Sustainability Perspectives Among Montana State University Billings Students

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Abstract

The Honors Inquiry and Research class at Montana State University Billings set out to conduct a survey about sustainability amongst their fellow peers. The goal of this survey was to determine the knowledge and efficacy of students and to see if there were any trends or developments. Some of the trends examined were between political parties, knowledge and efficacy relationship, and gender. It was determined that Democrats were significantly more worried about climate change than over the Republicans and as an overall group they cared and knew more about sustainability. The next trend of if a higher knowledge means a higher efficacy was also proven correct. On average if you knew more about sustainability you also cared more. The next major category was gender trends between males and females. It was shown that not one gender knew more about sustainability. The knowledge data came out pretty evenly making it difficult to decipher if there was a true lead. However, when it came to caring about sustainability there was a significant difference. Women cared way more about sustainability and sustainability issues than men. There were several "ones" given by the men about caring, the lowest number, and the women barely had any. These trends gave a perspective about what the next generation feels about sustainability.

Keywords

- Sustainability trends
- Sustainability at college
- Montana sustainability
- Gender sustainability
- Political sustainability
- Developments in sustainability

Introduction

Sustainability in our world today is a prime topic for discussion. When we think about the future of our planet, we have to look at how the next generation feels and what they know about sustainability. By surveying college students at Montana State University Billings about their knowledge and efficacy concerning sustainability we can begin to get an idea of this. By asking survey questions that are concerned with ideas like energy, water, recycling, and waste management we can further investigate any patterns. Looking into these concepts allows us to see the new trends and developments that are occurring in the area of higher education.

Investigating the next generation of adults allows us to examine ideas like what is most important to them, are schools doing a good enough job on educating about sustainability, and more trend-based ideas like do gender and political affiliation have anything to do with a person's answers. Sustainability developments and trends are important topics of discussion and are going to be very important when it comes to the future of the planet that we call home.

Review of Literature

People often think that the idea of sustainability is too far out of reach or that it is too expensive to make it worth much effort. However, it seems sustainability is often misunderstood and there are many ways we can help to improve the sustainability of our society. Terms like "climate change" and "sustainability" may seem like recent "buzz words", but these ideas and concepts have been around for years. In comparison to the United States, the rest of the world seems to be moving forward in their improvements where we appear to be taking steps backwards. Finding unique alternatives and realizing that even small changes make a difference will be what greatly helps improve this nation for us and for future generations.

It is useful to begin by defining sustainability. Jenkins defines sustainability as "a capacity to maintain some entity, outcome, or process over time," and he explains, "the concept of sustainability frames the ways in which environment problems jeopardize the conditions of healthy economic, ecological, and social systems" (2016). This idea of sustainability "jeopardizing" systems is somewhat commonly held and is arguably the most important and controversial issue surrounding sustainability efforts. Jenkins further explains how political controversies can also contribute to the status of sustainability. The three pillars of sustainability are economic, environmental, and social (Beattie 2019). These three pillars help us to identify the major hurdles and topics that are needed to overcome the concept of sustainability.

Even though sustainability seems as if it is a fairly new topic it has actually been a discussion for decades, especially around the world. London and Barcelona are world leaders in that they are using new technologies to improve efficiencies in transportation and other services (Adler 2020). Technology has also been recognized by others as a major factor in the improvement of sustainability. Companies using technology to improve their machinery and

work facilities is a newer development that has a lot of promise to help change the game with sustainability (Saunila 2019). The advancements however are not limited to the tools used in production. A new concept of using WIFI to regulate room temperature shows great potential. The WIFI was able to regulate more efficiently than other temperature control keeping the waste of electricity down and decreasing the amount of power making it more sustainable (Ouf 2017).

When thinking about sustainability, there is a tendency to focus on only one thing; the overall perspective can be overwhelming. Yet, we should not lose sight of the fact that little bit of change in the right direction can make a big difference. One such example is in the case of biodiesel. In recent years, biodiesel has come a long way, especially when it comes to biodiesel that is made from algae. Algae biodiesel is made in cultures and absorbs CO2 from the air which helps to improve the atmospheric quality (Medipally 2015). Unfortunately, the extraction process is tedious which contributes to the higher production cost (Medipally 2015). Light, temperature, and nutrients are all important factors in growing algae and they are also some of the most limiting factors (Khan 2018).

Social Sciences Approaches to Sustainability

Among social scientists, many investigate how knowledge, beliefs, and actions are related when addressing sustainability. For instance, it has been shown that some individuals are not aware of information that is considered critical to understanding why sustainability is an important agenda in this century (Zwickle et al. 2014). Other work examines dynamics of personal efficacy, understandings that personal actions can "make a difference." Efficacy can then be related to sustainable behaviors (Dunlap et al. 2000). Dewater and Powers (2008) found that people are generally honest in reporting the degree to which they seek information about sustainability. Additional works have measured perceptions of risk (Howe et al. 2015) and personal habits (Markle 2013) as important sustainability factors.

Gender has been shown to be a factor in how much someone particularly cares and/or knows about sustainability. Since gender influences factors such as social status, jobs, and life experiences it also impacts how someone views sustainability (Manandhar 2018).

It has been shown that people with strong internal fatalism are likely to believe they are in charge of their own destiny, whereas people with strong external fatalism are more likely to ascribe their successes and failures to forces beyond their control, often a "fate controlled by God" (Esperaza, Wiebe and Quinonos 2015). It may be that internal and external fatalism play a role in defining how individuals think about personal efficacy as a dynamic in valuing long-term sustainability.

Exploring the difference in opinions and values of the different genders is a very applicable and important concept. It has been traditionally shown that women have a tendency to be more sustainable. This concept goes back to previous times in history where women were

found to be better at conserving resources (Meinzen-Dick 2014). It is interesting to explore if this theme still holds true. Since there is such a divide between men and women it is fascinating to see if there is a significant difference between the two and how that relates to our lives, not just on college campuses.

The literature suggests that the following Research Questions are worthy of asking. For RQ1-4, the project hypotheses are also listed:

- RQ #1: Are self-described Democrats more worried about climate change than self-described Republicans?
    - H1: Democrats are more concerned than Republicans about climate change.
- RQ #2: Does greater critical sustainability knowledge correlate with greater personal efficacy?
    - H2: Greater critical knowledge about sustainability correlates with greater personal efficacy.
- RQ #3: Does gender affect how much a person knows about sustainability?
    - H3: Females will know and care more about sustainability than males do.
- RQ #4: Does gender affect how much a person cares about sustainability and/or sustainability issues?
    - H4: Females will care more about sustainability than males will.

The project also explores the degree to which people connect their lives to the lives of future generations

- RQ #5: In what ways do people connect their "philosophies of life" to the needs of future generations?

Methods

This study will employ two standard social science research methods. It is accepted that when Likert-styled five- or seven-optioned surveys offer respondents middle, as well as polar options, the quality of the data generated is both reliable and valid as measures of human beliefs, attitudes, and even behaviors (Wang and Krosnick 2019). As a beginning, many of the items on the proposed survey provide respondents a five-point scale, ranging from Strongly Agree to Strongly Disagree. Our survey items follow from several published works (Dewaters and Powers 2008; Dunlap et al. 2000; Esperaza, Wiebe and Quinonos 2015; Howe et al. 2015; Markle 2013;

and Zwickle et al. 2014). These previous works allow this project to proceed with confidence in the validity and reliability of the quantitative items. RQ1-4 will be investigated in this manner.

Also, the survey will employ one qualitative question that follows the prescriptions of McCracken (1988). This item will give the respondents the chance to describe their thoughts about sustainability in their own words. The value of an open-ended question is that the respondent has the opportunity to explain important thoughts that are otherwise missed by the quantitative items. RQ5 will be investigated in this manner.

The group we are focusing on for this research project is MSU Billings students (former and current). This group is very interesting for many reasons. The first reason is it can let us know how much the upcoming generations know about sustainability. Our generation of college students is the next generation that is going to have to deal with sustainability issues that plague our world and we should know how much they know. With the focus being on MSU Billings we can evaluate what the college should teach their students so they can leave being more educated. Having these numbers can help to improve the college community and help improve the world around us. Since MSU Billings students live in the Yellowstone River Valley it is relevant to see how much they know in relation to where they live.

The survey we will be conducting is divided into three main parts. The very beginning of the survey is about demographics. Here we will note information like gender, race, and what year you are in school. The first part is multiple choice questions about sustainability. The second part is questions that are based on a scale. The scale is one to five, one being strongly disagree and five being strongly agree. The third part of the survey is open response questions about what they do in their lives that deal with sustainability. At the end of the survey is one final open response question about your philosophy on living life and how it impacts the future generations.

I will recruit five students to participate in this survey. I will go about this by first asking the people I have met and know well if they would like to participate in the survey. These students are people who live in the dorms with me, people in my classes, and people in the Student Activities Board with me. I will then ask if they know of anyone I could ask to participate. If I am still needing or wanting more participants, I will proceed to ask people I see if they would be willing to participate in the phone interview.

The identity of the participants will be protected. I will protect their identity by giving fake names to the participants. This will ensure that no one else except myself knows who they are. I will not discuss details of the surveys with people who are outside of the research project. I will make sure to tell the participants how I will protect their identity and what will be done with the information to make sure that they understand the process of confidentiality.

Findings

Research Question 1

• *Are self-described Democrats more worried about climate change than self-described Republicans?*

When looking at averages it is made apparent the differences that can be found between groups of people. This technique is helpful when you are analyzing a large group of people. You can divide the people into groups and then look at the average of how everyone feels about a certain topic. This makes comparing a lot of diverse answers easier.

Table 1. Comparing Political Affiliation and Worry Over Climate Change	
Political Affiliation	Average Score on Item #23
# of Democrats: 2	5
# of Republicans: 6	1.5
# of Others: 0	0

As we can see by the chart above there is an apparent difference. The chart above shows the average scores of Democrats, Republicans, and others on a scale of 1 to 5 (one being the least, five being the most) when it comes to worrying about climate change. Democrats had an average score of the maximum five and Republicans came out with an average score of 1.5. One way that this analysis could be considered insufficient is because averages exclude the exceptions to "rule." When you see the average, you assume that every Republican does not care about climate change which may not necessarily be true. Despite this possible insufficiency, this analysis supports the hypotheses that Democrats are more concerned about climate change than Republicans are.

Research Question 2

• *Does greater critical sustainability knowledge correlate with greater personal efficacy?*

	Participant Identifier							
	A	B	C	D	E	F	G	H
Item #8 [4]	1	1	1	0	0	1	1	1
Item #9 [2]	1	0	0	0	0	0	0	0
Item #10 [2]	0	0	0	1	1	0	0	0
Item #11 [3]	0	1	0	1	0	0	1	1
Item #12 [4]	1	1	0	1	0	1	1	1
Item #13 [3]	0	1	0	1	1	1	1	1
Item #14 [1]	1	1	1	1	1	1	0	0
Item #15 [2]	1	1	0	1	1	1	1	1
Participant Knowledge Score as a sum (0-8)	5	6	2	6	4	5	5	5

	Participant Identifier							
	A	B	C	D	E	F	G	H
Item 16 [1-5]	2	4	2	2	3	4	4	5
Item 17 [1-5]	3	4	5	4	4	5	1	1
Participant Efficacy Score as a Sum [2-10]	5	8	7	6	7	9	5	6

Table 2. Comparing Critical Knowledge and Efficacy

	Participant Identifier							
	A	B	C	D	E	F	G	H
Participant Knowledge (0-8)	5	6	2	6	4	5	5	5
Participant Score as Sum of 2 Efficacy Items (2-10)	5	8	7	6	7	9	5	6

The charts above demonstrate if there is any relationship between knowledge about sustainability and efficacy. The data above proves the hypothesis that a greater knowledge of sustainability means you care more about it. I say this because in the data five out of the eight participants showed that a higher knowledge correlated to a higher efficacy score. Even though there were some of the participants that did not follow this trend, the overall results show that there is a relationship between the two.

Research Question 3

• *Does gender affect how much a person knows about sustainability?*

	Participant Identifier							
	A	B	C	D	E	F	G	H
Gender [1-5]	2	2	2	2	2	2	1	1
Participant Knowledge (0-8)	5	6	2	6	4	5	5	5

The information given in the chart above disproves the hypothesis that females know more about sustainability than males. This is because there appears to be no significant relationship between gender and the knowledge on the topics. There were women that scored lower than the men and there were women that scored higher. Some of the data does align with the hypothesis, but there is not enough to prove the hypothesis correct. As a whole the data is too inconsistent to show any proper correlation and because of this there appears to be no relationship between gender and intelligence on the issue of sustainability.

Research Question 4

• *Does gender affect how much a person cares about sustainability and/or sustainability issues?*

	Participant Identifier							
	A	B	C	D	E	F	G	H
Gender [1-3]	2	2	2	2	2	2	1	1
Item 17 [1-5]	3	4	5	4	4	5	1	1
Item 18 [1-5]	2	4	4	4	2	5	1	3
Item 19 [1-5]	3	5	3	5	3	3	3	2
Item 23 [1-5]	1	3	5	2	1	5	1	1

The hypothesis that women care more about sustainability and/or sustainability issues than men is proven correct in the data chart given above. When you compare the numbers on the 1 to 5 scale (one being caring the least and five being caring the most) you will see significant differences between the two genders. For example, you will see way more ones on the male side than the female and there is nothing above a three given on the male side. Out of the six females there are only two ones given on the entire side and seven fives given. The prediction for research question five is heavily supported by the data that was obtained during the survey.

Research Question 5

• *In what ways do people connect their "philosophies of life" to the needs of future generations?*

- Future Generations
    - So future generations can enjoy what I have enjoyed.
    - So future generations won't have to deal with the problems that we create.
    - They will have to deal with whatever we do.
    - Be an example to future generations about how they should live.
    - We live based off of History and the future generations will do the same.
- Environment
    - Do your best to limit negative effects on the environment.
    - Respect the Earth and what we have been given.

The average consensus of my research was that everyone wants to make sure that the future generations can enjoy what we have enjoyed and that they will not have to deal with the problems that we have caused. Do this by taking care of the environment. You do not have to be perfect, just try to do your best and make a difference.

Discussion

When looking at sustainability of our planet we need to look at the values, knowledge, and overall feelings of the people, in particular the next generation. Across college campuses the conversation of sustainability is an important one. Here at the Montana State University Campus, we decided to test the knowledge and efficacy of current and former students through a survey. There are many different areas of sustainability that come into play this includes but is not limited to energy, water, recycling, and waste management.

This survey allowed us to take a look into how college students really feel and think about sustainability and if there are in fact any connections within the data. In this survey we asked questions that dealt with energy like do you turn off the lights when leaving a room and do you turn off your television when you walk away from it. With water you got a sense from asking students if they limit their time in the shower to conserve water or if they wash their dishes and clothes with full loads. A limitation in this survey is we did not place a primary focus on details like recycling and waste management, but we can make connections based on what participants said in other categories. For example, if they said that they cared about sustainability and if they were active in taking short showers.

Another limitation could be that we did not have a completely equal group for comparison. This means we lacked even data from male and females and from political parties.

Having more even numbers in these categories would make the comparison part of the survey significantly easier.

Despite these limitations, this survey still gives us a good look at sustainability of college students at MSU Billings. This gets the conversation rolling about what the campus itself could do specifically to educate students and how it compares to other universities across the state of Montana and even the country. We can get a look at what the next generation deems as important and how much they know about sustainability.

Conclusion

Sustainability among college students is a prime place to get a glimpse at what people think and know when it comes to sustainability. When examining a research survey, you think about what it all means and the next steps that will be taken. This survey and data are just the beginning. From here there are some steps and options that could be followed. The first would be conducting this survey to more students at Montana State University Billings to get an even better idea of what students know and feel. This could be done to give the university even more information about how they can improve education and how students can help to make the campus itself more sustainable. The next large-scale step would be conducting this survey at other college campuses in Montana and across the country. This could not only compare the knowledge and efficacy of different colleges and states, but could be used to give an even more detailed perspective of the next generation. Another option could be adding more survey questions. You could add more questions of different varieties and topics to get an even better sense of a person and their beliefs. Sustainability will forever be a concept that is changing and growing. We need to keep looking at data like this to keep our society up to date and to keep moving forward.

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