - c. A few times a month
 - e. Never
- 3. Do you recycle your plastic water bottles after use?
 - a. Always
 - b. Sometimes
 - c. Never
 - d. I do not purchase bottled water
- 4. When you completed the first survey you were given a LSA Water Theme Semester reusable water bottle. Since receiving the reusable water bottle, how often have you used it?
 - a. Everyday
 - b. A few times a week
 - c. A few times a month
 - d. Never

5. If you USE the LSA Water Theme Semester water bottle, to what degree do the items below match your reasons for using it: (X=No Opinion 1=Not at all 2= Not Very Well 3=Somewhat 4= Pretty Well 5= Extremely Well) 3 4 X 1 5 Environmental purposes 2 3 4 5 X 1 Tap water is cleaner 2 X 1 3 4 5 Tap water tastes better 3 4 5 My friends use a reusable water bottle X 1 X 1 2 3 4 5 It saves me money X 1 2 3 4 5 It is convenient 2 3 4 5 X 1 I like the design of it X 1 2 3 4 5 Other: Please explain 6. If you DO NOT USE the LSA Water Theme Semester water bottle, to what degree do the items below match your reasons for NOT using it: (X=No Opinion 1=Not at all 2= Not Very Well 3=Somewhat 4= Pretty Well 5= Extremely Well) 4 5 X 1 3 My friends DO NOT use a reusable water bottle 3 4 5 X 1 I use a different reusable water bottle X 1 2 3 4 5 Bottled water is more convenient X 1 2 3 4 5 Bottled water is cleaner X 1 2 3 4 5 Bottled water tastes better X 1 2 3 4 5 I do NOT like the design of it X 1 3 4 5 Other: Please explain_____ 7. You were also given a green water bottle information sheet when you took the first survey. To what degree do the items below match your attitude about receiving it? (X=No Opinion 1=Not at all 2= Not Very Well 3=Somewhat 4= Pretty Well 5= Extremely Well) X 1 3 4 5 I found the Information very interesting 2 X 1 3 4 5 I found the pictures to be effective 2 X 1 3 4 5 It influenced me to use the reusable water bottle X 1 2 3 4 5 I did not learn anything new X 1 2 3 4 5 I disagree with the information X 1 2 3 4 5 I did not read it X 1 2 3 4 5 I do not remember receiving it 3 4 5 X 1 Other: Please explain_____ 8. To what degree do the items below match your attitude about receiving the LSA Water Theme Semester reusable water bottle and information sheet: (X=No Opinion 1=Not at all 2= Not Very Well 3=Somewhat 4= Pretty Well 5= Extremely Well) 3 4 5 I enjoyed receiving them X 1 X 1 2 3 4 5 I did not need a reusable water bottle X 1 2 3 4 5 I felt pressured to use the reusable water bottle X 1 2 3 4 5 I felt annoyed X 1 2 3 4 5 Other: Please explain _____

Final Surveys: (Each group received a different survey below depending on what materials they were given with the initial survey.)

Final Survey- Fact Sheet Group

4	X X 71 .				
Ι.	What	1S	your	uniq	uename?

- 2. How often do you drink bottled water?
 - a. Every day
 - b. A few times a week
 - c. A few times a month
 - e. Never
- 3. Do you recycle your plastic water bottles after use?
 - a. Always
 - b. Sometimes
 - c. Never
 - d. I do not purchase bottled water
- 4. Do you use a reusable water bottle?
 - a. Yes
 - b. No
- 5. If you answered YES, to what degree do the items below match your reasons for using a reusable water bottle:

(X=No Opinion 1=Not at all 2= Not Very Well 3=Somewhat 4= Pretty Well 5= Extremely Well)

```
3 4
X
               5
  1
                      Environmental purposes
      2
X
  1
         3 4 5
                      Tap water is cleaner
X 1 2
         3 4 5
                      Tap water tastes better
      2
         3 4 5
                      My friends use a reusable water bottle
X 1
X 1 2 3 4 5
                      It saves me money
X 1 2 3 4 5
                      It is convenient
      2
X 1
         3 4 5
                      I like the design of it
      2.
X 1
        3 4 5
                      Other: Please explain_____
```

6. If you answered NO, to what degree do the items below match your reasons for NOT using a reusable water bottle:

(X=No Opinion 1=Not at all 2= Not Very Well 3=Somewhat 4= Pretty Well 5= Extremely Well)

X	1	2	3	4	5	My friends DO NOT use a reusable water bottle
X	1	2	3	4	5	I use a different reusable water bottle
X	1	2	3	4	5	Bottled water is more convenient
X	1	2	3	4	5	Bottled water is cleaner
X	1	2	3	4	5	Bottled water tastes better
X	1	2	3	4	5	I do NOT like the design of it
X	1	2	3	4	5	Other: Please explain

7. How strongly do you agree with the following statements?(X=No Opinion 1=Strongly Disagree 2= Disagree 3=Neutral 4= Agree 5= Strongly Agree)

X 1 2 3 4 5 This study has made me more aware of my bottled water drinking habits I purchase less bottled water than before I X 1 2 3 4 5 started participating in this study This study influenced me to learn more X 1 2 3 4 5 about the environmental impacts of bottled water X 1 2 3 4 5 I have attended at least one LSA Water Theme Semester event

Final Survey: Water Bottle Group

- 1. What is your uniquename?
- 2. How often do you drink bottled water?
 - a. Every day
 - b. A few times a week
 - c. A few times a month
 - e. Never
- 3. Do you recycle your plastic water bottles after use?
 - a. Always
 - b. Sometimes
 - c. Never
 - d. I do not purchase bottled water
- 4. Since you completed the second survey online how often have you used the LSA Water Theme Semester water bottle?
 - a. Everyday
 - b. A few times a week
 - c. A few times a month
 - d. Never
- 5. If you USE the LSA Water Theme Semester water bottle, to what degree do the items below match your reasons for using it:

(X=No Opinion 1=Not at all 2= Not Very Well 3=Somewhat 4= Pretty Well 5= Extremely Well)

X	1	2	3	4	5	Environmental purposes
X	1	2	3	4	5	Tap water is cleaner
X	1	2	3	4	5	Tap water tastes better
X	1	2	3	4	5	My friends use a reusable water bottle
X	1	2	3	4	5	It saves me money
X	1	2	3	4	5	It is convenient
X	1	2	3	4	5	I like the design of it
X	1	2	3	4	5	Other: Please explain

6. If you DO NOT USE the LSA Water Theme Semester water bottle, to what degree do the items below match your reasons for NOT using it:

(X=No Opinion 1=Not at all 2= Not Very Well 3=Somewhat 4= Pretty Well 5= Extremely Well)

X	1	2	3	4	5	My friends DO NOT use a reusable water bottle
X	1	2	3	4	5	I use a different reusable water bottle
X	1	2	3	4	5	Bottled water is more convenient
X	1	2	3	4	5	Bottled water is cleaner
X	1	2	3	4	5	Bottled water tastes better
X	1	2	3	4	5	I do NOT like the design of it
X	1	2	3	4	5	Other: Please explain

7. How strongly do you agree with the following statements?

(X=No Opinion 1=Strongly Disagree 2= Disagree 3=Neutral 4= Agree 5= Strongly Agree)

X	1	2	3	4	5	This study has made me more aware of my
						bottled water drinking habits
X	1	2	3	4	5	I purchase less bottled water than before I
						started participating in this study
X	1	2	3	4	5	This study influenced me to learn more
						about the environmental impacts of
						bottled water
X	1	2	3	4	5	I have attended at least one LSA Water
						Theme Semester event

Final Survey: Water Bottle & Fact Sheet Group

- 1. What is your uniquename?
- 2. How often do you drink bottled water?
 - a. Every day
 - b. A few times a week
 - c. A few times a month
 - e. Never
- 3. Do you recycle your plastic water bottles after use?
 - a. Always
 - b. Sometimes
 - c. Never
 - d. I do not purchase bottled water
- 4. Since you completed the second survey online how often have you used the LSA Water Theme Semester water bottle?
 - a. Everyday
 - b. A few times a week
 - c. A few times a month
 - d. Never

5. If you USE the LSA Water Theme Semester water bottle, to what degree do the items below match your rea
sons for using it:

(X=No Opinion 1=Not at all 2= Not Very Well 3=Somewhat 4= Pretty Well 5= Extremely Well)

X	1	2	3	4	5	Environmental purposes
X	1	2	3	4	5	Tap water is cleaner
X	1	2	3	4	5	Tap water tastes better
X	1	2	3	4	5	My friends use a reusable water bottle
X	1	2	3	4	5	It saves me money
X	1	2	3	4	5	It is convenient
X	1	2	3	4	5	I like the design of it
X	1	2	3	4	5	Other: Please explain

6. If you DO NOT USE the LSA Water Theme Semester water bottle, to what degree do the items below match your reasons for NOT using it:

(X=No Opinion 1=Not at all 2= Not Very Well 3=Somewhat 4= Pretty Well 5= Extremely Well)

X	1	2	3	4	5	My friends DO NOT use a reusable water bottle
X	1	2	3	4	5	I use a different reusable water bottle
X	1	2	3	4	5	Bottled water is more convenient
X	1	2	3	4	5	Bottled water is cleaner
X	1	2	3	4	5	Bottled water tastes better
X	1	2	3	4	5	I do NOT like the design of it
X	1	2	3	4	5	Other: Please explain

7. How strongly do you agree with the following statements?

(X=No Opinion 1=Strongly Disagree 2= Disagree 3=Neutral 4= Agree 5= Strongly Agree)

X	1	2	3	4	5	This study has made me more aware of my bottled water drinking habits
X	1	2	3	4	5	I purchase less bottled water than before I
X	1	2	3	4	5	started participating in this study This study influenced me to learn more
						about the environmental impacts of bottled water
X	1	2	3	4	5	I have attended at least one LSA Water Theme Semester event

Graphs:

How strongly do you agree with the following statements:

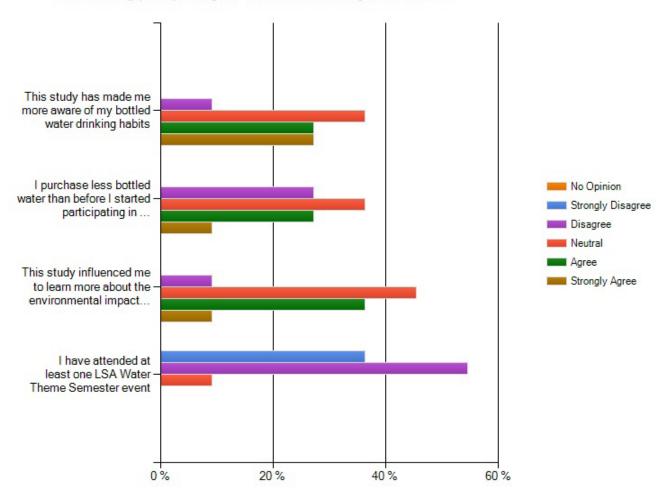


Figure 1: This graph shows the percentages of responses in the final survey of the 11 students who received a fact sheet. They were asked, "How strongly do you agree with the following statements?"

How strongly do you agree with the following statements:

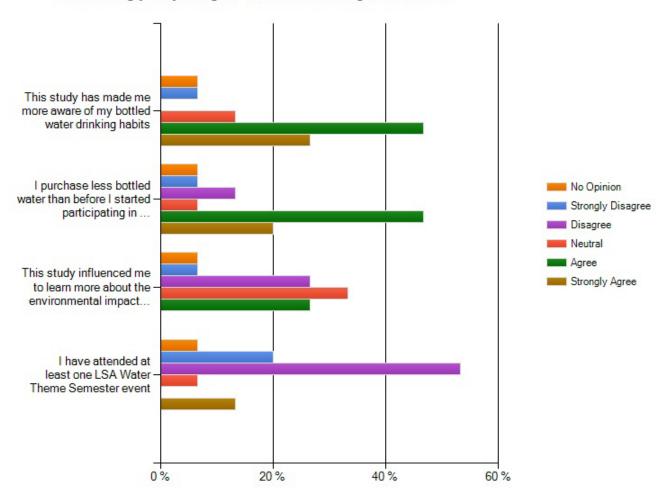


Figure 2: This graph shows the percentages of responses in the final survey of the 15 students who received a reusable water bottle. They were asked, "How strongly do you agree with the following statements?"

How strongly do you agree with the following statements:

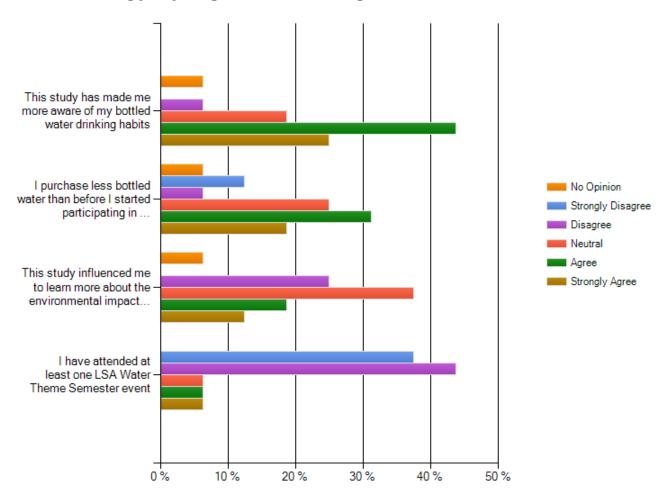


Figure 3: This graph shows the percentages of responses in the final survey of the 16 students who received both a reusable water bottle and a fact sheet. They were asked, "How strongly do you agree with the following statements?"

How often do you drink bottled water?

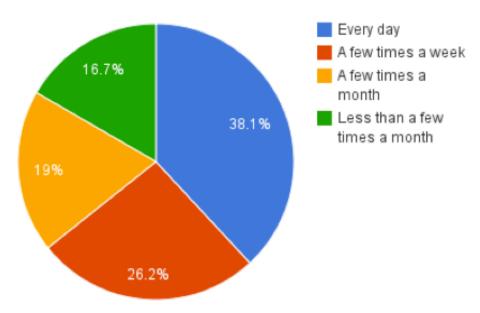


Figure 4: This graph shows the percentages of individuals' responses to the initial survey when asked, "How often do you drink bottled water?" Only the 42 individuals' data that completed the final survey were used.

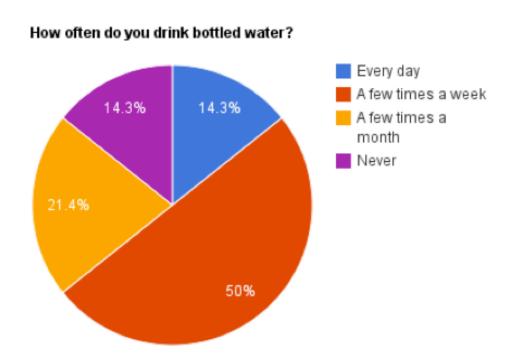


Figure 5: This graph shows the percentages of the 42 individuals' responses to the final survey when asked, "How often do you drink bottled water?" In comparison to their responses in figure 4, the number of students who drank bottled water every day decreased from 38.1% to 14.3%. Again only the 42 individuals' data that completed the final survey were used, in order to accurately compare their initial survey responses to their final survey responses.

(Front)



IS YOUR BOTTLE "GREEN"?

- **1** . **Bottled water is expensive.** Bottled water costs 10,000 times more than tap water.
- 2. Bottled water is not safer than tap water. 40% of all bottled water is taken from tap water. 1/5 of tested bottled water brands contain chemical contaminants at levels above strict state health limits.
- 3. Bottled water wastes water. It takes 3 liters of water to make approximately 1 liter of bottled water.
- 4 Bottled water wastes energy. 17 Million barrels of oil are used in the production of water bottles annually—that's enough to fuel 1 million cars for a year!
- 5. Disposable water bottles are wasteful. A half-billion water bottles are consumed each week in the U.S.—that's enough to circle the globe five times!
- 6. What can you do? In 2009, almost 600,000 singleuse water bottles were purchased on the University of Michigan campus. You can save money, energy, and water, and stay healthy, by drinking tap water and carrying a reusable water bottle!



(Back)



IS **YOUR** BOTTLE "**GREEN**"?

- **1. Bottled water is expensive.** Bottled water costs 10,000 times more than tap water.
- 2. Bottled water is not safer than tap water. 40% of all bottled water is taken from tap water. 1/5 of tested bottled water brands contain chemical contaminants at levels above strict state health limits.
- 3. Bottled water wastes water. It takes 3 liters of water to make approximately 1 liter of bottled water.
- 4. Bottled water wastes energy. 17 Million barrels of oil are used in the production of water bottles annually—that's enough to fuel 1 million cars for a year!
- 5. Disposable water bottles are wasteful. A half-billion water bottles are consumed each week in the U.S.—that's enough to circle the globe five times!
- 6. What can you do? In 2009, almost 600,000 singleuse water bottles were purchased on the University of Michigan campus. You can save money, energy, and water, and stay healthy, by drinking tap water and carrying a reusable water bottle!



For more information: watersemester.com storyofbottledwater.org

LSA Theme Semester Reusable Water Bottle:



Class Presentation Study

Surveys:

Class Presentation Initial Survey:

1. How often do you drink bottled water? a. Every day b. A few times a week c. A few times a month d. Less than a few times a month							
a. Why do you drink bottled water? (circle all that apply) a. Convenience b. Bottled water tastes better than tap water c. Bottled water is cleaner d. Other:							
3. When you purchase bottled water you buy: a. Individual bottles b. Package/cases c. Both A and B							
 4. Do you recycle your plastic water bottles after use? a. Always b. Sometimes c. Never 							
5. Do you own a reusable water bottle? a. Yes b. No							
If yes, how often do you use it? a. Every day b. A few times a week c. A few times a month d. Never							
Do you have your reusable water bottle with you now? a. Yes b. No							
If you don't have your reusable water bottle with you now, why not? a. I don't own one b. I forgot it c. I haven't cleaned it d. It's inconvenient to carry e. Other (please explain)							

6. How n	nany of your friends use a reusable water bottle
a.	None
b.	A few
c.	Several
	A majority
u.	71 majority
7. What i	s your major, double major, and/or minor?
8. Acadei	mic year:
a.	Freshman
b.	Sophomore
	Junior
d.	Senior
	Master's
	Ph.D.
1.	1112.
9. Gende	r:
a.	Male
b.	Female
•	ou live in a:
a.	Apartment
b.	House
c.	Dormitory
d.	Sorority/fraternity
e.	Cooperative
f.	Other:
Class Pro	esentation Post Survey:
	ften do you drink bottled water?
	Every day
	A few times a week
c.	A few times a month
d.	Less than a few times a month
2 Do voi	recycle your plastic water bottles after use?
•	Always
	Sometimes
	Never
c.	Never
3. Do voi	use a reusable water bottle?
-	Yes
	No
•	w often do you use it?
	Every day
	A few times a week
	A few times a month
d.	Never

4. If you answered YES, to what degree do the items below match your reasons for using a reusable water bottle:

(X=No Opinion 1=Not at all 2= Not Very Well 3=Somewhat 4= Pretty Well 5= Extremely Well)

```
4
X
  1
       2
          3
                5
                        Environmental purposes
      2
          3
                5
X
  1
             4
                        Tap water is cleaner
      2
                5
X
  1
          3 4
                        Tap water tastes better
      2
X
          3 4
                5
                        My friends use a reusable water bottle
  1
X 1 2
         3 4 5
                        It saves me money
X 1
      2
         3 4 5
                        It is convenient
      2
               5
X
  1
          3 4
                        I like the design of it
      2
X 1
         3 4 5
                        Other: Please explain_____
```

5. If you answered NO, to what degree do the items below match your reasons for NOT using a reusable water bottle:

(X=No Opinion 1=Not at all 2= Not Very Well 3=Somewhat 4= Pretty Well 5= Extremely Well)

```
X
  1
       2
          3
             4
                5
                        My friends DO NOT use a reusable water bottle
X
  1
          3 4
                5
                        Bottled water is more convenient
X 1 2
         3 4 5
                        Bottled water is cleaner
      2
X 1
          3 4 5
                        Bottled water tastes better
      2
          3 4 5
X 1
                        I do not want to spend money on a reusable water bottle
      2
X
  1
          3 4
               5
                        Other: Please explain
```

6. To what degree do the items below match your attitude about receiving the short presentation in class about bottled water usage:

(X=No Opinion 1=Not at all 2= Not Very Well 3=Somewhat 4= Pretty Well 5= Extremely Well)

X	1	2	3	4	5	I found the information very interesting
X	1	2	3	4	5	I found the pictures to be effective
X	1	2	3	4	5	It influenced me to use a reusable water bottle
X	1	2	3	4	5	I did not learn anything new
X	1	2	3	4	5	I disagree with the information
X	1	2	3	4	5	I was not in class this day
X	1	2	3	4	5	I do not remember receiving it
X	1	2	3	4	5	Other: Please explain

Michigan Community Scholars Program Study

Survey:

- 1. Do you still use the reusable water bottle that you were given by MCSP in the beginning of the school year?
 - a. Yes
 - b. No
- 2. If you answered YES, to what degree do the items below match your reasons for using the MCSP reusable water bottle?

(X=No Opinion, 1=Not at All, 2=Not Very Well, 3=Somewhat, 4=Very Well, 5=Extremely Well)

X	1	2	3	4	5	Most of my friends use a reusable water bottle
X	1	2	3	4	5	Carrying it around allows me to represent MCSP
X	1	2	3	4	5	It saves me money
X	1	2	3	4	5	It is convenient
X	1	2	3	4	5	It is good for the environment
X	1	2	3	4	5	I like the design of it
X	1	2	3	4	5	Other: Please explain

3. If you answered NO, to what degree do the items below match your reasons for NOT using the MCSP reusable water bottle?

(X=No Opinion, 1=Not at All, 2=Not Very Well, 3=Somewhat, 4=Very Well, 5=Extremely Well)

X	1	2	3	4	5	Most of my friends DO NOT use a reusable water bottle
X	1	2	3	4	5	I use a different reusable water bottle
X	1	2	3	4	5	Bottled water is more convenient
X	1	2	3	4	5	Bottled water is cleaner
X	1	2	3	4	5	Bottled water tastes better
X	1	2	3	4	5	I do NOT like the design of it
X	1	2	3	4	5	Other: Please explain

Graphs:

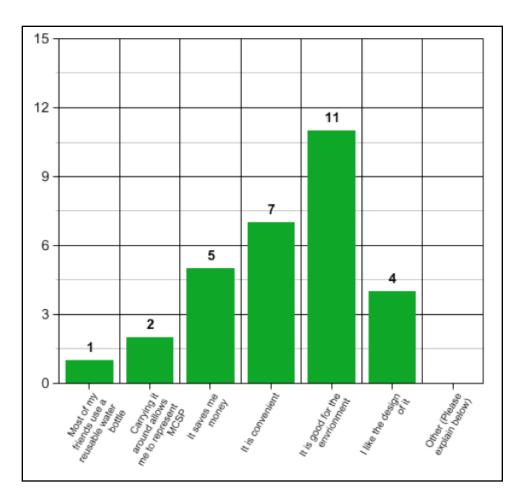


Figure 6: The number of respondents that answered "Extremely Well" in the MCSP Survey when asked, "If you still use the MCSP reusable water bottle, to what degree do the following items match your reasons for using it?" 23 students responded to this question.

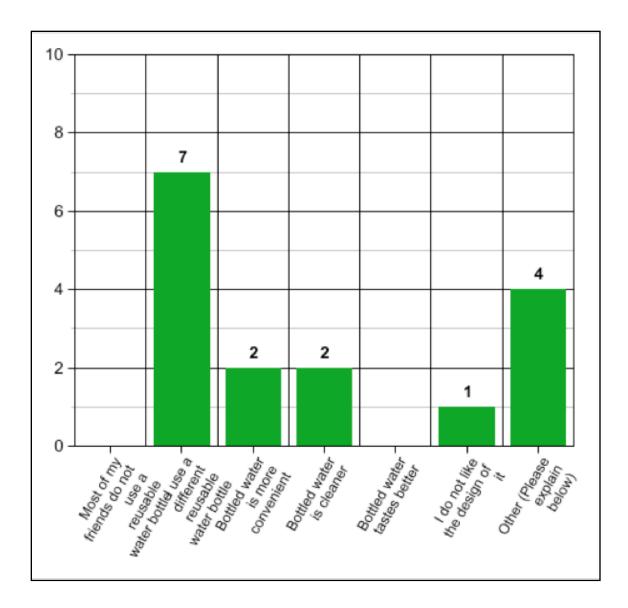


Figure 7: The number of respondents that answered "Extremely Well" in the MCSP Survey when asked, "If you do not use the MCSP reusable water bottle, to what degree do the following items match your reasons for not using it?" 14 students responded to this question.

Focus Group Study

Focus Group Questions:

- 1. How long have you been using reusable water bottles?
- 2. What led you to use a reusable water bottle?
- 3. Have your reasons to use a reusable water bottle changed since then?
- 4. Why do you think people choose not to use reusable water bottles/buy disposable water bottles?
- 5. What do you think could change this/encourage more people to use reusable water bottles?
- 6. Do you feel that there are any social norms at play concerning water bottle usage?
 - a. In environmental classes?
 - b. In non-environment classes?