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Using the Theory of Planned Behavior to Understand the Behavioral Use of Single-Use Plastic Bags by Students at the University of Nebraska-Lincoln

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USING THE THEORY OF PLANNED BEHAVIOR TO UNDERSTAND THE BEHAVIORAL
USE OF SINGLE-USE PLASTIC BAGS BY STUDENTS AT THE UNIVERSITY OF
NEBRASKA-LINCOLN

An Undergraduate Thesis Proposal

By Josephine Stoessel

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For the Degree of Bachelor of Science/Art

Major: Environmental Studies

Emphasis Area: Campus sustainability

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Thesis Reader: Name: Anna Oetting

Lincoln, Nebraska

Date: April 30, 2021

USING THE THEORY OF PLANNED BEHAVIOR TO UNDERSTAND THE BEHAVIORAL
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University of Nebraska-Lincoln, 2021

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Abstract

Reduction in the use of single-use plastic bags is a necessary sustainability step as it will reduce pollution of air, soil, waterways, and ingestion by marine animals. The Theory of Planned Behavior is used in this study to determine which components are the influencing factors for why students at the University of Nebraska-Lincoln use single-use plastic bags. An understanding of these factors allows for suggestions and recommendations for actions that can be taken by the university to combat this environmental issue. EcoCoin is an incentive-based program created by Penn State, and is the focus of this study. The literature review of this study looks at the successes and failures of bans and incentive-based programs used to reduce the distribution and use of single-use plastic bags. A one-time survey using the program Qualtrics was distributed to UNL students through convenient participation. The goal of the survey is to determine the factors contributing to why students use single-use plastic bags, where they use them, and what they do with them afterward. Attitude and perceived behavioral control are the two Theory of Planned Behavior factors that influence students' use of single-use plastic bags. A majority of survey respondents answered that they would participate in an incentive-based program like EcoCoin and would find it a worthwhile method to reduce their use of single-use plastic bags. As indicated by the survey results the EcoCoin program would be most effective if implemented at restaurants and the UNL bookstore as these are the two locations where most students are using

single-use plastic bags. With UNL students wanting to reduce their use of single-use plastic bags the university needs to provide them with the resources to do so.

Preface

I would like to thank Dr. Prabhakar Shrestha for advising and assisting me throughout the entirety of this project. I would like to thank Anne Oetting for being the reader of this thesis and taking on the role partway through the process. I would like to thank Emily Kleinschmit, Julien Arlt, and Natalie Plewa for distributing the survey to their sororities and fraternities. I would also like to thank Dr. Dave Gosselin for both assisting me throughout the process and for helping to distribute the survey as well. Lastly, I would like to thank my mother Susan Stoessel for supporting and assisting me throughout this process.

Introduction

As time goes on, concerns grow over the use of single-use plastic shopping bags. This concern has led to worldwide reduction efforts. Over the past 30 years, it has become more common to use a single-use shopping bag than a reusable cloth shopping bag (Carmichael, 2006). Worldwide it is estimated that humans use 500 billion bags a year. That equates to the use of 1 million bags every minute (Carmichael, 2006). Starting in 2002, countries and cities began placing bans and taxes on the distribution of single-use plastic shopping bags (Chasse, 2018). California has successfully passed legislation to change the production and use of single-use plastic bags within the state. Nebraska has not implemented any of these changes yet. Even though a policy has not been passed, it is apparent that this would be of interest to the university, due to recent and continuous efforts to make UNL a more sustainable campus. Sustainability efforts include all areas from waste reduction to fossil fuel divestment. The reduction in the use of single-use plastic bags on UNL's campus would reduce the amount of plastic waste produced on the campus and provide beneficial change to the campus and the Lincoln community.

The goal of this paper is to explore the program EcoCoin and its potential implications on changing the behavioral use of single-use plastic bags by students at the University of Nebraska-Lincoln. EcoCoin is an incentive-based program aimed at reducing the distribution of single-use plastic bags at the University of Nebraska-Lincoln and is modeled off of the incentive program implemented at Penn State in the Fall of 2018. How it works: if a customer purchasing at Herbie's Market, the convenience stores on campus, refuses or says no to a single-use plastic bag, then they are given an EcoCoin. That EcoCoin represents a 5-cent donation. The customer then chooses which student organization to receive the 5 cent donation. Customers can choose from three campus organizations that support sustainability efforts at UNL.

This initiative began after a group of Sustain UNL members became interested in reducing the amount of waste produced on campus. Sustain UNL is a recognized student organization on UNL's campus that promotes creating a sustainable world through activism, education, and service engagement. This group of students saw the issue of single-use plastic bags as an area where UNL could improve its efforts. They identified that this issue could be resolved by switching to an alternative type of bag, implementing a program that promotes change, or placing a ban. After researching how other universities in the nation were handling the issue, the students decided that a ban would not be the most effective method and that an incentive program would be a better option. In order for an action to take place on campus, this issue needed to be addressed on the Spring 2018 ASUN Ballot, in the form of a question. Tabling was used to collect the required number of signatures to get the question on the ballot. The exact question stated on the ballot is as follows: Should the University of Nebraska-Lincoln ban the distribution of plastic bags on all campuses including, at bookstores, c-stores, vendors, and any other distributors? Of the UNL students who responded to this question, 66% or 2497 voted yes in support of the ban and 23% or 864 students voted no or not in support of the ban. 11% or 420 students voted indifferent in response to the question. These results show that UNL students support a ban on single-use plastic bags on campus. Due to these results, a dedicated group of students began figuring out how to meet UNL students' desire to reduce the use of plastic bags on campus.

The implementation of EcoCoin benefits UNL's goal of creating a campus culture that strives for zero-waste and materials management through a circular economy (Office of Sustainability, 2020). In the CERC master plan, a strategy to achieve this goal is reducing plastic packing on purchases and food services. The EcoCoin program is one method that the university

could use to promote waste reduction to students and reduce the amount of waste produced, working to meet the zero-waste goal. The master plan states a short-term objective of a landfill waste diversion rate of 80%. In addition to the stated objectives, there is a list of actions. One action to help achieve this goal is to incentivize the use of reusable containers. EcoCoin is an example of an incentive program that promotes this action on campus and can help achieve the goal of a zero-waste campus at UNL.

Waste management and student engagement are two categories that are used in the STARS rating system. This rating system is used by colleges and universities to determine where they rank and score in terms of sustainability. UNL's sustainability ranking has improved from an initial bronze to its most recent score of silver (Office of Sustainability, 2020). UNL already has a high student engagement score of 93.2%, campus engagement (24.19/21) and public engagement (14.05/20). It could be expected that UNL students would be willing and motivated to participate in the EcoCoin program. UNL's waste management score is 5.6/10; reducing single-use plastic bags would help improve the score.

It is unknown whether this project will succeed at changing students' behaviors and reducing the amount of single-use plastic on campus. What is meant by the phrase "behavioral change" is that once a student participates in an EcoCoin exchange, they will then continue to refuse single-use plastic bags, thus reducing plastic waste both on campus and outside of campus. The theory is that an incentive-based program like EcoCoin promotes a change in the behavioral use of single-use plastic bags by UNL students. To determine the success of this program, the Theory of Planned Behavior (TPB) (Ajzen, 1991) will be used. This theory uses attitude, subjective norm, and perceived behavioral control to predict whether intentions translate to action or behavior. In TPB, attitude relates to whether the person has a favorable or

unfavorable opinion of the specific behavior. Subjective norms are determined by the perceived social pressure one feels to perform or not perform a behavior. Perceived behavioral control refers to the ease or difficulty of performing the specific behavior and is a reflection of past experiences and the anticipated challenges.

One objective of this study is to compare the success and failures of two types of methods used to reduce single-use plastic bags. The first method is an incentive-based program. In an incentive program, the person receives a reward or recognition for acting in the desired manner. In the case of EcoCoin, this would mean getting a reward or recognition for refusing a single-use plastic bag. The second method is a levy or tax, which involves taxing the customer for using a single-use plastic bag and/or taxing the retailer distributing the single-use plastic bags. The purpose of looking at both of these methods is to understand how effective the two types are at promoting a behavioral change in the use of single-use plastic bags. Homonoff used transaction-level scanner data from a large retail chain of grocery stores in several areas where a regulation had been implemented in the Washington Metropolitan Area (Homonoff, 2012). The data includes whether or not the customer was charged for the use of a store-provided paper or plastic bag. The method of tax programs has shown to be effective at curbing the use of unhealthy behaviors. After a customer has to pay a tax for using a plastic bag, they were more likely to reduce their use of plastic bags in future trips. Homonoff's results suggest that a 5-cent incentive for using reusable bags is a way to promote the use of reusable bags over plastic bags (Homonoff, 2012). Another factor used to determine the success and failure of these methods was an evaluation of the reduced amount for the area after the enforcement of an incentive program or a tax program.

The second objective is to determine how students at UNL are currently using single-use plastic bags and their opinions on the issue. An understanding of why students are using single-use plastic bags needs to be determined to achieve this objective. Understanding the reason behind the behavioral use of single-use plastic bags gives a perspective on how the project should approach its enforcement. This knowledge about the audience will better help determine how to approach informing students and the university about the need to change this behavior. This is the objective that uses the Theory of Planned Behavior.

To gauge how successful this program can be, it needs to be known how students at other universities view the problem of single-use plastic bags and if they are willing to make a behavioral change in response. Using information gathered from other universities on this topic can provide us with an understanding of how college students view this topic and issue. This relates to knowing the target audience and how to approach them. Miller's study on University of Alabama Plastic Bag Attitude and Behaviors is a primary reference for this study.

The purpose is to determine if the enforcement of an incentive-based program on UNL's campus will both reduce the amount of plastic waste produced by the university and change the student's behavioral use of single-use plastic bags.

Why are Plastics an Issue?

Plastics are inexpensive, require minimal maintenance, and are resistant to corrosion. Single-use plastics bags become the norm for use while shopping because they are cheaper than other materials and allow for single-use.

There are several reasons why single-use plastic bags are harmful and should not be used. A significant amount of research identifies that the micro-plastics from single-use plastic bags are affecting marine and freshwater organisms. Single-use plastic bags are not being properly

disposed of, causing them to end up in waterways (Ivleva, 2017). Not only are the micro-plastics affecting marine life, but they are also littering coasts and beaches. Pollution of beaches has caused marine life to become entangled or die from mistaking the plastic for food. It cannot be concluded that single-use plastic bags alone are causing this harm, but they do account for some part. It is estimated that 90% of the floating litter in oceans is from plastics (Ruch, 2007).

There are conflicting timeframes for how long it takes for a plastic bag to break down. The breakdown process of plastic bags into smaller and smaller pieces is termed a photo-degrade. These tiny pieces then contaminate soil and waterways. Once in soil or waterways, they then enters the food chain when accidentally ingested by animals, primarily marine animals (Ruch, 2007). This information supports the idea that the pollution caused by plastic bags is a problem concerning everyone, regardless of living on or near the coast.

A reduction in plastic bag use reduces the amount of plastic waste sent to landfills and the amount of non-renewable fuels needed to transport the waste to the landfills. A change in the behavioral use of single-use plastic bags promotes a change in the overall use of plastic, thus resulting in a reduction of the amount of plastic produced in the packaging industry. The ecological footprint of plastic production is reduced as a result of these changes. The outcome of a reduction in plastic use is less pollution of waterways, soil, and beaches, and less use of fossil fuels and non-renewable resources to produce the plastics.

Banning plastic bags makes an environmental difference. A reduction in the amount of single-use plastic shopping bags has been known to result is an increase in the purchase of plastic trash can liners because people were reusing single-use plastic shopping bags as trash can liners. A reduction in one type of plastic waste caused an increase in a different type of plastic waste. In 2013 the city of Austin, Texas, passed a ban on single-use plastic shopping bags. The goal of the

ban was to reduce the amount of waste produced by the city. After two years, the city evaluated its progress. The evaluation found that yes, there was a reduction in the amount of single-use plastic bags that customers were using. The residents were “treating the reusable bags like single-use bags” (Minter 2015). This shows a pattern of reduction in one type of waste, but an increase in another. Minter contributed this result to a lack of education by the city. This case study is an example where a lack of education and information for the public caused the ban to fail. This conclusion is an important concept that requires consideration when evaluating alternative bags and how current UNL students might be reusing the single-use plastic bags that they get on campus.

Attitudes and Behaviors

Reducing the use of single-use plastic bags would conform to the New Environmental Paradigm (NEP). This is a belief that there are limits to growth. There needs to be a balance of economic growth with environmental protection, to preserve the balance of nature, and for humans and the natural world to live in harmony with one another. People are more likely to express support for environmental principles but are less likely to engage in environmentally protective behaviors (Scott, 1994). This idea brings up a concern relating to the results of the ASUN Ballot for EcoCoin: that students have an attitude on the issue of single-use plastic bags on campus, but that this attitude does not translate into their behaviors. This concern brings up the psychological term of cognitive dissonance. Cognitive dissonance is a term describing the discomfort experienced by a person having a conflict between behaviors and beliefs. The idea is that people are more likely to change their attitudes and not their behaviors when discomfort arises (Miller, 2011). Another concern is that students would be more likely to have a change of

attitude concerning the program instead of having a change of behavior. Through small-scale surveys of university students, it has been concluded that sustainability practices, attitudes, and perspectives of natural resources come from the major factors of past experiences, family, place of growth, and significant life experiences (Tuncer & Sahin, 2016).

Even though plastic bags make up a small portion of municipal waste, the practice of refusing to use a bag shows a behavior change. This action then symbolizes larger participation in sustainability, thus helping to change the relationship between humans and the waste that they produce (Miller 2011). Awareness of the need to reduce plastic waste leads people to become more conscious of all types of waste that they produce. Increasing the number of people who are conscious of the waste they produce could lead to a decrease in the volume of waste produced on a larger scale.

It is evident that plastic waste is an issue that affects everyone and should be an issue of concern for UNL and its students. A change in attitude toward single-use plastic bags is needed for the change in the behaviors of students relating to their use of single-use plastic bags on UNL's campus.

Methods

The research design was a one-time survey administered to UNL students through Qualtrics. An explanatory research design was used to determine how the attitudes, subjective norms, and perceived behavioral control of students' affect their future involvement in the EcoCoin program. The survey was used to gain an understanding of UNL student's perception of the EcoCoin program, the current behavioral use of single-use plastic bags by students on campus, their level of concern for plastic bags and programs that reduce their use on campus, and

whether the students are looking to or willing to change their use of plastic bags after completing the survey or participating in the program. The survey included a list of questions referencing the topics just listed. There were two to four questions for each of the Theory of Planned Behavior components. There was also a question asking specifically about the participant's intention to reduce the use of single-use plastic bags following the completion of the survey. The survey also included questions regarding students' opinions on the sustainability efforts of UNL Housing and Dining Services.

The survey was distributed to UNL students during the Spring 2021 academic semester. The online Qualtrics survey was distributed to UNL students starting March 23, 2021 and ending March 29, 2021. One goal was to receive 50 usable responses. Another goal was to get responses from students in a wide variety of colleges and majors. Participants in this survey were required to be nineteen years old and a current student at the University of Nebraska-Lincoln.

The survey was distributed using convenient participation. This included sending the link to the UNL Sororities Kappa Delta (183), Kappa Kappa Gamma (193 and an additional 8) and Fraternity Kappa Sigma (75), Registered Student Organization Sustain UNL (190), Environmental Studies majors (104), and posted on Student Affairs website with a QR code .

This design method was chosen because it is the best method for gaining a perspective and understanding of the views of students. Justification for the chosen method is that a similar survey was conducted by Miller at the University of Alabama to determine students' attitudes and behaviors regarding single-use plastic bags on the UA campus (Miller, 2011). Another justification for this method is that a survey using the Theory of Planned Behavior was used to learn students recycling attitudes, intentions, and behaviors at the University of Nebraska-

Lincoln (Sonnenfeld, 2018). In addition to this method of research being used at universities, it has also been used to understand recycling in Athens, Greece (Ioannou et. Al 2013), household food waste (Graham-Rowe et. Al 2015), household waste sorting (Zhang et. Al 2019), and sustainable food consumption (Vermeir and Verbeke, 2008).

With the primary investigation of this research being a study involving the participation of human subjects, it was required that the work be done per university policy. Online ethical training and testing were completed by the researcher. The researcher completed the CITI training course necessary to conduct this survey. The information collected in this survey is only used for a University of Nebraska-Lincoln student's undergraduate thesis. The information gathered is confidential. No direct references are made to individual names.

After the survey was administered, tables, graphs, and charts are used to understand the results. Qualtrics is the program used to conduct this survey because it does not require nor attach an email account to the responses. The results from the survey determined how influential attitude, subjective norm, and perceived behavioral control relate to if student's intent to reduce their use of single-use plastic bags on campus. The responses show which of the three components of TPB has the most influence on students' behaviors.

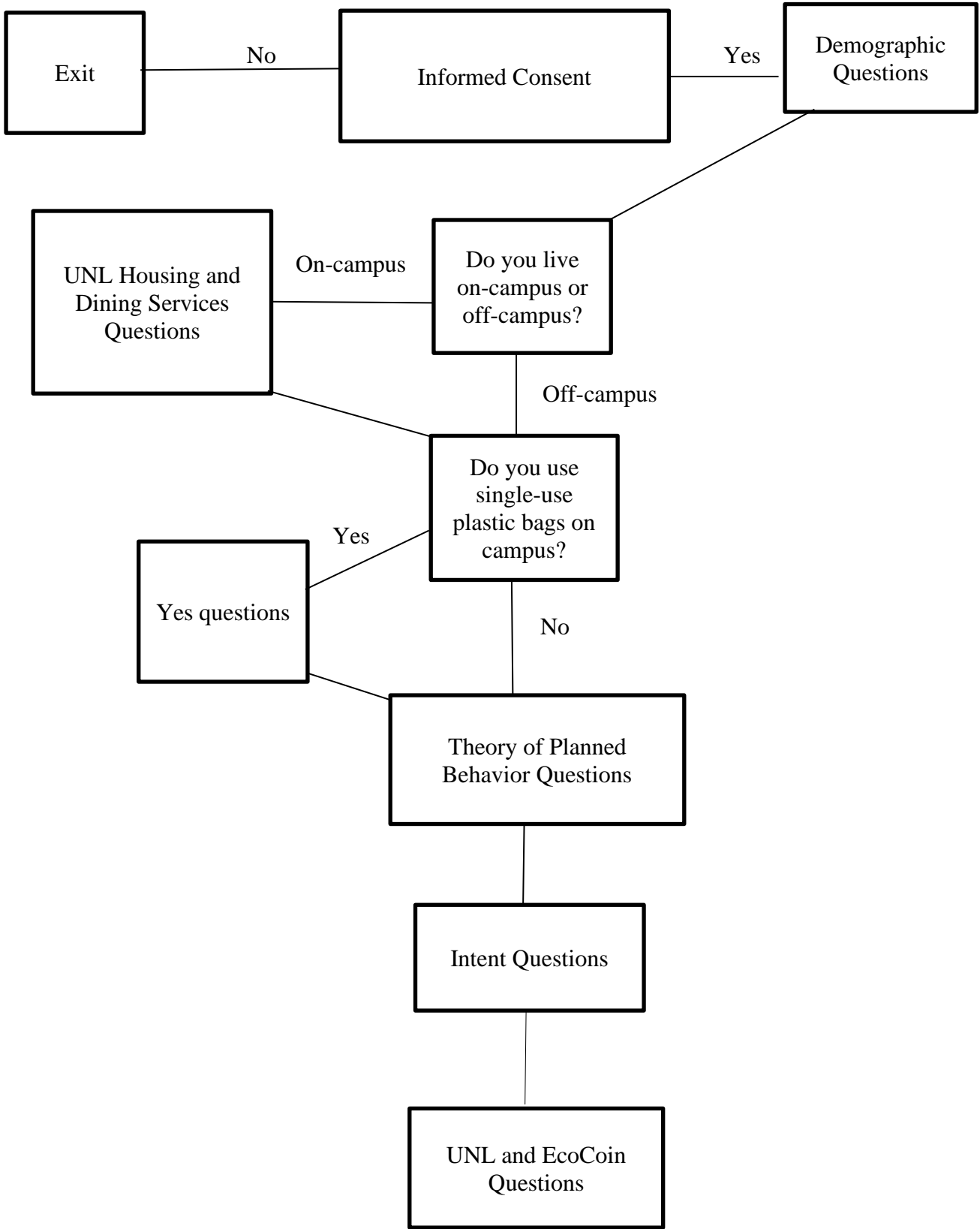


Figure 1: The Flow Chart Indicated the Different Steps UNL Students Took While Filling Out the ‘Understanding UNL Student’s Behavioral Use of Single-Use Plastic Bags on Campus’ Survey During Spring 2021.

Results

There was a total of 75 responses to the survey with 62 of the 75 being usable. Criteria for usable surveys included: participants were 19 years or older, agreed to the participation statement, and completed the entire survey.

The student participants began by filling out general demographic information.

Table 1: Age

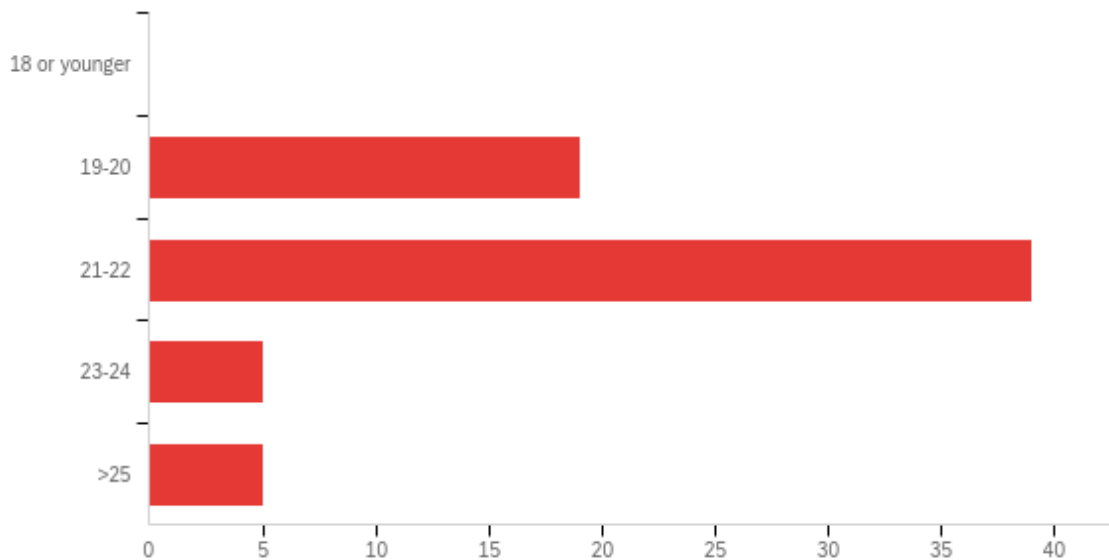


Table 1: The majority of participants were in the age range of 21-22, 39 participants. The other age ranges were 19-20, 19 participants, 23-24, 5 participants, and >25, 5 participants.

Table 2: What is your gender?

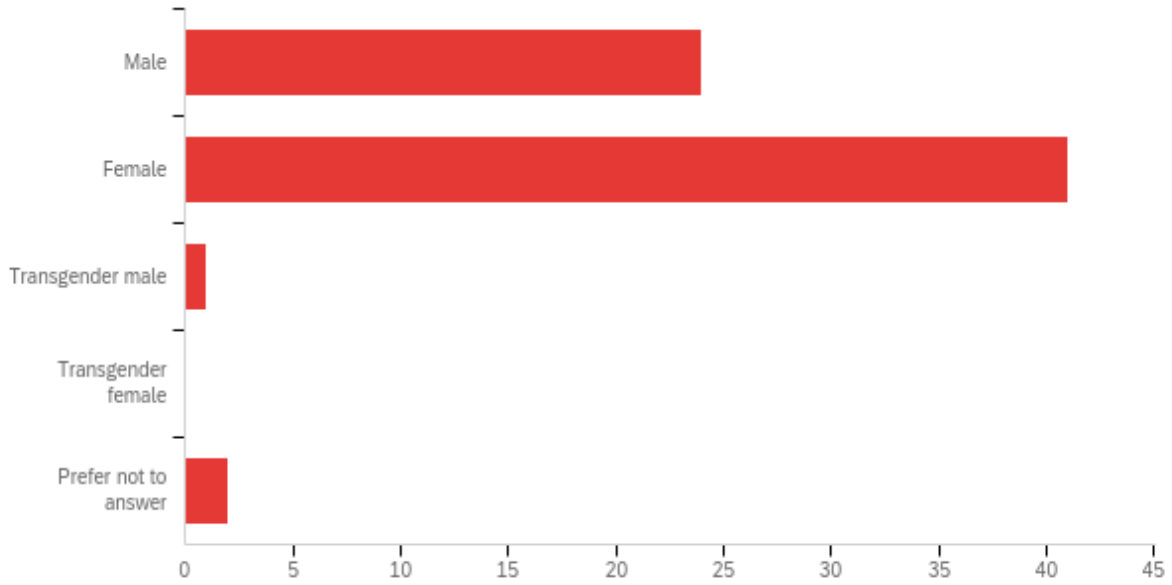


Table 2: The majority of responses were 41 for female, 24 for males, 1 for transgender male, 0 for transgender female, and 2 for prefer not to answer.

Table 3: What is your ethnicity?

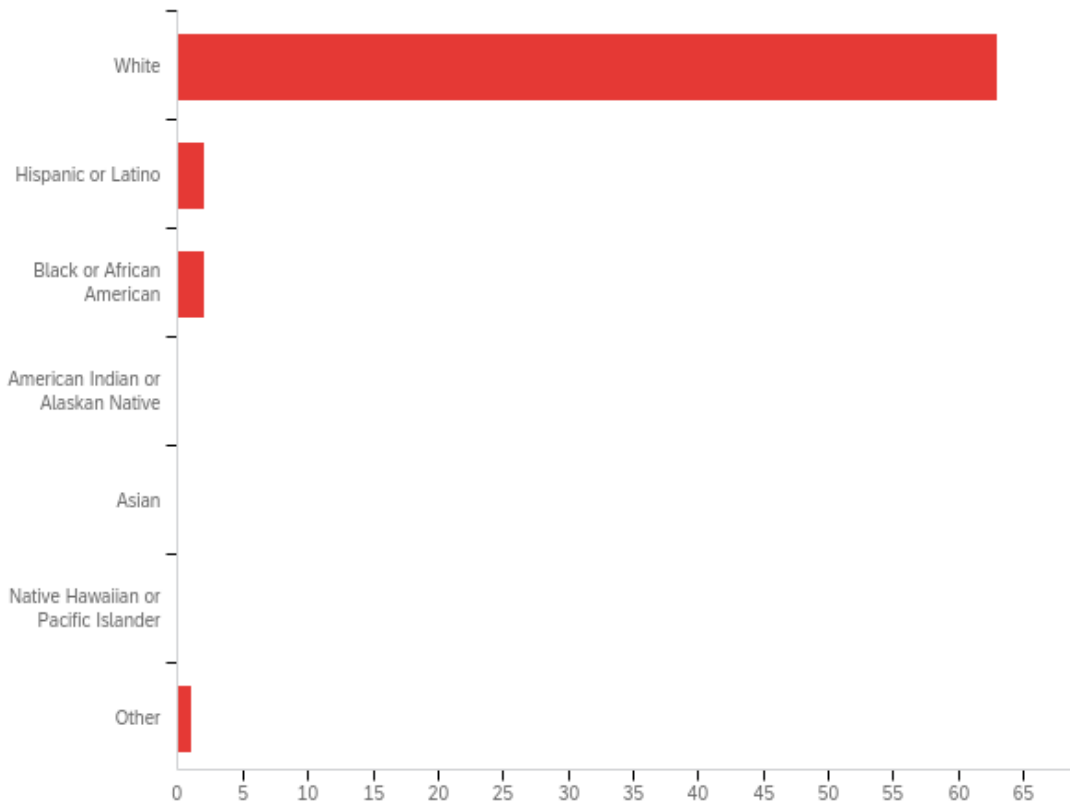


Table 3: A majority of the respondents identified their ethnicity as white, 63 participants. 2 participants identified as Hispanic or Latino and 2 participants identified as black or African American and 1 for other.

Table 4: What is your educational standing?

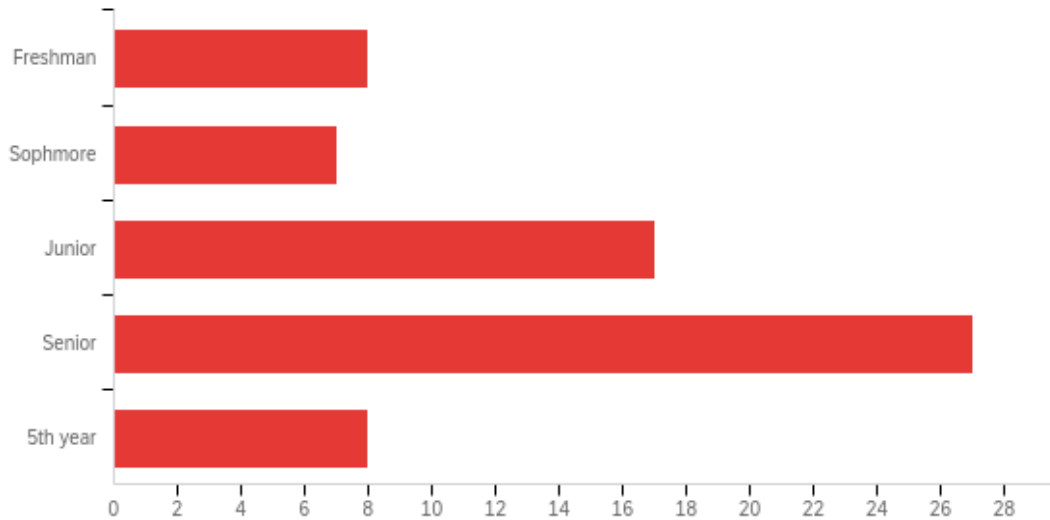


Table 4: The educational standing of the participants was a majority senior at 27 participants, followed by 17 junior, 8 freshman, 8 5th year, and 7 sophomores.

Table 5: Which college within the University of Nebraska-Lincoln do you represent, or if you have not yet declared a major, which college do you plan to join?

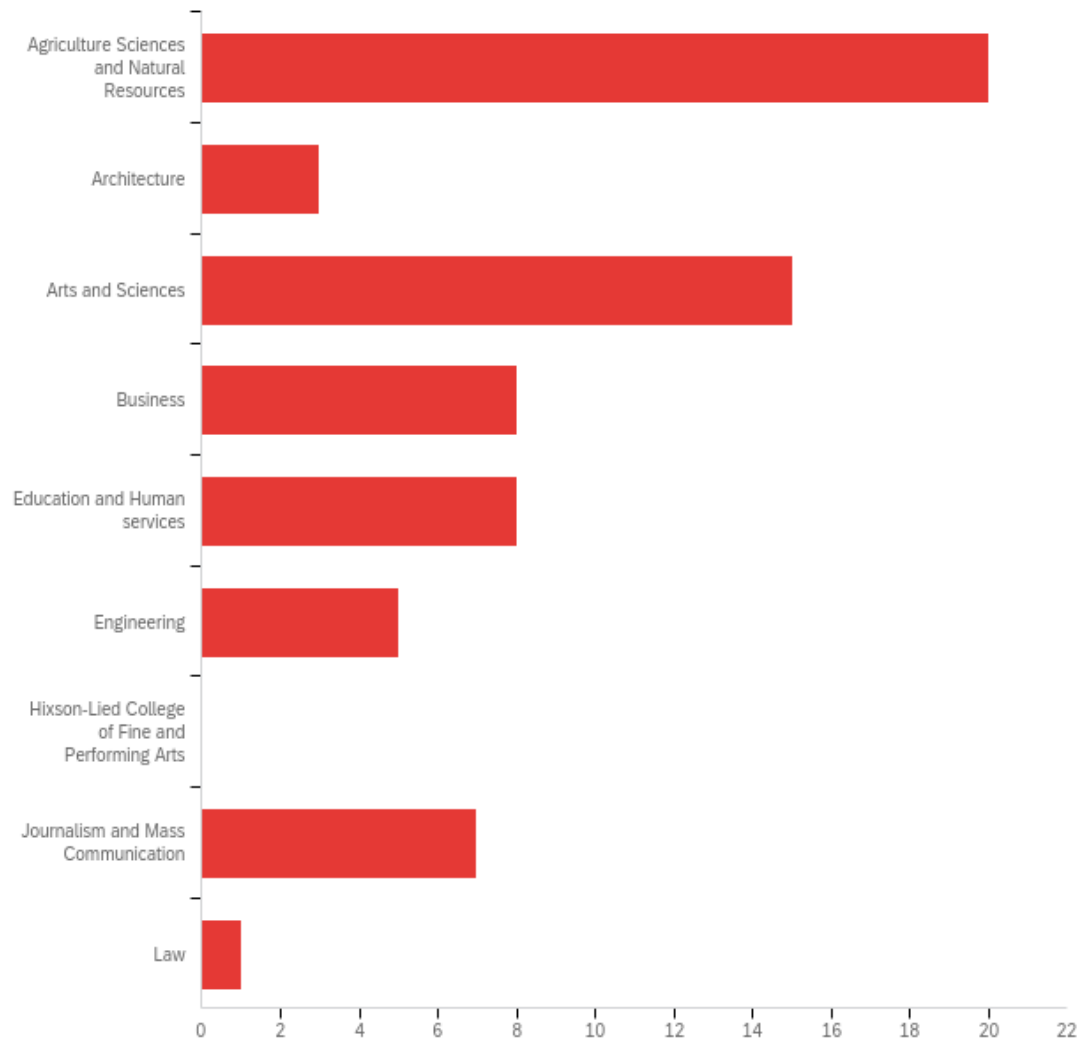


Table 5: The majority of the student participants were in the college of Agriculture Sciences and Natural Resources (20 participants), followed by Arts and Sciences (15 participants). Colleges that were less represented were Business (8 participants), Education and Human Services (8 participants), Journalism and Mass Communications (7 participants), Engineering (5 participants), Architecture (3 participants), and Law (1 participant).

Table 6: Do you live on campus or off-campus?

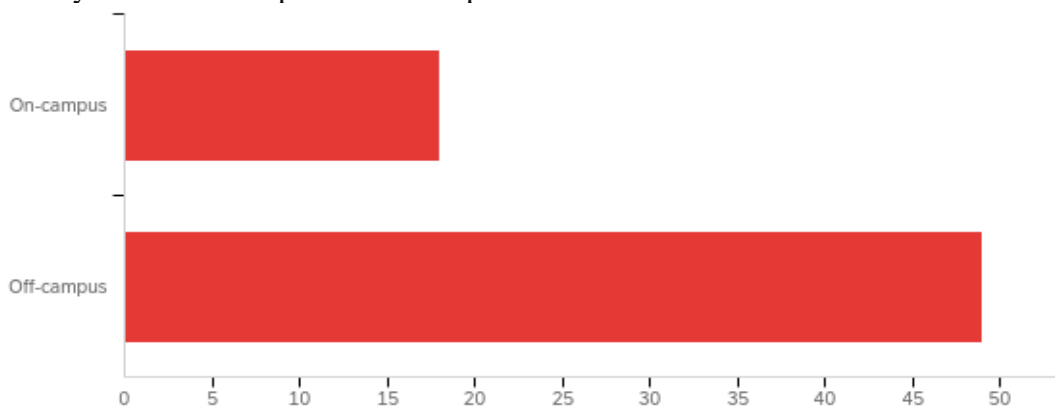


Table 6: The answer to this question determined the next set of questions. The results were 49 participants living off-campus and 18 participants living on-campus.

Table 7: Are you satisfied with UNL Housing and Dining Services current sustainability efforts?

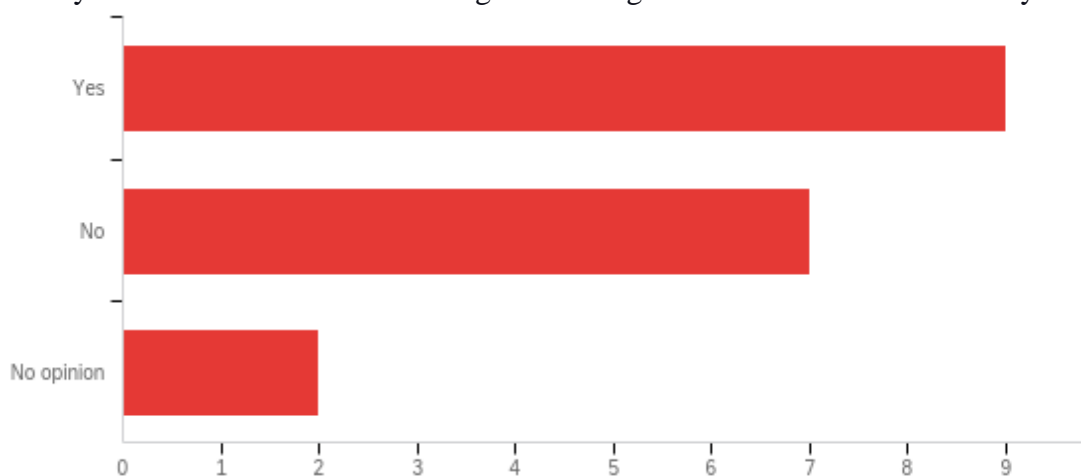


Table 7: If a participant answered that they live on-campus, they then asked a series of questions relating to the sustainability efforts of UNL Housing and Dining Services. The results show 9 participants yes, 7 participants no, and 2 participants no opinion. Those living on-campus were then asked: what would you recommend for UNL Housing and Dining to be more sustainable? The given suggestions were more organic food options, vegetarian food options, vegan options, and local food options. There were 6 participants who stated they wanted to see more vegetarian options in the dining halls. There were 5 participants who stated they wanted to see more local food options. There were 3 participants who stated they want less plasticware and more use of

the Ozzi. There were 4 participants who stated they want more organic options. 2 participants stated they want to see more recycling options. 1 participant stated they wanted to see more composting.

Table 7: Where did you grow up?

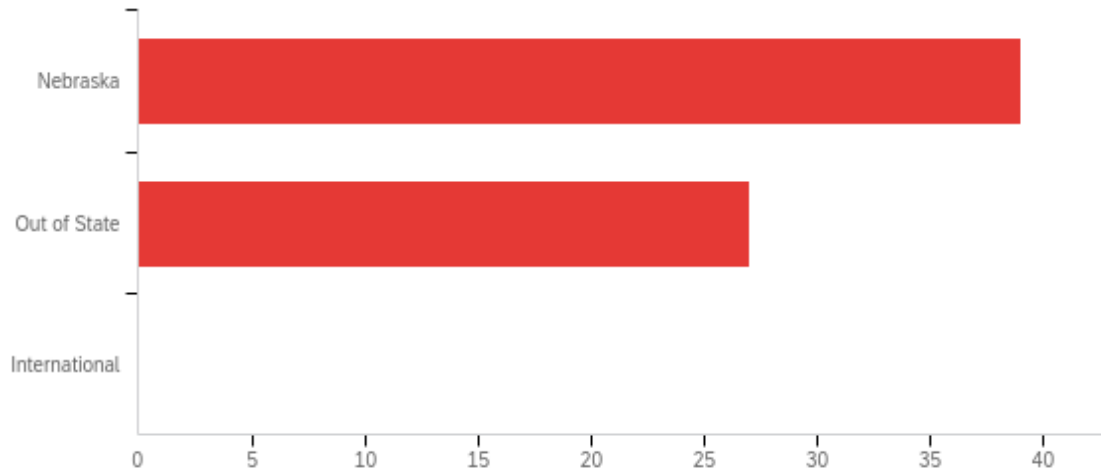


Table 7: The results were 39 Nebraska, 27 out of state, and 0 international.

Table 8: Is where you grew up mostly an urban area or a mostly rural area?

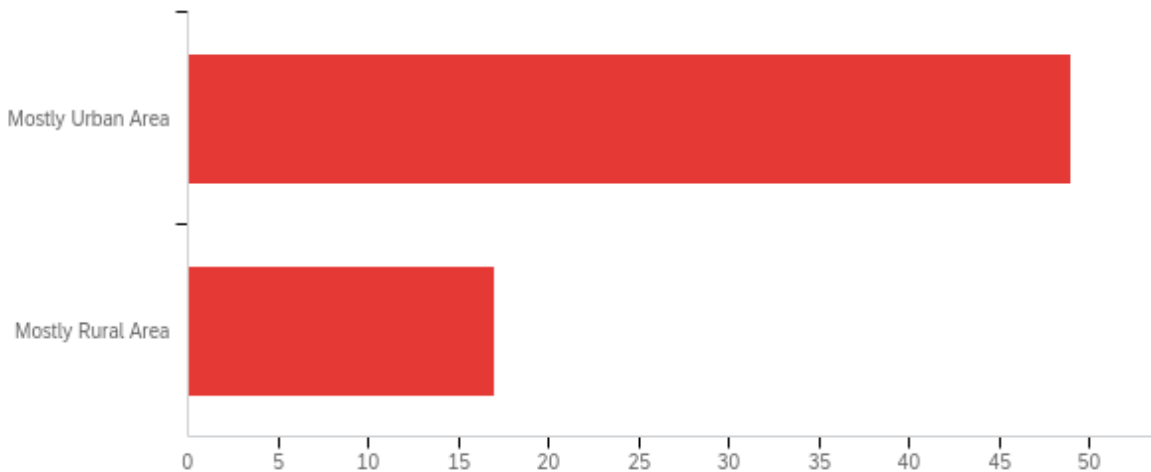


Table 8: The results were 49 mostly urban area and 17 mostly rural area.

Table 9: Do you use single-use plastic bags on campus?

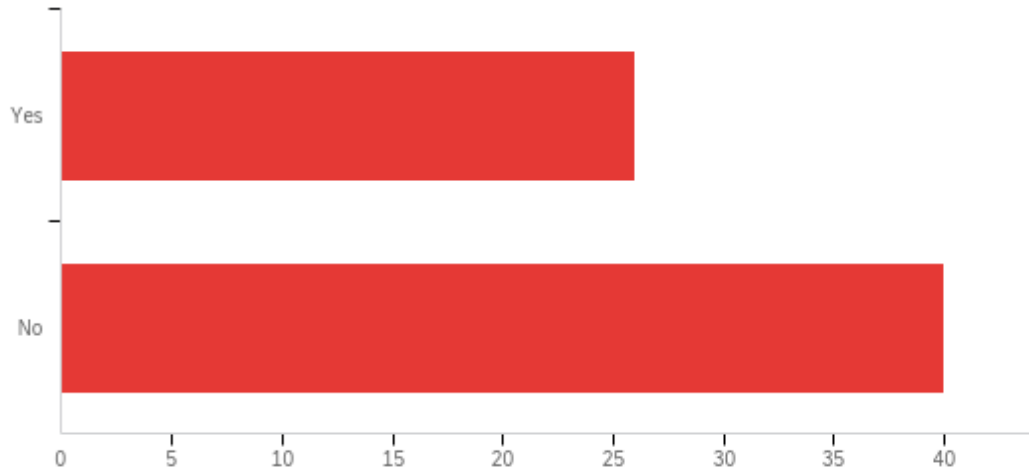


Table 9: 40 participants answered no, and 26 participants answered yes.

Table 9: How often do you use single-use plastic bags on campus?

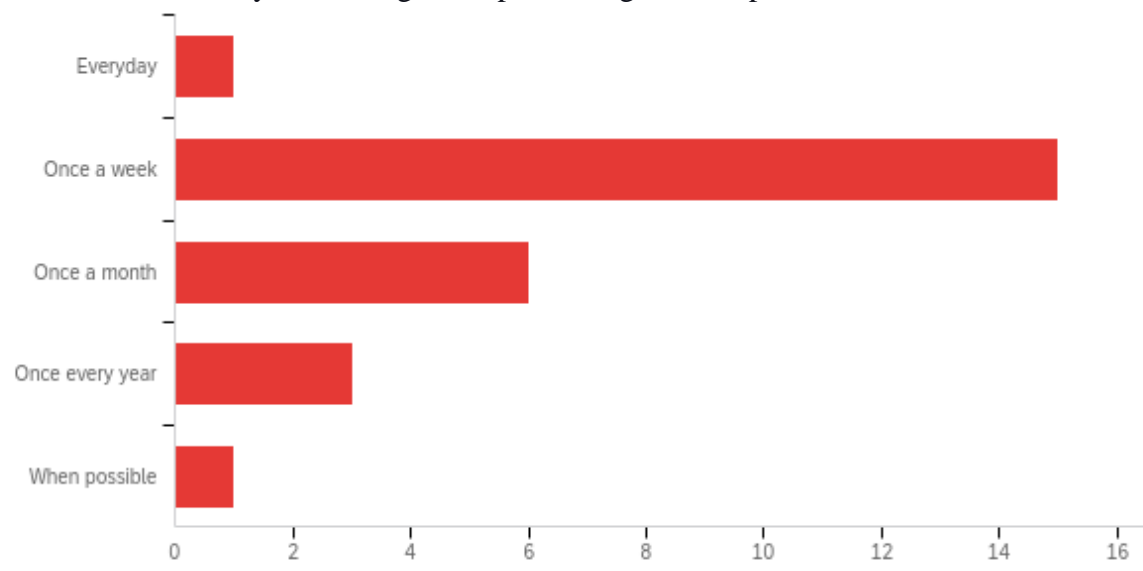


Table 9: Students who answered 'yes' to the previous question were then asked: to what degree do you use single-use plastic bags? The results were 1 participant every day, 15 participants once a week, 6 once a month, 3 participants once a year, and 1 participant when possible.

Table 10: Where do you use single-use plastic bags on campus?

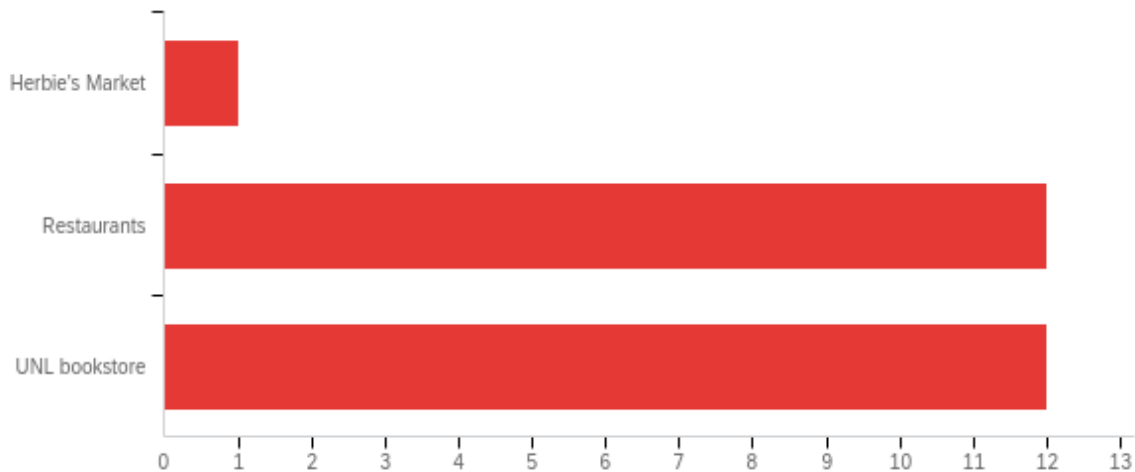


Table 10: The results were 1 participant at Herbie's Market, 12 participants at restaurants, and 12 participants UNL bookstore.

Table 11: What type of bag do you use when shopping on campus?

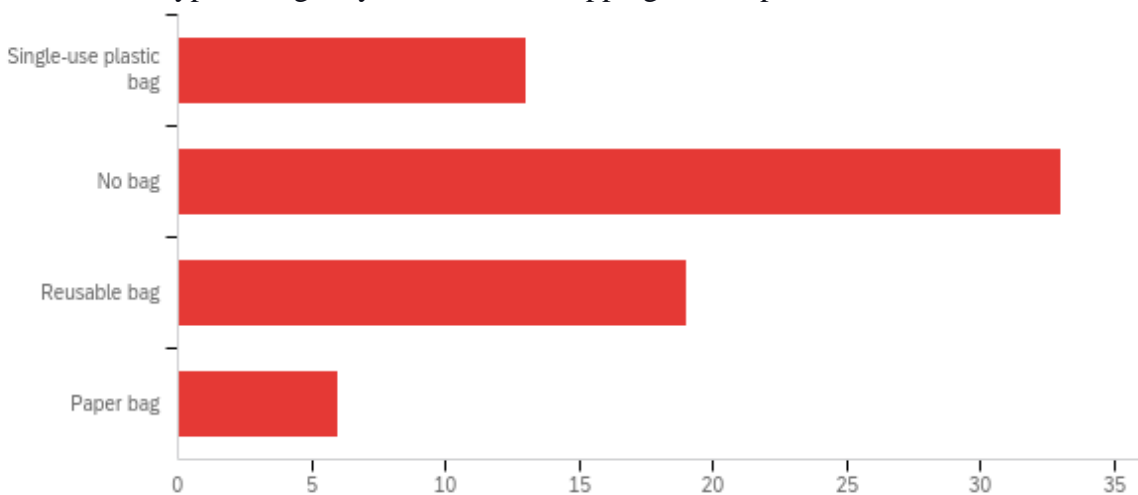


Table 11: The results show that a majority of students use no bag (33 participants), followed by reusable bag (19 participants), single-use plastic bag (13 participant), and paper bag (6 participants).

Table 12: Do you view single-use plastic bags as a necessary part of your shopping experience on campus?

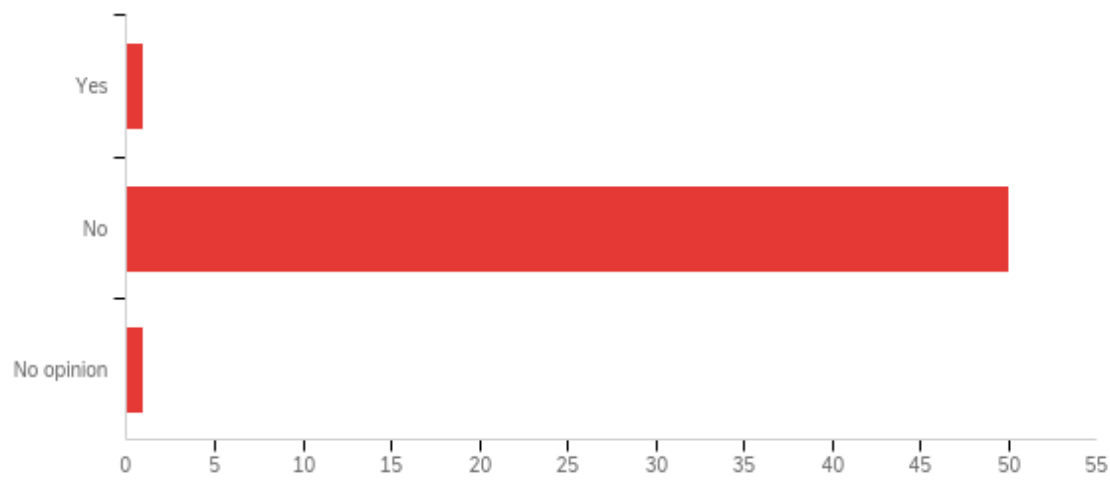


Table 12: The results of this question were 50 participants no, and 1 participant yes, and 1 participant no opinion.

Table 13: If you receive a single-use plastic bag from shopping on campus what do you do with the bag?

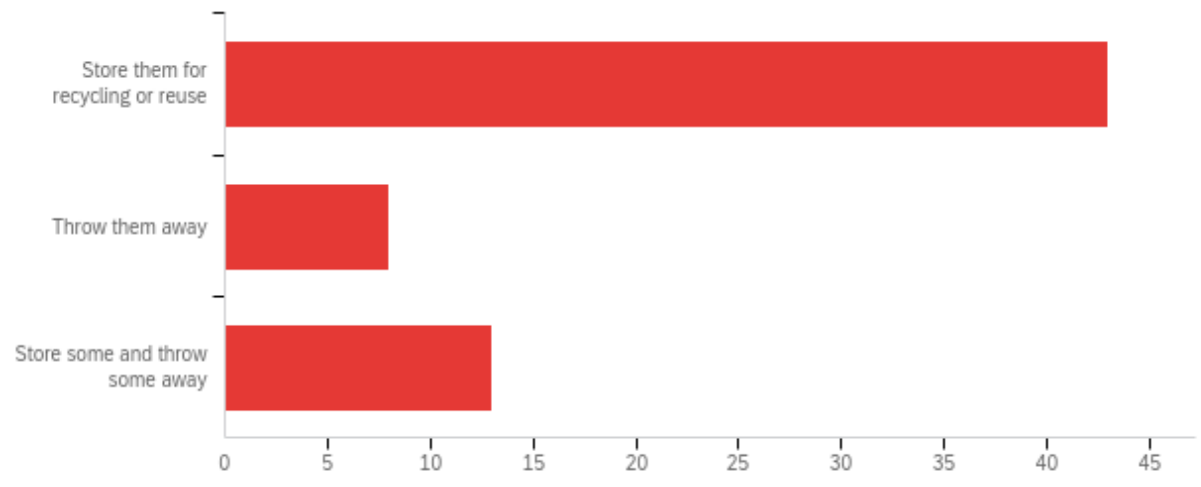


Table 13: Participants responses indicate that a majority of those who receive a single-use plastic bag on campus store them for recycling or reuse (43 participants), store some and throw some away (13 participants) and throw them away (8 participants).

Table 14: Theory of Planned Behavior Questions

#	Field	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
1	Reducing the use of single-use plastic bags does not make a difference.	4.84% 3	9.68% 6	8.06% 5	29.03% 18	48.39% 30	62
2	I regularly think about how my actions affect the planet Earth.	48.39% 30	29.03% 18	14.52% 9	3.23% 2	4.84% 3	62
3	Consuming environmentally friendly products has important and direct benefits to the environment.	50.00% 31	41.94% 26	4.84% 3	3.23% 2	0.00% 0	62
4	I feel social pressure from peers on campus to reduce my use of single-use plastic bags.	14.52% 9	19.35% 12	27.42% 17	30.65% 19	8.06% 5	62
5	People who are important to me want me to reduce my use of single-use plastic bags.	19.35% 12	24.19% 15	30.65% 19	17.74% 11	8.06% 5	62
6	I don't see others not using single-use plastic bags so I continue to use them.	1.61% 1	17.74% 11	27.42% 17	33.87% 21	19.35% 12	62
7	It would be an easy task for me to not use single-use plastic bags on campus.	53.23% 33	35.48% 22	4.84% 3	4.84% 3	1.61% 1	62
8	Single-use plastic bags are a source of pollution.	61.29% 38	32.26% 20	4.84% 3	1.61% 1	0.00% 0	62
9	Not using single-use plastic bags on campus takes too much time.	6.45% 4	4.84% 3	16.13% 10	35.48% 22	37.10% 23	62
10	I intent to reduce my use of single-use plastic bags.	45.16% 28	38.71% 24	12.90% 8	1.61% 1	1.61% 1	62

Showing rows 1 - 10 of 10

The participants were then presented with a series of nine statements and asked to indicate whether they strongly agree, agree, neither agree nor disagree, disagree, or strongly disagree.

For the statement ‘reducing the use of single-use plastic bags does not make a difference,’ the results were strongly agree (30 participants), disagree (18 participants), agree (6 participants), neither agree or disagree (5 participants), and strongly agree (3 participants).

The results of the statement I regularly think about how my actions affect the planet Earth were strongly agree (30 participants), agree (18 participants), neither agree or disagree (9 participants), strongly disagree (3 participants), and disagree (2 participants).

The results of the statement ‘Consuming environmentally friendly products has important and direct benefits to the environment were strongly agree (31 participants), agree (26 participants),

neither agree or disagree (3 participants), disagree (2 participants), and strongly disagree (0 participants).

The results of the statement 'I feel social pressure from peers on campus to reduce my use of single-use plastic bags' were disagree (19 participants), neither agree or disagree (17 participants), agree (12 participants), strongly disagree (9 participants), and strongly disagree (5 participants).

The results of the statement of 'People who are important to me want me to reduce my use of single-use plastic bags' were neither agree or disagree (19 participants), agree (15 participants), strongly agree (12 participants), disagree (11 participants), and strongly disagree (5 participants).

For the statement of 'I don't see others not using single-use plastic bags, so I continue to use them' participants answered that they disagree (21 participants), neither agree or disagree (17 participants), strongly disagree (12 participants), agree (11 participants), and strongly agree (1 participant).

For the statement of 'It would be an easy task for me to not use single-use plastic bags on campus' participants answered that they strongly agree (33 participants), agree (22 participants), neither agree or disagree (3 participants), disagree (3 participants), and strongly disagree (1 participant).

The results of the statement 'Single-use plastic bags are a source of pollution' were strongly agree (38 participants), agree (20 participants), neither agree or disagree (3 participants), disagree (1 participant), and strongly disagree (0 participants).

The results of the statement 'Not using single-use plastic bags on campus takes too much time' were strongly disagree (23 participants), disagree (22 participants), neither agree or disagree (10 participants), strongly agree (4 participants), and agree (3 participants).

Lastly, the results of the statement ‘I intend to reduce my use of single-use plastic bags’ were strongly agree (28 participants), agree (24 participants), neither agree or disagree (8 participants), disagree (1 participant), and strongly disagree (1 participant).

Table 15: I would use less single-use plastic bags if...

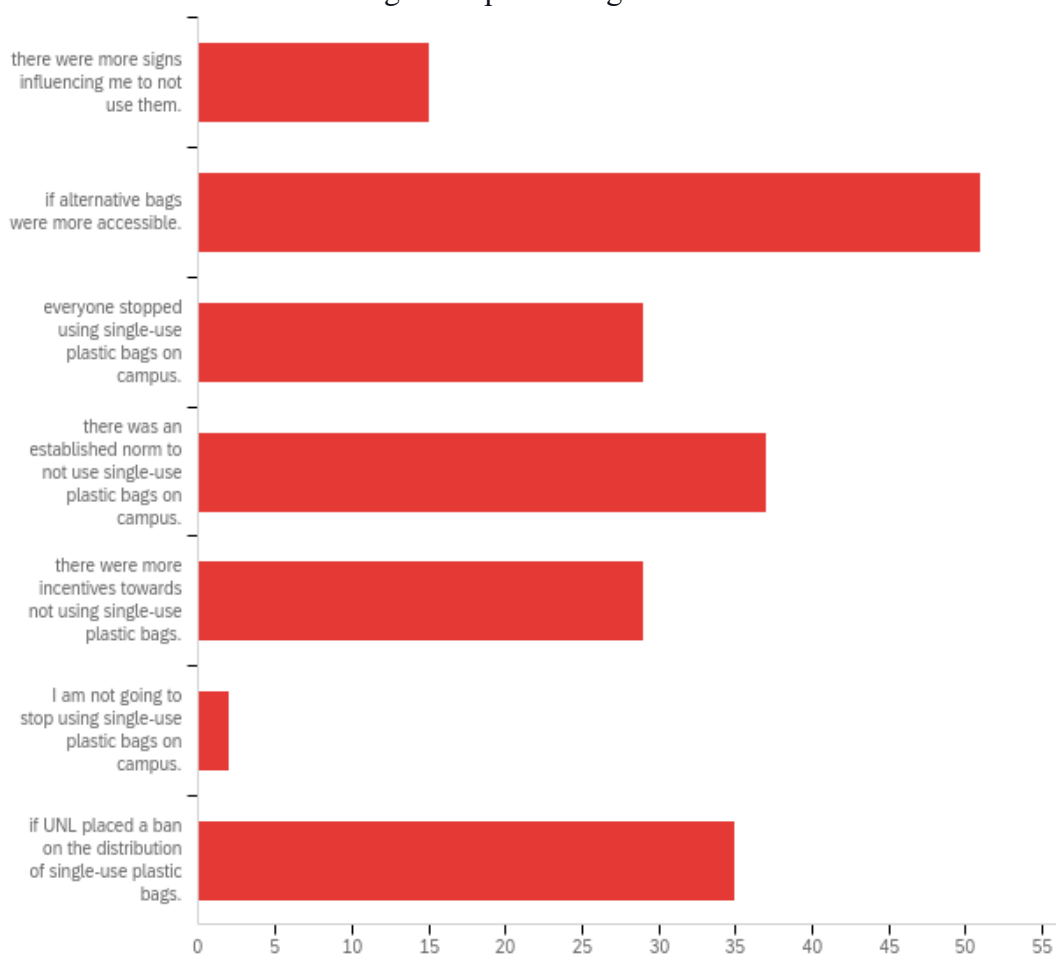


Table 15: The next question was ‘I would use less single-use plastic bags if...’ and participants were instructed to check all that apply. A majority of the responses indicated that if alternative bags were more accessible (51 participants), there was an established norm to not use single-use campus (37 participants), if UNL placed a ban on the distribution of single-use plastic bags (35 participants), everyone stopped using single-use plastic bags on campus (29 participants), there

were more incentives towards not using single-use plastic bags (29 participants), and I am not going to stop using single-use plastic bags on campus (2 participants).

Table 16: Should UNL encourage students to use less single-use plastic bags on campus?

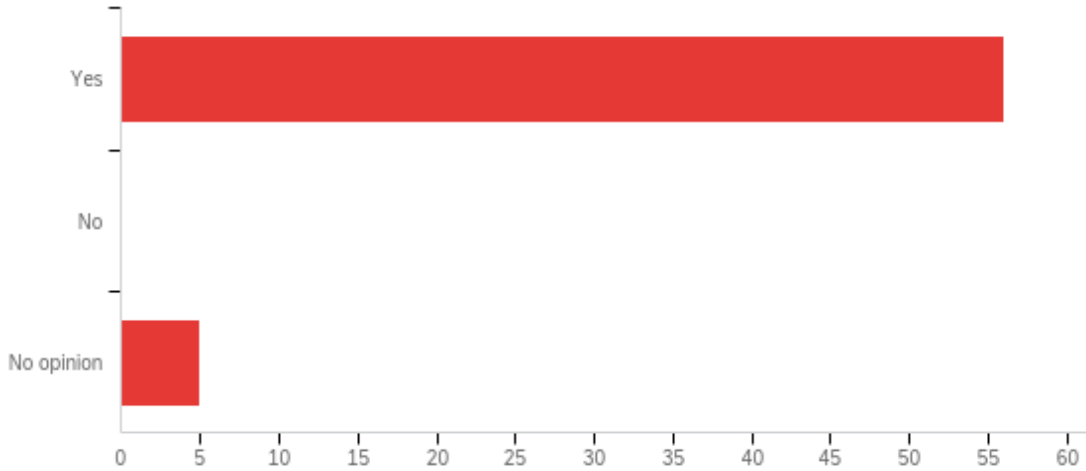


Table 16: Results show 56 participants for ‘yes’, 0 participants for ‘no’, and 5 participants for ‘no opinion’.

Table 17: What type of program would you like to see UNL use to encourage students to reduce their use of single-use plastic bags?

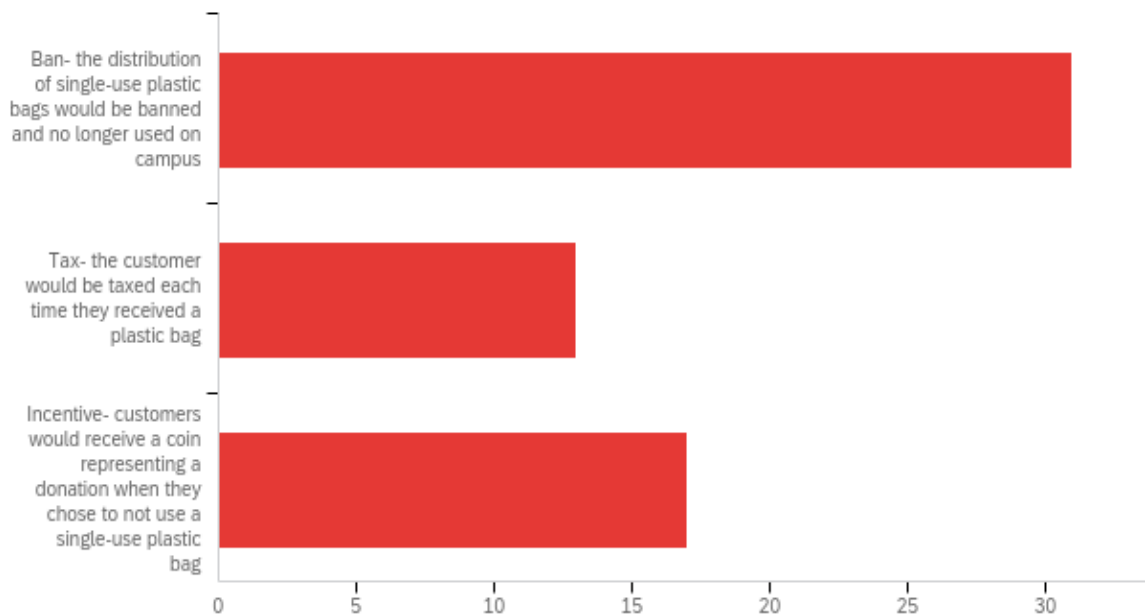


Table 17: A majority of respondents answered 31 for ban, 17 for incentive, and 13 for tax.

Table 18: It would be an easy task for me to participate in the EcoCoin program. EcoCoin is an incentive-based program where the customer receives a coin to put in a donation bin when they refuse a single-use plastic bag. The donation goes to one of three campus organizations who promote sustainability’.

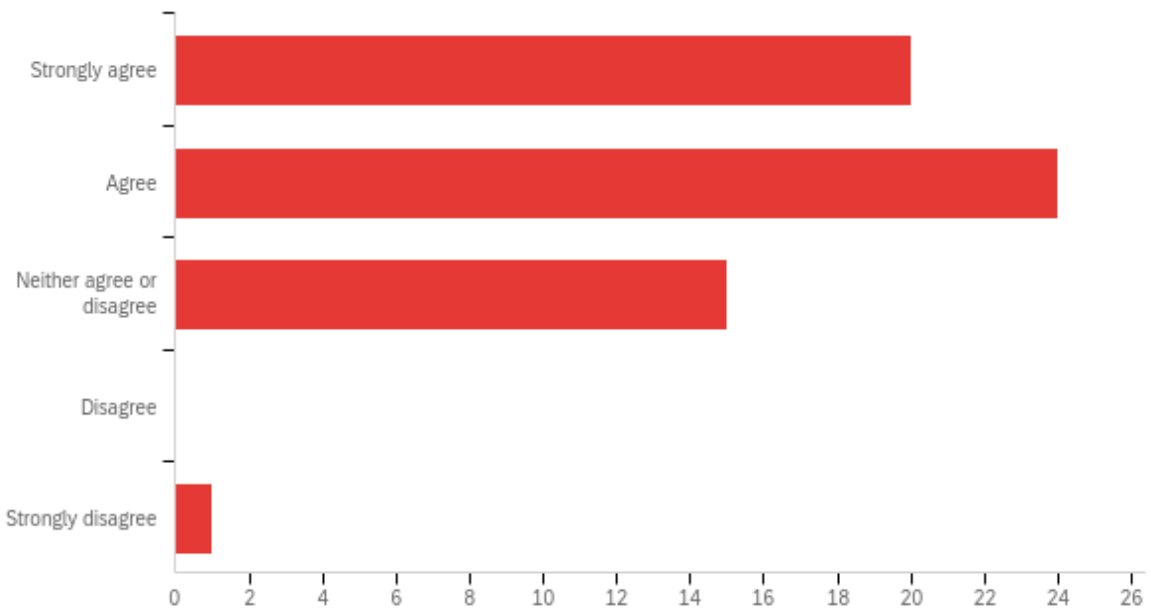


Table 18: A majority of responses stated that they agree (24 participants), followed by strongly agree (20 participants), neither agree or disagree (15 participants), strongly disagree (1 participant), and disagree (0 participants).

Table 19: Participating in EcoCoin would take too much time'

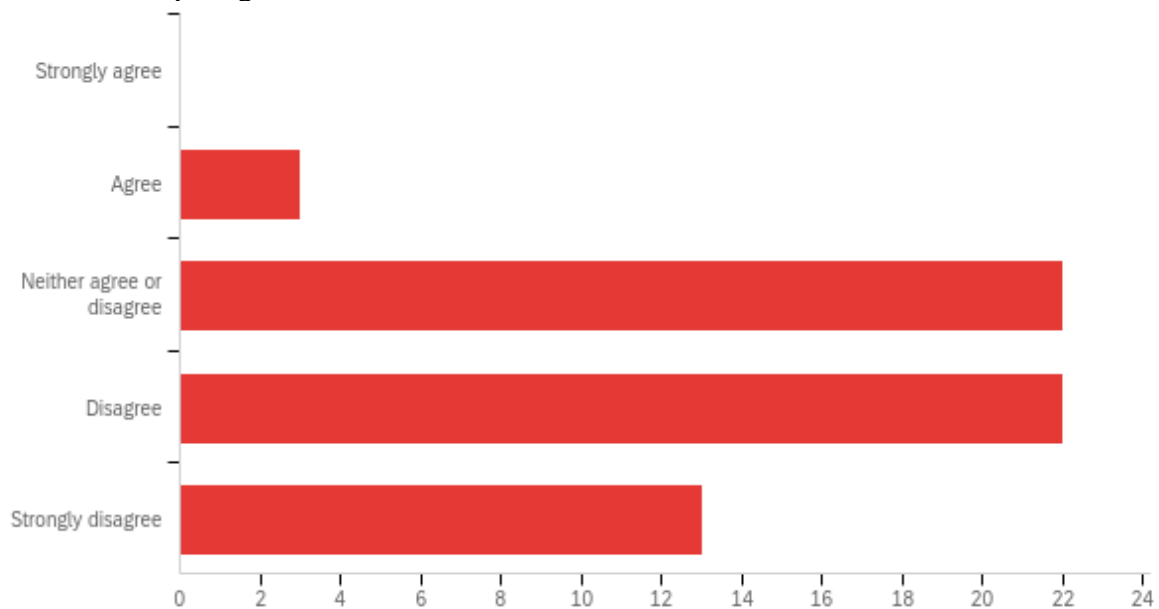


Table 19: Results are 22 participants for both disagree and neither agree or disagree, 13 participants for strongly disagree, and 3 participants for agree.

Table 20: For me to reduce my use of single-use plastic bags would be ...

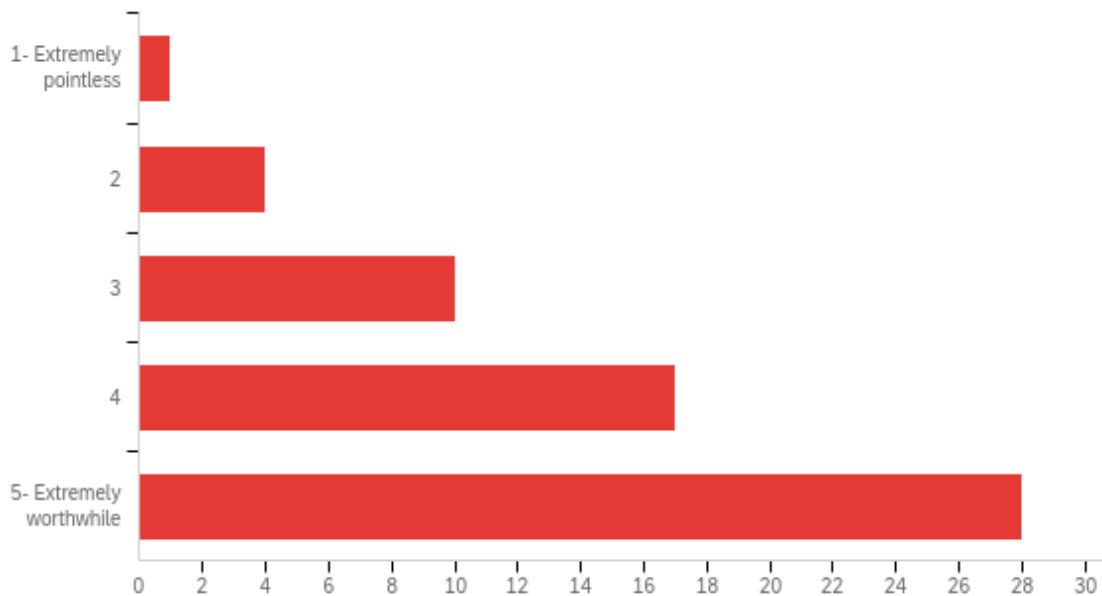


Table 20: The majority stated that it would be 5-extremely worthwhile (28 participants), 4 (17 participants), 3 (10 participants), 2 (4 participants), and 1-extremely pointless (1 participant).

Discussion and Recommendations

The data provided by this survey can help inform the University of Nebraska-Lincoln on how to improve policy and practices to reduce the distribution of single-use plastic bags on campus. The measures suggested and described here are necessary to reduce the amount of waste produced by the university, meet sustainability goals, and reduce contribution to plastic pollution.

With the use of the Theory of Planned Behavior and the survey questions about attitude, perceived behavioral control, and subjective norm we can understand students' single-use plastic bag behaviors on campus. The survey included four questions about attitude. The first being reducing the use of single-use plastic bags does not make a difference. A majority of respondents strongly disagreed or disagreed with this statement. The second attitude question had a positive framework. The question was I regularly think about how my actions affect the planet Earth. The results for this statement were a majority strongly agreed or agreed. A second positively worded question was consuming environmentally friendly products has important and direct benefits to the environment. Once again with the positively worded question the majority of respondents strongly agreed or agreed with this statement. The last attitude question was do you view single-use plastic bags as a source of pollution. A majority of respondents strongly agreed or agreed that single-use plastic bags are a source of pollution. Having used both positively and negatively worded questions, the results show that attitude is an influencing factor of university students' single-use plastic bag behavior.

The first subjective norm question respondents were asked is I feel social pressure from my peers to reduce my use of single-use plastic bags. The results for this question were disagree and neither agree or disagree. The second social norm question was people who are important to

me want me to reduce my use of single-use plastic bags. The majority of respondents answered neither agree or disagree to this question. The second most common answer was agree. The third subjective norm question was I don't see others not using single-use plastic bags, so I continue to use them. A majority of respondents answered disagree with neither agree nor disagree being the second most common answer. The data collected from these questions suggests that subjective norm is not an influencing factor of whether or not students use single-use plastic bags on campus.

The survey included four perceived behavioral control questions. The first being it would be an easy task for me to not use single-use plastic bags on campus. A majority of respondents strongly agreed with this statement. The second question was not using single-use plastic bags on campus takes too much time. A majority strongly disagreed or disagreed. The third perceived behavioral control question was it would be an easy task for me to participate in the EcoCoin program. A majority of student respondents agreed or strongly agreed. The fourth and final perceived behavioral control question was participating in EcoCoin would take too much time. There were an equal number of responses for disagree and neither agree nor disagree. The results show that a majority of students would support and participate in an incentive-based program like EcoCoin in an effort to reduce their use of single-use plastic bags on campus. The results also suggest that perceived behavioral control is an influencing of university students' single-use plastic bags behaviors.

When asked if they intend to reduce their use of single-use plastic bags a majority of student respondents strongly agreed or agreed. With this piece of information, the university needs to provide the means and resources for students to do so. The finding relates to the idea that attitude does not always translate to behavior. To gain an understanding of how the

university could meet this need and provide students with the resources to translate their attitude to behavior it was asked I would use less single-use plastic bags if... The top three responses were if alternative bags were more accessible, there was an established norm to not use single-use plastic bags on campus, and if UNL placed a ban on the distribution of single-use plastic bags. One way to make alternative bags more accessible to students is to provide them with a cloth reusable shopping bag during freshman orientation. A study on recycling behaviors found that even if a person did not have an attitude that promoted environmental behavior they still participated in these actions because they had convenient access to a recycling program (Derksen & Gartrell, 1993). As, mentioned in the introduction, UNL has a goal of creating campus culture that strives for zero-waste and sustainability. For it to become a common practice to not use single-use plastic bags on campus, the university needs to provide students with the resources to do so. This could mean having available alternatives or placing a ban on single-use plastic bags. The University of Nebraska-Lincoln successfully banned Styrofoam from its campuses and the same could be done for single-use plastic bags. With more work it could be done.

A finding from the survey is that restaurants and the UNL bookstore are the main ways in which students use single-use plastic bags. Knowing that these are the two main sources gives the university the knowledge to know where to focus their efforts in reducing the distribution of single-use plastic bags. Recommendations for EcoCoin is to switch the locations of the program from the initial Herbie's Market to restaurants and the bookstore.

While in the process of transitioning from distributing single-use plastic bags to the eventual goal of no single-use plastic bags, UNL could provide a drop-off bin for recycling single-use plastic bags. A majority of participants indicated that when they do receive a single-use plastic bag they store them for recycling or reuse. Having a location on campus to recycle

single-use plastic bags would promote the proper disposal and recycling of single-plastic bags for those who continue to use them. The suggested location for the recycling bin is in the Nebraska Union as this is where the bookstore and restaurants are located.

The survey results show that a majority of the respondents feel that a ban on single-use plastic bags is the best program for UNL to use to encourage students to reduce their use of single-use plastic bags. This finding corroborates the initial ASUN survey results of 66% of students in support of banning single-use plastic bags on campus. This shows that even three years later students still have the same attitude towards wanting a more sustainable campus. It is interesting that a ban was the most favored choice as it can be seen as the most extreme method. A majority of respondents also answered that UNL should encourage students to reduce their use of single-use plastic bags on campus. This indicates that students want to see the university take an initiative to make this change.

As mentioned in the introduction on plastic use, single-use plastic bags are mainly used because they are convenient and readily available. A majority of survey participants answered that they do not feel like single-use plastic bags are a necessary part of their shopping experience. Two things can be said about this result. One is that single-use plastic bags are still being used out of convenience even though they are not viewed as necessary and two respondents recognize that there are other more sustainable options that they could use instead.

Even though a majority of the student participants in the survey were seniors they still indicated that they want to see sustainable changes to be made to UNL's campus.

A majority of respondents indicated that they would participate in an incentive-based program like EcoCoin. They also indicated that it would not take too much time to participate in the program when shopping at Herbie's Market, restaurants, and the bookstore. With these

results it can be said that EcoCoin is one method that can be used to reduce the use of single-use plastic bags on UNL's campus.

The university can use an educational approach to promote participation in the EcoCoin program. Social media campaigns and posters promoting the program visibly prompt students to participate in EcoCoin. Educational material should include statistics on human consumption of plastic bags, the lifecycle of a plastic bag, the harmful effects plastic has on the environment, recycling options, and suggestions for how one can reduce their use of single-use plastic bags. The recommendation for the university is to implement the EcoCoin incentive program with supporting educational material.

Conclusion

The results of the survey were used to understand how UNL students view single-use plastic bags, how, when, and where they use them, and if they are willing to change their behavior to align with the sustainability efforts of the university. These results come from the one-time Qualtrics survey distributed to UNL students through convenient participation. The question of which Theory of Planned Behavior factors influence students use of single-use plastic bags was concluded to be attitude and perceived-behavioral control (Table 14). The question of EcoCoin's potential to change students behavioral use of single-use plastic bags on campus was not directly answered because the program was not implemented, but the results of the survey indicate that students are willing to participate in the program if implemented (Table 18 and Table 19). The survey results are concluded that students would find it worthwhile to participate in the program in an effort to reduce their use of single-use plastic bags on campus (Table 20). Through reviewing literature and the (Minter, 2015) case study it was found that bans

have been successful at diverting plastic waste from landfills, but then resulted in an increase in reusable bags going to the landfills. This shows that bans can be successful but appropriate education of the reason and method of the ban needs to be taught to those involved in order for it to succeed. Through research it was found that a ban might not be the most effective choice for UNL. This conclusion opposes the results of the UNL students choosing a ban over an incentive-based program or tax. In Minter's 2015 case study of Austin, Texas it was found that a ban successfully reduced the amount of single-use plastic bags being used. If properly implemented and encouraged through educational material bans have shown to be a successful method for reducing the use of single-use plastic bags. In the Homonoff 2018 case study it was found that a 5-cent tax successfully changed customers behavioral use of single-use plastic bags. This study found that a ban and a tax can be successful at reducing single-use plastic bag use. The Theory of Planned Behavior has been used to determine which factors influence student's attitude, subjective norm, and perceived behavioral control for single-use plastic bags. In the studies of understand recycling in Athens, Greece (Ioannou et. Al 2013), household food waste (Graham-Rowe et. Al 2015), household waste sorting (Zhang et. Al 2019), and sustainable food consumption (Vermeir and Verbeke, 2008) a common conclusion is that there was a lack of accessibility to participate in these sustainable actions. Using the recommended location sites for EcoCoin and single-use plastic bag recycling bins should eliminate this obstacle. Recommendations for further study is to determine if a ban on single-use plastic bags is effective at reducing use and plastic waste specifically on university campuses. Something that I would change about this study is the method of distributing the survey. Instead of using convenient participation I would distribute the survey to an elective-based course where the class is made up of a variety of majors and years. I would also aim to have more usable responses. Future work

could determine which of the three types of methods (ban, tax, and incentive) are the most beneficial long-term and which is the most effective in changing behavior. Limitations of this study is that the results cannot be generalized to other universities. Also, the results of a majority agriculture and natural resource majors could have skewed the results (Table 5). The researcher struggled to distribute the survey as a majority of the researcher's courses are environment-based.

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Proposed Budget

Phase	Days	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Content Analysis	4							
Content Collection	5							
Course Analysis	2							
Course Design	2							
Course Writing	5							
Review & Refine	3							

Proposed Budget

Research Student:	Josephine Stoessel
Thesis Title: WILL THE IMPLEMENTATION OF THE ECOCOIN PROGRAM REDUCE THE USE OF SINGLE-USE PLASTIC BAGS ON CAMPUS THROUGH THE CHANGE IN STUDENTS BEHAVIORS?	
Thesis Advisor:	Dr. Prabhakar Shrestha
Thesis Reader:	Anna Oetting

Category	Details	Cost
Stationery (list items)		0
Printing / Copying		0
Postage		0
Equipment (list items)		0
Travel		0
Laboratory Expenses (list details)		0
Other (list details)		0
Total Amount Sought		\$0.00
Amount Approved by Environmental Studies Director		\$0.00
Signature of Director:		