

An Examination of University Employees' Green Workplace Behaviors

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Degree

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ABSTRACT

As colleges and universities implement or enhance campus sustainability programs and administrators seek to understand the impact of such programs on their campuses, much effort has focused on understanding the green behavior of students enrolled at these institutions. However, given that universities employ large numbers of faculty and staff, it is also important to understand employees' green behaviors. This descriptive survey research study sought to better understand the green behaviors of employees at a research university in the southeastern part of the United States. Potential participants were emailed a link to an online Qualtrics survey consisting of 31 closed and open-ended questions at the beginning of the fall 2022 semester. The final sample included 397 employees, including 119 faculty and 278 staff. In addition to descriptive statistics, inferential statistics were conducted to look for differences between select demographic groups, including employees' primary role on campus (staff or faculty), length of employment at the university, gender, generational status, and political beliefs. Results show a statistically significant relationship exists between all five of these demographic variables and employees' awareness of and participation in specific campus sustainability initiatives. For example, staff and women are more aware of the Office of Sustainability, and employees who have been at the university for more than 10 years are more likely to be aware of the Campus Sustainability Master Plan. A statistically significant relationship exists between employees' motivation to participate in green workplace behaviors and their gender, generational status, and political beliefs. Additionally, a statistically significant relationship exists among three barriers (lack of information, lack of time, inconvenience) to recycling and composting and employees' length of employment at the university, generational status, and political beliefs. The findings from

this study provide implications for the university's environmental education outreach initiatives. This study also highlights potential motivators for getting employees to engage in green behaviors at work and barriers that are negatively impacting employees' participation in green workplace behaviors.

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CHAPTER 1: INTRODUCTION

This first chapter examines why universities should seek to understand the extent that their employees are engaging in green behaviors while at work and introduces a descriptive survey research approach to learning more about one university's employees' awareness of and participation in campus sustainability initiatives, motivation to participate in green behaviors, and barriers to participating in such behaviors while at work. This chapter will address the following: 1) statement of the problem, 2) purpose of the study, 3) theoretical frameworks guiding the study, 4) significance of the study, 5) research questions, 6) key terms and definitions, and 7) assumptions, limitations, and delimitations.

Statement of the Problem

According to the Environmental Protection Agency (EPA), the United States (U.S) generates 258 million tons of landfill waste each year, and only 34.6% of that waste gets recycled. In 2018, Musulin reported that by 2021, the US would only have about 15 years remaining of landfill capacity. As we run out of landfill space, the need for reducing, reusing, and recycling is more important than ever. Organizations are increasingly feeling pressured to comply with new environmental regulations and reduce their negative environmental impact (Temminck, Mearns, & Fruhen, 2015). Not only do universities consume large quantities of energy and water, but they also generate significant volumes of solid waste (Stafford, 2010). To address the looming environmental disaster due to diminishing landfill capacities worldwide, colleges and universities must take part in, if not lead, environmentally friendly initiatives to help reduce waste. As a result, institutions face significant pressure to adopt sustainable practices (Stafford, 2010). This may mean creating a sustainability program or enhancing the one already in place. However, even with

sustainability programs in place, many individuals still choose not to participate in such initiatives.

As colleges and universities implement or grow their sustainability programs and administrators seek to understand the impact of these programs on their campuses, much of the effort has focused on understanding the green behavior of students enrolled at these institutions, rather than the employees (faculty and staff). According to Fine (2002), “higher educational strategies for advancing sustainability need to be developed by individual systems and institutions so that they can remain locally relevant and culturally appropriate (p. 252).” The active participation of employees is one of the main factors influencing the successful integration of environmental standards and policies (Boiral, 2003, 2007; Christmann & Taylor, 2006). Without employee participation, especially at institutions that employ thousands, the negative environmental impact will only exacerbate.

Purpose of the Study

While the literature on employee green behaviors in the workplace has grown in recent years (Francoeur et al., 2021), most of it has focused on the corporate world as the organizational setting. There has been scant research on employee green behaviors with the university as the organizational setting. In addition, research related to sustainability in higher education has focused mostly on students’ attitudes, beliefs, and behaviors (Emanuel & Adams, 2011; Smythe et al., 2010; Hansen et al., 2008), rather than those of non-student university employees. Additionally, there is little to no research on this topic at large universities in the southeastern part of the United States (U.S). Therefore, to address this gap in the literature, the purpose of this descriptive survey research study is to gain a better understanding of employees’ green behaviors at a Carnegie Research R1 Doctoral University

(R1 University) in the southeastern part of the U.S. This study also seeks to better understand university employees' awareness of and participation in campus sustainability initiatives, what motivates them to engage in green behaviors while at work, and to identify any barriers that prohibit university employees from engaging in green workplace behaviors.

Theoretical Frameworks

A combination of two theoretical frameworks guides this study: self-determination theory and systems thinking. Self-determination theory is a theory of motivation (Ryan & Deci, 2017) that suggests all humans have three basic psychological needs that underlie growth and development: autonomy, competence, and relatedness (Ryan & Deci, 2017). Autonomy is the feeling one has choice and is willingly endorsing one's behavior. Competence is the experience of mastery and being effective in ones' activity. Needing to feel connected and a sense of belongingness with others is relatedness. According to self-determination theory, our social environment, including family, friends, co-workers, culture, etc., can either promote or get in the way of having these psychological needs met. Evidence suggests that people are more autonomous in their behaviors and more likely to persist when these needs are met (Ryan & Deci, 2017).

According to Stroh (2015), systems thinking is the ability to understand the interconnections of a system in a way that a desired purpose can be achieved (e.g., reducing waste on campus). This approach is especially useful in addressing complex problems that often involve creating organizational change. As described by Lezak and Thibodeau (2016), the main emphasis of systems thinking is "causes and their effects are often less straightforward than one might intuitively expect" (p. 144). This mindset helps facilitate the understanding of systems and events as emerging from many interrelated factors, leading to

expected and unexpected consequences (Meadows, 2008). Information is crucial to systems thinking; it holds systems together and plays a major role in determining how they operate (Meadows, 2008).

Significance of Study

Understanding why individuals engage in green behaviors are of interest to environmental education researchers and those responsible for implementing sustainability initiatives or programs in their community. Having a better understanding of what motivates individuals and identifying any barriers to environmental stewardship can shed light on what organizations can do to mitigate their overall environmental impact. In addition, universities are increasingly incorporating environmental sustainability goals into their campus master plans. For instance, the university in this study has committed to increasing their campus waste diversion rate to 50% by 2030. They also have goals of reducing campus energy and water consumption. The university will need employees' help to reach these goals.

In addition, university employees are also in a position of modeling appropriate green behaviors to students, especially faculty and staff that work directly with students on a regular basis. Previous research on learning in higher education emphasizes the importance of appropriate role models in teaching affective outcomes (Gagne, 1985), and that poor role models can lead to students acquiring the wrong values (Paice et al., 2002). In other words, faculty and staff can help teach students ideal green behaviors by participating in these activities themselves while in the presence of students (or incorporating into the curriculum or meetings, if applicable) and they can also teach them non-green behaviors (e.g., throwing single-use plastic bottles into the trash instead of recycling bins). Research by Higgs and

McMillan (2006) found that modeling is a valuable approach to sustainability education, because it promotes both learning about sustainability and the adoption of sustainable behaviors in schools. If university employees model green behaviors at work, hopefully it will result in an increase of students also engaging in these behaviors, thus increasing the likelihood the campus can meet its overall sustainability goals.

Furthermore, a more complete understanding of the factors that drive campus sustainability is essential for crafting effective policy (Stafford, 2010). Such policy will increase the effectiveness of campus groups (e.g., Office of Sustainability, Committee on the Campus Environment) that are trying to promote campus sustainability. As stated by Ones and Dilchert (2012), “embedding environmental sustainability into the organizational DNA requires workforce involvement” (p. 115). Therefore, it is imperative that organizations understand the extent that their employees are engaging in green behaviors while at work.

Research Questions

The research questions that guided this descriptive survey research study included:

- 1) To what extent are university employees aware of campus sustainability initiatives?
- 2) To what extent do university employees participate in campus sustainability initiatives?
- 3) What motivates university employees to engage in green behaviors while at work?
- 4) What barriers exist that prohibit university employees from engaging in green behaviors at work?

Key Terms and Definitions

The following is a list of key terms and their definitions used throughout this study:

- 1) Green behaviors – “actions and behaviors that employees engage in that are linked with and contribute to environmental sustainability” (Ones & Dilchert, 2012, p. 87).
- 2) Pro-environmental behavior – “behavior that consciously seeks to minimize the negative impact of one’s action on the natural and built world (e.g., minimize resource and energy consumption, use of non-toxic substances, reduce waste production)” (Kollmuss & Agyeman, 2002, p. 240).
- 3) Environmental sustainability or sustainability – the principle that “everything we need for our survival and well-being depends, either directly or indirectly, on our natural environment” (EPA, n.d.).
- 4) Environmental Stewardship – “the responsible use and protection of natural environment through conservation and sustainable practices to enhance ecosystem resilience and human well-being” (National Oceanic and Atmospheric Administration, n.d.).
- 5) R1 Doctoral University – a classification for doctoral universities with very high research activity. Doctoral universities are institutions that award at least 20 research/scholarship doctoral degrees yearly and has at least \$5 million in total research expenditures (Carnegie Classification of Institutions of Higher Education, n.d.).
- 6) Self-Determination Theory – theory of motivation that people tend to be driven by a need to grow and gain fulfillment and that one’s tendency to engage in proactive or

passive behavior is largely influenced by the social conditions in which they were raised (Deci & Ryan, 1986; Gagne' & Ryan, 2005).

- 7) Systems - an interconnected set of elements that is coherently organized in a way that achieves something (Meadows, 2008).
- 8) Systems Thinking- the ability to understand the interconnections of a system in such a way as to achieve a desired purpose (Stroh, 2015).

Assumptions, Delimitations, and Limitations

Assumptions

It is assumed that this study's sample will be representative of the university's faculty and staff population. It is also assumed that responses will accurately reflect participants' awareness, participation, motivation, and barriers related to engaging in green workplace behaviors.

Delimitations

This study included only faculty and staff and excluded students. Additionally, data collection for this study took place during a brief window of time: August 2022. This study focused on four facets of green workplace behaviors: awareness, participation, motivation, and barriers.

Limitations

One limitation of this study is related to a common limitation of survey research: the data will lack details or depth that is obtained through qualitative research methods such as interviews or focus groups. However, the survey includes open-ended questions that provides opportunity for participants to provide more detailed feedback. Another potential limitation is sample size, including an unequal distribution among the different types of

participants: faculty and staff. Ideally, to make group comparisons, there will be an equal distribution among faculty and staff respondents. Even though it is assumed that participants will respond honestly, a third limitation is that some participants are likely to instead respond in a socially desirable way.

Chapter Summary

This chapter briefly described the purpose of this descriptive survey research study, which was to learn more about the green behaviors that employees are aware of and are participating in while working at a R1 University in the southeastern U.S., what motivates them to participate in such behaviors, and what barriers, if any, prohibit them from participating. The significance of this study was discussed as well as details about the theoretical frameworks that guided this study. The research questions were presented, along with the study's assumptions, delimitations, and limitations. The next chapter describes key literature on sustainability in higher education, sustainability in the workplace, factors that impact sustainability, and the university as an organization, and how this research intends to fill specific gaps within the body of literature.

CHAPTER 2: LITERATURE REVIEW

The focus of this descriptive survey research study was to investigate the extent to which university employees are aware of and engage in green or sustainable behaviors while at work. The employees in this study were employed at a R1 University in the southeastern U.S. with a student population of over 30,000 undergraduate and graduate students, and approximately 5,000 employees. This chapter offers a review of the literature relating to sustainability in higher education, sustainability in the workplace, universities as organizations, employee awareness of campus sustainability initiatives, motivation to participate (or not participate) in these initiatives, and potential barriers to employee participation in green workplace behaviors. The literature review was conducted by using the Google Scholar search engine and the university library's search engine: OneSearch. Keywords used for initial literature searches included "sustainability in higher education" and "university employees and sustainability." Additional searches focused more on green and pro-environmental workplace behaviors and how to measure them.

The Importance of Sustainability

According to the Environmental Protection Agency (EPA), the U.S. generates 258 million tons of landfill waste each year, and only 34.6% of that waste gets recycled (www.epa.gov). In 2018, Musulin reported that by 2021, the US would only have about 15 years remaining of landfill capacity. As we run out of landfill space, the need for reducing, reusing, and recycling is more important than ever. Organizations are increasingly feeling pressured to comply with new environmental regulations and reduce their negative environmental impact (Temminck, Mearns, & Fruhen, 2015). In British Columbia, Canada, higher education institutions are now held to the same level of environmental accountability

as government and industry (Smythe, Fredeen, & Booth, 2010). While there is no evidence that higher education institutions in the U.S. are held to national environmental accountability standards like those in Canada, federally-funded U.S. colleges and universities are expected to comply with any applicable federal laws, including those that focus on environmental protections. Even though higher education is seen as a state responsibility, federal legislation has had an historic impact on higher education, especially large universities (Glenny & Dalglish, 1973).

Many colleges and universities have made commitments to make their campuses more sustainable as evidenced by the creation of the Higher Education Associations Sustainability Consortium (HEASC) and the Association for the Advancement of Sustainability in Higher Education (AASHE). In 2006, the HEASC issued a call for the AASHE to develop a campus sustainability rating system, which lead to the creating of STARS: The Sustainability Tracking, Assessment & Rating System.¹ Today, over 1,000 U.S. institutions have registered to use the STARS Reporting tool to measure their sustainability performance.²

Not only do universities consume large quantities of energy and water, but they also generate significant volumes of solid waste (Stafford, 2010). To address the looming environmental disaster due to diminishing landfill capacities worldwide, colleges and universities must take part in, if not lead, environmentally friendly initiatives to help reduce waste. As a result, institutions face significant pressure to adopt sustainable practices (Stafford, 2010). This may mean creating a sustainability program or enhancing the one

¹ <https://stars.aashe.org/about-stars/history/>

² <https://stars.aashe.org/about-stars/why-participate/>

already in place. However, even with sustainability programs in place, many individuals still choose not to participate in such initiatives. The reasons why this happens are of interest to researchers in environmental education and those in charge of leading and coordinating sustainability efforts on campus. According to Stafford (2010), a more complete understanding of the factors that drive campus sustainability is essential for crafting effective policy. Such policy will increase the effectiveness of campus groups (i.e., Office of Sustainability, Committee on the Campus Environment) who seek effective ways of promoting campus sustainability.

As colleges and universities implement or grow their sustainability programs and administrators seek to understand the impact of these programs on their campuses, much of the effort has focused on understanding the green behavior of students enrolled at these institutions, rather than the employees (faculty and staff). According to Fine (2002), "higher educational strategies for advancing sustainability need to be developed by individual systems and institutions so that they can remain locally relevant and culturally appropriate (p. 252)." The active participation of employees is one of the main factors influencing the successful integration of environmental standards and policies (Boiral, 2003, 2007; Christmann & Taylor, 2006).

To gain a more comprehensive understanding of the reach and effectiveness of campus sustainability initiatives, universities must also seek to understand employee participation. For example, understanding employees' barriers to being an environmental steward would enable institutions to target interventions to lessen these barriers and increase their employees' motivation to engage in or practice more green behaviors at work.

This study seeks to add to the literature by seeking a better understanding of the green behaviors of university employees at an R1 University. Data collected will be shared with the university's Office of Sustainability and Committee on the Campus Environment so they can establish baseline data on employees' participation in campus sustainability initiatives. This will help identify where additional environmental education and outreach is needed among staff and faculty, and what barriers might impact their participation.

Sustainability in Higher Education

Much of the research on sustainability in higher education "falls into one of four categories: 1) arguments about the need for reform of curriculum and environmental practices in higher education, 2) surveys, summaries, and descriptions of sustainability initiatives in one or more institutions, 3) narrative accounts of the experience of institutional change, or 4) audit reports of the economic and ecological benefits of successful projects and programs (Fine, 2002, p. 244)." In reviewing the literature on sustainability in higher education 20 years later, this continues to be true, however, more recent research tends to focus on students and their participation in waste-reduction initiatives such as recycling (Largo-Wight, et al., 2013; Smythe et al., 2010; Hansen et al., 2008;). Even though the bulk of higher education sustainability research seems to focus on recycling, there has been some research about students' perceptions of sustainability in general. For example, a study by Emanuel & Adams (2011) investigated whether there were differences between college students in Alabama and Hawaii regarding their perceptions of sustainability. Msengi et al., (2019) assessed college students' knowledge and awareness of sustainability issues at a Texas university.

Additionally, recent related research has focused on recycling/waste reduction practices at international universities rather than those in the U.S. For instance, Saldana-Duran & Messina-Fernandez (2021) assessed an electronic waste (e-waste) program on a university campus in Mexico. Another recent study based in the United Kingdom (U.K.) explored students' perceptions of recycling and whether the university's recycling strategy helped or hindered recycling in the residence halls (Dixon & Parker, 2022). And Na'im et al., (2022) investigated recycling rates at four institutions of higher education in Malaysia.

Sustainability in the Workplace

According to Ones and Dilchert (2013), "the study of environmentally-relevant individual behavior has only a brief history in workplace settings" (p.118). Research has shown that employees who engage in voluntary and unrewarded environmental actions that go above and beyond their job requirements in an organizational setting can contribute to a reduced environmental impact of the organization (Temminck, et al., 2015). In addition, work settings that foster employee willingness to engage in environmentally friendly behaviors could significantly influence the likelihood of green actions in the office (Paille & Borail, 2013; Yuriev et al., 2018). Employees are less likely to perform green behaviors when there is a weak pro-environmental atmosphere in an organization (Chou, 2014; Lamm et al., 2015; Ruepert et al., 2016). The environmental performance of organizations depends on the voluntary participation of employees in greening activities (Boiral, et al., 2018).

According to DuBois et al. (2013) "organizations typically begin their environmental sustainability (ES) journey by addressing the 'low-hanging fruit' of installing energy efficient heating/cooling/lighting systems that yield significant cost savings" (p. 186). However, ES cannot be achieved through technology alone, which means employee behaviors are also key

in making an organization more environmentally sustainable. A deep commitment to enduring ES requires changes from the people who are employed by and interact with the organization (Dubois, et al., 2013). Therefore, it is important for organizations to better understand the extent to which their employees are participating in green behaviors while at work. This information is needed to identify where environmental education outreach may be needed, and ultimately promote change in employee behavior and culture at the organization. Without an understanding of employees' green behaviors, it will be impossible to determine if progress is being made towards any strategic goals related to sustainability. As DuBois et al., explained, "successful implantation of organizational ES strategies ultimately depends on the behavior changes from individual employees "(p.186).

While individual green behaviors such as recycling, turning off lights and electric appliances, opting for videoconferences instead of traveling, using public transportation, or drinking from reusable cups might appear to be insignificant, they tend to have a large cumulative influence on the overall environmental performance of an organization (Boiral, 2009; Lamm et al., 2013; Tsai et al., 2016). Green actions performed by employees can be divided into two groups: in-role and extra-role (Ramus & Killmer, 2007). In-role actions constitute an ordinary part of the employee's job. Failure to perform them may invoke penalties (Ones & Dilchert, 2012). Extra-role behaviors are discretionary actions that are "neither required nor formally rewarded" (Ramus & Killmer, 2007, p. 557).

Factors Impacting Sustainability

Three primary factors impacting participation in workplace sustainability efforts are the focus of this study: awareness, motivation, and barriers. Table 1 below includes each of

Table 1: Factors Impacting Sustainability in the Workplace

Factor	Importance	Select Citations
<i>Awareness</i>	A lack of awareness of sustainability initiatives in the workplace prohibits employees from engaging in green behaviors	• Perron, et al. (2006)
<i>Motivation</i>	Intrinsic and extrinsic motivation can determine whether employees engage in green behaviors at work	• Sharpe et al. (2021) • DuBois et al. (2013) • Deci & Ryan (1985); Ryan & Deci (2000)
<i>Barriers</i>	Personal and organizational obstacles or barriers can prohibit employees from engaging in green behaviors at work	• Yuriev et al. (2018) (2020) • Norton et al. (2015)

these factors, their importance, and related citations. Following the table, each factor is discussed in more detail.

Awareness

For employees to engage or participate in green behaviors in the workplace, it is logical to assume they need some basic knowledge or awareness of what sustainability initiatives are in place in order to participate. In fact, managing environmental change within an organization is impossible without employee participation and participation is impossible without understanding (Bernstein, 1992). Thus, an awareness and basic understanding of an organization's environmental sustainability initiatives is an essential first step in increasing employees' participation in green behaviors while at work.

Researchers have argued that an effective strategy for improving environmental performance involves requiring that all employees of an organization 1) be aware of the natural systems and their functioning and 2) understand their effect on business performance (Cohen-Rosenthal, 2000; Hale, 1995). How employees become aware of an organization's environmental sustainability initiatives or practices determines whether they fully embrace them. To ensure employee participation in such practices, organizations must provide some amount of environmental awareness education and training (Milliman & Clair, 1996; Miller, 1996). As cited by Perron et al. (2006), previous research has found that environmental education awareness and training programs provide many benefits for employees including, "a feeling of ownership among employees towards the success of the company; an improved ability to retain qualified employees; the ability to attract high achieving graduates; lower staff turnover; greater job satisfaction; closer employee identification with corporate goals and culture; better motivated staff; and the improved

status that comes with working for a company that shows care for the environment” (p. 554). However, even carefully designed environmental education and awareness training programs may not create the behaviors desired and required for an organization to be considered sustainable (Stern, 1999).

Motivation

Previous research has found that motivation is a primary factor in whether individuals will participate in green behaviors. For example, the more important people find it to protect the environment, the more they engage in a wide range of green behaviors (Geiger et al., 2019, Shultz, et al., 2005; Thøgersen & Olander, 2002). In addition, helping people focus on the environmental reasons for a behavior can encourage them to behave pro-environmentally (Bolderdijk, et al, 2013; Evans et al., 2013; Schwartz et al., 2015; Spence et al., 2014; Steinhorst, et al., 2016). According to DuBois et al., (2013), “the extent and consistency of environmentally-friendly behavior among employees reflect the degree to which employees ‘own’ a personal commitment to environmental sustainability” (p. 192). An effective way to propagate green behavior throughout an organization involves empowering employees on their journey towards self-determined green behavior (DuBois et al., 2013). There are three sub-categories of motivation that can impact an individual’s behavior: amotivation, extrinsic motivation, and intrinsic motivation.

Amotivation

Amotivation is a state lacking in intention to act and can result from expectations that the intended action will most likely not be successful or that it will fail to lead to the promised outcome, or from perceiving no value in the outcome (DuBois et al., 2013). When organizations are undergoing environmental sustainability change, a significant challenge is

to minimize the number of employees who lack any motivation to support or participate in change initiative (DuBois et al., 2013).

Extrinsic Motivation

According to self-determination theory (Deci & Ryan, 1985; Gagne' & Deci, 2005), there are four types of extrinsic motivation: compliance, introjection, identification, and integration.

Compliance

Compliance is the most controlled or least self-determined type of extrinsic motivation. At this stage, individuals perceive externally regulated behavior as controlled and their actions have an external perceived locus of causality (Deci & Ryan, 1985). This motivation state is highly contingent upon external factors such as rewards and/or punishment; it is impersonal and characterized by short-term impact. Compliance with environmental sustainability policy and reporting serves as a starting point for environmental sustainability within an organization. However, relying on compliance limits the implementation of effective environmental sustainability change. Employees can resent excessive rules and organizations can't specify every behavior they seek (DuBois et al., 2013).

Introjection

Introjection involves taking in a regulation but fully accepting it as one's own. Behaviors are performed to avoid guilt or anxiety, or to attain ego enhancement such as pride (Deci & Ryan, 1985). For employees at the introjected motivation state, organizations might include employee reinforcement to instill pride in their contributions to organizational environmental sustainability goal accomplishment (DuBois et al., 2013). Employees still lack

personal value for environmental sustainability at this stage, but this begins to emerge in the next stage: identification.

Identification

Identification is a “more autonomous, or self-determined form of extrinsic motivation, which reflects conscious value for a behavior even in situations when the behavior might not be intrinsically appealing” (DuBois et al., 2013, p. 195). Individuals with this type of motivation will be driven by subjective norms about green behavior or will perceive value in behaviors that are socially important. Motivation at this stage is still heavily guided with reference to others (DuBois et al., 2013).

Integration

Integration is the most self-determined type of extrinsic motivation and the shift towards internal reference begins in this stage (DuBois et al., 2013). Integration occurs when identified behavior regulations are fully assimilated into the self or congruent with one's other values and needs. Integration also closely resembles intrinsic motivation. Integrated behaviors are still considered extrinsic because they are undertaken to attain separable outcomes rather than for their inherent enjoyment (DuBois et al., 2013).

Intrinsic Motivation

Intrinsic motivation describes one's natural inclination toward assimilation, master, spontaneous interest, and exploration, and it represents a principal source of enjoyment and vitality throughout life (Ryan & Deci, 2000). Previous studies have shown that the strength of a person's intrinsic pro-environmental motivation predicts how much they behave pro-environmentally (Sharpe et al., 2021). For instance, the stronger a person's intrinsic pro-environmental motivation, the more they supported energy policy and intended to save

energy (Sharpe et al., 2021). Environmental sustainability behavior change can be facilitated by organizational efforts to ignite employees' intrinsic motivation to behave in an eco-friendly manner (Dubois, et al., 2013). Simply providing a setting that facilitates intrinsically driven employee green behavior that pushes the boundaries can forge new ways to optimize goals related to environmental sustainability (DuBois, et al., 2013).

Barriers

Barriers associated with green workplace behaviors have not often been the focus of in-depth studies (Yuriev et al., 2018), as environmental researchers have often focused on employees' motivations to participate in these behaviors (Blok et al., 2015; Greaves et al., 2013) while overlooking the negative effects of barriers (Norton et al., 2015). However, the context in which green workplace behaviors are exercised is linked to obstacles or barriers in performing these behaviors (Andersson et al., 2005; Stern, 1999). Research has found that barriers to green workplace behaviors are related to individual characteristics and the organizational setting (Norton et al., 2015). Additionally, Velazquez, Munguia, and Sanchez (2005) identified four barriers to participating in campus sustainability initiatives: 1) lack of awareness and interest in sustainability, 2) organizational structure of the institution, 3) lack of funding, and 4) lack of support from administrators.

Personal Obstacles

Blake (1999) identified three barriers to engaging in green behaviors: individuality, responsibility, and practicality. One's attitude and temperament are considered individual barriers, and they are more common among individuals that do not have a strong environmental concern. Barriers related to responsibility occur when people don't participate in green behaviors because they feel that they cannot influence the situation or

should have to take the responsibility for it. A lack of trust in an institution often stops people from engaging in green behaviors. Practicality as a barrier is related to the social and institutional constraints that prevent people from engaging in green behaviors, regardless of attitudes or intentions. Examples include lack of time, lack of money, and lack of information (Blake, 1999).

Although pro-environmental motivation can lead people to engage in green behaviors, other competing concerns (comfort, money, etc.) might deter them from these actions (De Groot & Steg, 2008; Evan et al., 2013). Green workplace behaviors depend on the efficient management of human resources, which is difficult to achieve through formal approaches only (Yuriev, et al., 2018).

Organizational Obstacles

In addition to personal obstacles, there are several potential organizational obstacles that prevent employees from participating in green behaviors while at work. Yuriev et al. (2018) conducted a systematic review of literature related to overcoming barriers to green behaviors in the workplace and found that organizational barriers can be divided into four categories: corporate values, expression of green “self,” support, and internal resources. Obstacles associated with corporate values are related to the lack of green culture within companies (Greene et al., 2014; Lamm et al., 2015, Manika et al., 2015) and the symbolism of pro-environmental goals (Cantor et al., 2012; Chou 2014). The second subset of organizational barriers focuses on “the ease with which employees can express their green self at the workplace” (Yuriev, et al., 2018, p. 387). A lack of support from managers and colleagues makes up the third sub-group of organizational barriers (Yuriev, et al., 2018). This includes ignorance of suggested initiatives (Alt & Spitzbeck, 2016; Temminck et al., 2015),

inability to motivate subordinates (Pinzone et al., 2016; Smith & O'Sullivan, 2012), and poor leadership (Blok et al., 2015; Graves et al., 2013; Robertson & Barling, 2013). Finally, organizational barriers related to a lack of internal resources (financial, human capital, time) frequently prohibit employees from engaging in green behaviors (Yuriev, et al., 2018).

Universities as Organizations

According to Perkins (1973), the university is one of the most complex organizations in modern society, which can be contributed to multiple and conflicting missions: teaching, research, public services, and the achievement of democratic community. An organization's environmental impact is affected by its institutional context (Unsworth, et al., 2021). Therefore, when investigating the implementation and impact of sustainability initiatives in higher education, researchers must look beyond the student level and consider the university on a larger, organizational scale. As noted by Sharp (2002), "considering the nature of organizational culture within universities can deepen the understanding and inform strategy for achieving new levels of institutional engagement in environmental sustainability" (p.136).

Universities have several missions, while other organizations typically do not. Birnbaum (1988) stated, "as colleges and universities become more diverse, fragmented, specialized, and connected with other social systems, institutional missions do not become clearer; rather, they multiply and become sources of stress and conflict rather than integration" (p.11). Colleges and universities are also seen as paradoxical because even though they are one of the largest industries in the nation, they are considered by many to be the least businesslike and well-managed of all organizations (Birnbaum, 1988; Keller;

1983). Additionally, “there is no metric in higher education comparable to money in business, and no goal comparable to profits” (Birnbaum, 1988, p.11).

Furthermore, because both institutions of higher education and businesses or corporations vary widely, there is no simple way to compare the organization and operation of the two (Besse, 1973). According to Besse (1973), “businesses are both large and small, simple and complex, concentrated and dispersed, closely held and widely owned, specialized and complexly integrated, and successful and unsuccessful” (p. 107). Similarly, higher education institutions “are large and small, specialized and comprehensive, publicly and privately supported, limited or unlimited in the level of education offered and subject matter covered, adequately and inadequately endowed, generously and stingily supported, and variously integrated by race, sex, religion, and talent” (Besse, 1973, p. 107).

Because the success of an organization’s strategic initiatives relies on the collective effort and accumulation of employee behaviors (Carmeli, et al., 2017; Strauss, et al., 2017), the composition of university employees, or the academic community, should be considered. Historically, universities were considered “communities of scholars” with shared values, but on many campuses today, there is a dichotomy of interests between administration and faculty which interferes with the notion of shared sentiments and common values (Sanders, 1973). Those who deal with campus problems daily have witnessed the “erosion of the sense of community, especially with respect to the general goals of higher education, the purposes of any given institution, and the parts different members of the university community should play in carrying out these purposes” (Sanders, 1973, p. 59). As universities have grown in the past few decades, including an increase in student enrollment and the number of non-faculty staff positions, it is easy to imagine this notion of academic community has further

deteriorated. Such a lack of sense of community among university employees could negatively impact an institution's strategic plan, especially if there are no shared values.

According to Sanders (1973), "the existence of a shared value system or its lack shows up in agreement or disagreement within the university community about some matters that set the tone of the institution" (p. 63). This could have important implications on employee participation in green behaviors at work. If employees don't value environmental sustainability or see it as something the university should be involved in, then it makes sense that employees would not participate in green workplace behaviors. On the other hand, if environmental sustainability is valued among most university employees, especially among the administration or leadership, then employee participation in green behaviors at work would be more common.

Study Location

The university that is the site of this research study currently employs approximately 3,500 staff and 1,600 faculty. Females (52.8%) make up the majority of staff, compared to 47.2% of males. Most faculty identify as males (53%) and 47% identify as females. As a predominantly White institution (PWI), this is reflected in the racial makeup of its employees: 83.3% of staff (n=2,962) and 78.3% (n=1,265) of faculty are White. The Millennial generation (those born between 1981-1996) is the most common generation among the staff (37.5%), followed closely by Generation X (those born between 1965-1980) at 36.6%. Generation X is by far the most common generation represented among the faculty (46.7%). Additionally, the largest percentages of staff (46%) and faculty (32%) have been continuously employed at the university for less than five years.

Current Sustainability Initiatives

This university's involvement in environmental sustainability can be traced back to 1991, when the campus recycling program was established. The 1990s saw the implementation of recycling bins in residence halls and the creation of the Committee on the Campus Environment (CCE) and in 2004, the university's first ever environmental policy was developed by the CCE. In 2007, the first Sustainability Manager was hired, and a composting facility was established a few years later.

As outlined on the Office of Sustainability's website, there are several sustainability initiatives in place today to assist students and employees in reducing their environmental impact on campus. Waste reduction initiatives are the most common, which include the placement of recycling bins around campus, including inside and outside across the campus grounds, the implementation of the My Tiny Trash program, the Green Office program, the Mug Project, Zero-Waste Gameday, the Move Out Donations program, and Eco To-Go. The My Tiny Trash program seeks to promote waste awareness, encourage environmental stewardship, increase recycling rates, and decrease landfill waste on campus. This is done by swapping traditional desk-side trash cans with three-quart Tiny Trash containers attached to a larger recycling bin. The Green Office program engages faculty and staff in an interactive certification program aimed to help offices contribute to the university's goals of achieving carbon neutrality by 2061 and 50% waste diversion by 2030. The Mug Project is a campus-wide initiative that seeks to eliminate single use containers and bottles by encouraging and incentivizing the use of reusable bottles and mugs on campus. Zero-Waste Gameday integrates fan experience, academic research, student leadership, and community engagement to actively work towards zero waste at campus athletic events. The Move Out

Donation program involves partnering with the campus food pantry, Goodwill, and other local non-profit organizations at the end of each semester to ensure that items students haven't used during the semester don't end up in the landfill. Students are encouraged to donate new and certain lightly used items in their residence halls during the move-out period. The Eco To-Go program is a new program in the pilot stage. It involves a partnership with campus dining and the Office of Sustainability in which reusable to-go boxes are available in one of the campus dining halls. This program seeks to aid in decreasing the amount of Styrofoam in the campus waste stream, helping the university to meet its zero-waste goal.

In addition, the compost facility helps reduce the amount of organic waste in landfills by using composting material as fertilizer for campus gardens and green spaces. The Free Store is a community shared space that allows the campus community to shop for free, high-quality, lightly-used clothing, kitchenware, accessories, and small appliances at regularly scheduled pop-up events held throughout each academic year. The Free Store helps keep unwanted clothes and other items out of the landfill. Finally, the campus Grow Lab, a living laboratory that promotes experiential and service-learning, demonstrates ecological food production methods and encourages community engagement.

Recent research efforts by the Office of Sustainability and the CCE have focused mostly on understanding students' attitudes, beliefs, and perceptions regarding specific sustainability initiatives or environmental concerns. For example, in spring 2021, the CCE created a Sustainable Energy Working Group, which was tasked with investigating students' attitudes and opinions about sustainable energy before implementing sustainable energy projects on campus. During the spring 2022, an Electric Vehicle (EV) Working Group was

created that will work to create an EV Strategic Plan for campus. It is anticipated that feedback will be sought from both students and employees, but that has not happened at this time. When staff or faculty have been included in previous campus sustainability surveys, there has been a low response rate from this group. For instance, a campus-wide survey was distributed during spring 2022 that sought to learn more about sustainable transportation preferences among the university population (students and employees), and only about 3% of respondents were employees (campus Sustainability Manager, personal communication, April 20, 2022).

While this study seeks to address gaps in the literature, it also seeks to address the following gaps in research on this university's campus: 1) determine what green behaviors or campus sustainability initiatives faculty and staff are aware of and are participating in, 2) identify what motivates this population to participate in green behaviors, and 3) learn more about potential barriers to participation in green workplace behaviors.

Theoretical Frameworks

The theoretical framework for this research study is based on a combination of two theories: Self-Determination Theory (SDT) and the Systems Thinking. SDT focuses more on the individual (i.e., employees) and systems thinking focuses more on the organization (i.e., university).

Self-Determination Theory

SDT is a theory of motivation that has been applied to many life domains including health, sport, and education (Ryan & Deci, 2017). SDT posits a self-determination continuum that ranges from amotivation to intrinsic motivation, with extrinsic motivation in the middle (Deci & Ryan, 1985; Gagne' & Deci, 2005). This theory suggests that all humans have three

basic psychological needs that underlie growth and development: autonomy, competence, and relatedness. Autonomy is the feeling one has choice and is willingly endorsing one's behavior. Competence is the experience of mastery and being effective in one's activity. Needing to feel connected and a sense of belongingness with others is relatedness. According to this theory, our social environment, including family, friends, co-workers, culture, etc., can either promote or get in the way of having these psychological needs met. Evidence suggests that people are more autonomous in their behaviors and more likely to persist when these needs are met (Ryan & Deci, 2017). This theory suggests that people tend to be driven by a need to grow and gain fulfillment and that one's tendency to engage in proactive or passive behavior is largely influenced by the social conditions in which they were raised; social support is key (Deci & Ryan, 1986; Gagne' & Ryan, 2005). Additionally, there are two assumptions of SDT: 1) the need for growth drives behavior, and 2) autonomous motivation is important. This theory influences the questions in this study relating to employees' motivation to participate in green workplace behaviors.

Systems Thinking

According to Stroh (2015), systems thinking is the ability to understand the interconnections of a system in such a way as to achieve a desired purpose. This approach is especially useful in addressing complex problems that often involve creating organizational change. Creating change within an organization is often challenging and there are four challenges of change that systems thinking addresses. Systems thinking 1) motivates people to change behavior because they discover their role in exacerbating the problems they want to solve, 2) catalyzes collaboration because people learn how they collectively create the unsatisfying results they experience, 3) focuses people to work on a few key coordinated

changes over time to achieve systemwide impacts that are significant and sustainable, and 4) stimulates continuous learning, which is essential for any meaningful change in complex systems (Stroh, 2015).

When considering environmental sustainability issues such as at the university in this study, DuBois et al. (2013) says examining the whole system allows for consideration of multiple stakeholder concerns and externalities. A “systems perspective facilitates understanding of the organization as a whole and complex entity, with appreciation for how the various levels and areas of the organization function and interact (p. 187). According to Ones & Dilchert (2013), “sustainable organizations require a systems approach for ensuring a careful balance of environmental, social, and economic performance (Jackson et al., 2012), and employee behaviors are a major contributor to organizational environmental performance” (Ones & Dilchert, 2013, p. 122).

Understanding the whole system means appreciating a situation you want to change through a systemic rather than conventional lens (Stroh, 2015). As explained by Meadows (2008), information is the key to systems thinking because it holds systems together and determines how they operate. Systems thinking influences this study’s design by seeking to gather information about employees’ awareness of and participation in campus sustainability initiatives, motivation to participate, and any systemic barriers in place that keep employees from engaging in green workplace behaviors. For example, learning more about employees’ awareness helps identify gaps where awareness is missing, which provides insight into where the university should focus awareness efforts. On the other hand, it also helps identify where awareness is already high, thus justifying shifting resources to focus on areas where more awareness is needed. In addition, collecting data about

employees' motivation to participate in green workplace behaviors can inform strategies for increasing employee participation. Learning about employees' perceived barriers could help identify if any barriers exist at the systemic level (e.g., no composting bins in a building) and hopefully effect change, if needed.

Chapter Summary

In summary, this chapter included a review of the literature related to this study. Literature related to the importance of sustainability was briefly discussed, with a focus on sustainability in higher education and the workplace. Factors impacting sustainability were also discussed, including awareness, motivation, and barriers. Universities as organizations was addressed, including a comparison of universities to corporations. The study location and current sustainability initiatives at that university were discussed in detail. The chapter ended with a review of the theoretical frameworks that guide this research. Chapter 3 describes the study's research design and methodology in more detail.

CHAPTER 3: METHODOLOGY

This chapter describes the descriptive survey design that the researcher used to better understand employees' green behaviors while working at an R1 University. Previous and current assessment efforts of sustainability initiatives at this institution have primarily focused on students. Based on conversations with Office of Sustainability staff, there has been limited response from staff or faculty when they have been included in these efforts. Therefore, to gain a more comprehensive understanding of the overall reach and effectiveness of campus sustainability initiatives beyond the students' perspective, this study focused on employees.

This descriptive study sought to address the following research questions: 1). To what extent are university employees aware of campus sustainability initiatives? 2) To what extent are employees participating in campus sustainability initiatives at work? 3). What motivates university employees to engage in green behaviors while at work? and, 4). What barriers exist that prohibit university employees from engaging in green behaviors while at work?

The research methodology used to answer these research questions are presented in this chapter. First, the research design and rationale for the design is discussed, including the population, sampling, and recruitment of participants. Next, the instrument used to collect data in this study is discussed in detail. The chapter concludes with a discussion of how the data were cleaned, and includes a detailed analysis plan of how each research question was answered.

Research Design

The research design for this study was a descriptive survey research design. The purpose of survey research is to generalize from a sample to a population so that inferences can be made about a population's characteristics, attitudes, or behaviors (Babbie, 1990). This study sought to understand and describe the sustainability initiatives and green behaviors that university employees are aware of and participating in at a specific campus. Characteristics and frequencies related to campus sustainability initiatives were of interest in four main areas among this study's population: awareness, participation, motivation, and barriers. This study was cross-sectional rather than longitudinal in that the survey information was collected from participants at only one point in time (Creswell, 1994).

The primary data collection method for this study was an anonymous online Qualtrics survey that contained both closed and open-ended questions. A survey was chosen over other data collection methods such as focus groups or interviews because the survey has the potential to reach a larger sample size in a shorter period compared to other methods. This method will also provide the university in the study with useable quantitative and qualitative data gathered from both closed and open-ended survey questions. The campus sustainability stakeholders will be able to use information collected from this study to make data-informed decisions related to environmental education efforts and ongoing sustainability initiatives.

According to Robinson and Leonard (2019), there are many advantages to using surveys for data collection, including 1) capturing needed information with relatively limited resources, 2) generalizing about a larger population from a smaller sample of respondents, 3) comparing responses between subgroups, and 4) capturing a large dataset formatted for ease of analysis. Possible limitations of survey research include 1) a low response rate means

low validity, 2) response bias (e.g., social desirability bias), and 3) survey fatigue or nonresponse among participants negatively affect data collection (Robinson & Leonard, 2019).

Sampling Methods and Recruitment

Participants in this study included staff and faculty employed at an R1 University in the southeastern part of the U.S. during the month of August 2022. A review of the institution's Human Resources dashboard indicated there were 1,607 faculty and 3,606 staff employed at the time of participant recruitment. Based on a sample size table by Johnson and Christensen (2017), the targeted sample size for a population of 5,000 is 357, and it is 361 for a population of 6,000. The confidence level for these sample sizes is 95%. Since the total number of faculty and staff at this institution is approximately 5,200, the ideal sample size for this study is around 357 participants.

Probability and nonprobability sampling methods including purposive, snowball, and convenience sampling (Rea & Parker, 2005) were used to recruit study participants. According to Rea and Parker (2005), one disadvantage to non-probability samples is they do not allow for the ability to generalize research findings with a known degree of accuracy. However, the primary advantage of non-probability sampling is its ease of use and usefulness in the preliminary stage of a research project.

First, purposive sampling was used to recruit study participants. The researcher used an Excel spreadsheet to document known campus contacts and their email addresses, which resulted in 79 potential participants. These participants were then sent a recruitment email (see Appendix A). To keep survey participation truly anonymous, Qualtrics was not used to distribute recruitment emails. Instead, the researcher emailed participants through regular

campus email. Therefore, follow-up emails reminding participants to complete the survey were not a possibility.

Next, probability sampling was used to recruit additional participants. The researcher selected a random sample of 1200 email addresses from an Excel file containing approximately 5000 employee email addresses that the researcher received from the university's Office of Research. An online random sample generator was used to select potential participants, who were then sent the same recruitment email previously mentioned. After one week, only 223 participants had completed the survey. Therefore, an additional random sample of 1200 employee email address was selected from the Excel file and this group was also sent a recruitment email.

Finally, snowball sampling was also used in participant recruitment. Attached to the recruitment email sent to known contacts and random participants was a recruitment flyer (see Appendix B). Participants were asked to share the flyer with any colleagues in their offices or across campus who they thought might be interested in participating in the study.

To increase survey response rates, 40 local coffee shop gift cards in the amount of \$10 were offered as an incentive. At the end of the survey, participants were asked to enter their university email address into a separate Qualtrics form if they were interested in entering the random drawing for one of the gift cards. This allowed the gift card drawing entries to remain separate from survey responses, maintaining anonymity. After the survey ended, the gift card entry responses (n=238) were downloaded into an Excel spreadsheet, and an online randomizer was used to select 40 gift card recipients. These 40 individuals were sent an electronic gift card to the email address listed in their drawing entry.

Sample Participants

A total of 397 participants completed the survey, which slightly exceeded the targeted sample size of the study. In line with the overall campus demographics, most of the participants were staff (70%) and most identified as women (61%). Of the faculty respondents, most reported they were 9-month faculty (80%). Additionally, most participants (96%) reported they work full-time, and most (63%) have been employed at the university for 10 years or less. Most participants reported they belonged to three generations: 1) Generation X (Gen X) (38%), 2) the Millennial Generation (Millennials) (35%), and 3) the Baby Boomer Generation (Boomers) (21%). About half (55%) of respondents considered their political beliefs to be either mostly or consistently liberal, compared to 14% of participants who hold mostly or consistently conservative political beliefs.

Moreover, most participants (56%) reported they currently work on-campus, with 38% indicating their work situation is hybrid: a combination of working on-campus and remotely. Overall, most participants (60%) reported they work within one of the academic colleges on campus and only two colleges (Architecture & Design and Veterinary Medicine) did not have any participant representation in the study. Among the participants who reported they do not work within a specific academic college, the most common areas where respondents worked were the Division of Student Success (14%) and the Division of Student Life (13%). A more detailed analysis of participants' demographics, including figures and tables, can be found in Chapter 4: Findings.

Measures

Items for the instrument used in this study were developed through brainstorming, a review of the institution's Office of Sustainability website, and a literature review focused on three factors impacting green behaviors in the workplace: awareness, motivation, and barriers. A search for an existing instrument that measured these constructs resulted in scales that measured recycling behavior, environmental attitudes, incentive to adopt green behaviors, and ecological worldview among employees in corporate settings, but no one instrument was found that focused on measuring all three constructs on a university campus. All items were developed by the researcher and were not adapted from previously published scales. Table 2 on the following page shows the sources used to inform the development of survey items.

Study Materials

The university's Office of Sustainability website was reviewed in great detail to learn more about the history and mission of the office, to identify all sustainability initiatives currently in place on campus, including their descriptions. Additionally, the Campus Sustainability Master Plan was found on this website, which lays out the institution's ten-year vision for a more sustainable and globally engaged campus. Information from this website was used to inform the development of an anonymous online survey, which was the primary data collection method for this research.

Online Survey

Data were collected via an anonymous online survey (see Appendix C) consisting of a screening question and 29 items divided into four sections: 1) awareness and participation, 2) motivation, 3) barriers, and 4) demographics. The consent form (see Appendix D) was placed at

Table 2: Survey Item Sources

Survey Items	Source
Awareness & Participation: items Q2-Q11	• Institution's Office of Sustainability website and Sustainability Master Plan • Expert review panel
Motivation: items Q12-Q16	• Unsworth, et al. (2021) • Temminck, et al. (2015) • Robertson & Barling (2013) • Expert review panel
Barriers: items Q17-Q20	• Yuriev et al. (2017) (2018) (2020) • Norton et al. (2015) • Velazquez et al. (2005) • Expert review panel
Demographics: items Q21-31	• Larsen (2001) • Park & Ha (2014) • Institution's Office of Institutional Research website • Expert review panel

the beginning of the survey, and before proceeding, participants were required to indicate they agreed to participate in the study. Following the consent form and agreement to participate question, participants were asked a screening question to determine if they were faculty, staff, administration, or students. If the faculty option was selected, participants were asked to indicate if they were 9-month or 12-month faculty. If the student option was selected, participants were directed to a message that says they are not eligible to participate in the study. A review of the survey responses revealed no respondents selected the student option.

The first section of the survey focused on awareness and participation, which consisted of ten questions (eight closed-ended, two open-ended) that sought to understand which campus sustainability initiatives employees are aware of and in which ones they have participated. For example, one question provides a list of all the campus sustainability initiatives and asks participants to select which ones they have heard of, seen, or participated in. Another question asks participants to identify from a list which items can be recycled on campus.

Next, the motivation section included six questions (five closed-ended, one open-ended) and the purpose of this section was to understand employees' motivation to participate in green behaviors at work. The instructions for this section included the following definition for green behaviors: actions and behaviors that are linked with and contribute to environmental sustainability (Ones & Dilchert, 2012). In one question, participants were asked if they would be motivated to participate in green behaviors (i.e., recycling, composting, reusable mug, etc.) if their supervisor or department leadership

encouraged or promoted it. They were also given space to describe in more detail what would motivate them to engage in more green behaviors at work.

The third section focused on identifying barriers that keep employees from engaging or participating in green behaviors at work. This section consisted of four questions (three closed-ended, one open-ended) that sought to understand which of the following barriers have the most impact on employees' participation in recycling, composting, and saving energy while at work: 1) don't feel it's their responsibility, 2) inconvenient, 3) lack of information, 4) lack of time, 5) no barriers, and 6) other (please describe).

The final section of the survey focused on the following eight demographic variables: 1) current employment status 2) length of employment at this institution, 3) current work situation 4) current office or department, 6) generational status, 7) highest level of education completed, 8) current political beliefs, and 9) gender. Previous research (Larsen, 2001; Hansen et al., 2008) has found that age/generational status, education level, and political affiliation can impact whether individuals engage in green behaviors like recycling at home, therefore, that is why those specific variables were included. The other demographic variables are institutional-related and will help paint a picture of which types of employees, and which departments or offices are either engaging in green behaviors at work or not. This information could be used to help focus environmental educational and outreach efforts by the Office of Sustainability.

Survey Validity

To determine the survey's validity, or accuracy, the survey draft was shared with a panel of sustainability and research methodology experts. For this study, the expert panel included four individuals: 1) the university's Sustainability Manager, 2) the Director of the

university's undergraduate Sustainability Program, 3) an Assistant Professor in Evaluation, Statistics, and Methodology program who specializes in mixed-methods research, 4) and a recent graduate of an Evaluation, Statistics, and Methodology doctoral program whose professional experience includes designing online surveys.

After identifying potential individuals for the expert panel, the researcher emailed each one individually and explained the purpose of the study and asked if they agreed to review the survey and provide feedback. All four individuals agreed to participate. After they agreed to participate, the researcher sent each panel member a copy of the survey in a Word document and asked them to make any recommended changes or suggestions via track changes or by using the comments feature in Word. Panel members were given two weeks to provide feedback. Once feedback was received from all panel members, the researcher reviewed the feedback and made changes as needed before distributing the survey. The expert panel's recommended changes were minimal, and included a slight rewording of approximately three questions and the addition of one or two green behaviors.

Procedure

The online survey was created in Qualtrics, and questions were created with the Qualtrics mobile view activated to ensure items were compatible on a smartphone. After IRB approval, participants were recruited via email (see Appendix A), and a recruitment flyer was included as an email attachment (see Appendix B). The recruitment email and flyer included the study's purpose and description, participant eligibility, how to participate, and who to contact with any questions. The email included a link to the survey, and the flyer included both the survey link and a QR code for easy access with a smartphone.

Data Analysis

Survey results were exported from Qualtrics into an Excel spreadsheet so that data could be organized for analysis. Prior to conducting analyses of the survey results, all data were cleaned as recommended by Morrow and Skolits (2017). Descriptive statistics were used to summarize closed-ended survey questions. Group differences statistics, including independent t-tests and one-way analysis of variance (ANOVA) were conducted on select demographic groups to determine if any differences between the groups existed. Cross-tabulations were also conducted to see if relationships existed between select demographic groups and barriers.

Additionally, a thematic analysis (Braun & Clarke, 2006) was conducted on the qualitative data gathered from open-ended questions. Responses to these questions were entered into a separate Excel spreadsheet and then analyzed for the presence of any overarching patterns or themes. After data analyses were complete, data were visualized with Excel charts and tables. Relevant descriptive statistics and qualitative data were displayed via frequency counts. Table 3 on the following page shows a detailed analysis plan for each research question.

Chapter Summary

In summary, this chapter briefly described the research methodology that was used to answer the four primary research questions in this study. The rationale for the research design was also discussed. Additionally, the population and sampling procedures, and participant recruitment plan were discussed. The data collection method for this study was an online survey, and details about the development of that instrument were discussed in

Table 3: Data Analysis Plan

Research Question	Data Analysis	Survey Questions	Data Visualization
To what extent are university employees aware of campus sustainability initiatives?	- Frequency counts - Cross-tabulations to examine relationships between awareness and demographic variables - Thematic analysis of qualitative data	Q2-Q4 Q6 Q9-Q11	Graphic or table highlighting percentages/counts, group differences, and themes
To what extent do university employees participate in campus sustainability initiatives while at work?	- Frequency counts - Independent t tests and ANOVA to examine group differences among demographic variables - Thematic analysis of qualitative data	Q7-Q8	Graphic or table highlighting percentages/counts, group differences, and themes
What motivates university employees to engage in green behaviors while at work?	- Frequency counts - Independent t tests and ANOVA to examine group differences among demographic variables - Thematic analysis of qualitative data	Q12-Q13 Q15-Q17	Graphic or table highlighting percentages/counts, group differences, and themes
What barriers exist that prohibit university employees from engaging in green behaviors while at work?	- Frequency counts - Crosstabulations to examine relationship between barriers and demographic variables - Thematic analysis of qualitative data	Q18-Q21	Graphic or table highlighting percentages/counts, group differences, and themes

this chapter, including instrument validity. The chapter ended with a discussion of the data analyses.

CHAPTER 4: FINDINGS

This descriptive survey research study examined the extent to which university employees (faculty and staff) are aware of and participate in campus sustainability initiatives, including what motivates them to participate in green behaviors at work, and what barriers exist that keep them from engaging in green behaviors at work. This study was conducted in order to gather additional information on university employees' green workplace behaviors to inform gaps in the literature and to provide baseline data about employee's green workplace behaviors to the university's Office of Sustainability and the Committee on the Campus Environment (CCE). This data will be shared with these constituents to inform their future campus environmental education efforts. An anonymous online survey was used to collect feedback from employees, and a total of 397 participants completed this survey.

The research questions that framed the data collection for this study included:

- 1) To what extent are university employees aware of campus sustainability initiatives?
- 2) To what extent do university employees participate in campus sustainability initiatives?
- 3) What motivates university employees to engage in green behaviors while at work?
- 4) What barriers exist that prohibit university employees from engaging in green behaviors while at work?

This chapter provides an overview of the study's results and is organized into seven sections. The first section focuses on how the survey data were cleaned before any analyses

were conducted. The second section focuses on demographic data that describes the study's participants in more detail. The next four sections focus on the data analyses that corresponds to each of the four research questions. The final section of this chapter includes a summary of the overall key findings from the data analysis.

Data Cleaning and Analysis

Once the survey ended, the Qualtrics data were downloaded into an Excel workbook to organize data for statistical analyses. Responses to each question were added to a separate spreadsheet within the workbook so that responses to each question could be examined more closely to look for coding errors and missing data. Initial results showed that a total number of 435 participants responded to the survey, however, responses from 38 participants were excluded, resulting in a final sample size of 397. The first question of the survey asked if respondents wanted to participate in the survey. Three respondents selected "no" so the survey ended for them, therefore, these three participants were removed from the sample. One of the responses appeared to be a test response as it said "test" in one of the open-ended questions so that participant's responses were also removed. There were an additional 33 participants who did not fully complete the survey, so their partial responses were also removed. Finally, one of the participants chose "Not applicable" or "Prefer not to answer" on every closed-ended question, and on all open-ended questions, this person typed, "TINY TRASH NEEDS TO GO." Therefore, this participant's responses were excluded from the final analysis.

Additionally, missing data were identified for five questions. Each of these questions included a choice option of "not applicable" or "prefer not to answer" so the missing data were re-coded to these options. Two participants left a total of 19 blank answers for question

seven, which included a matrix table of 11 different statements. These blank responses were coded as “not applicable.” One participant skipped five answers for question 14, which included another matrix style table consisting of 10 statements. The blank responses were coded as the “not applicable” choice. One participant skipped question 22, which included a “prefer not to answer” option so that is how the blank response was coded. Eight participants did not answer question 26 and these blank responses were coded as the “prefer not to answer” option. The final question with missing data was question 31, the last question on the survey. Only one participant did not to answer this question, so the blank response was coded as the “prefer not to answer” option.

Quantitative Data

Of the 31 questions in the survey, 27 consisted of closed-ended questions. Excel was used to conduct initial descriptive statistics, frequencies, and percentages on all closed-ended questions. A separate Excel spreadsheet containing the responses to just these questions was imported into SPSS 28 for inferential statistical analyses. After the data were imported into SPSS, data cleaning techniques as discussed by Morrow and Skolits (2017) were conducted. Frequency counts were conducted on all variables to double check for missing data and descriptive statistics were conducted to look for any outliers. No outliers were found and since the missing data were less than 5%, they were coded as missing in SPSS and excluded from statistical analyses.

Qualitative Data

While four survey questions were open-ended, there were also seven closed-ended questions including an open-ended “other” option where participants could list or describe their responses. Not every participant chose to answer the open-ended questions, so any

blank answers were deleted before analyzing the data for these questions. A thematic analysis (Braun & Clarke, 2006) using an open-coding method (Saldana, 2016) was conducted on the qualitative data from these questions. The written responses from these questions were analyzed by question within the Excel workbook. Theme columns were added to each open-ended question's spreadsheet. The first round of open-coding involved reviewing each response and identifying any themes that were present in the participants' responses. Some responses had one theme and others consisted of two or three themes. A second round of coding involved identified if any of the first-round themes were similar enough to be combined. Frequency counts of each theme were then calculated and select participants' quotes representing the most common themes were selected (Braun & Clarke, 2006).

Demographic and Background Characteristics of Participants

The survey in this study included a demographic section that consisted of nine closed-ended questions focusing on the following eight variables: 1) employment status, 2) length of employment, 3) work situation 4) work location 5) generational status 6) highest degree or level of education completed, 7) political beliefs, and 8) gender. In addition, a screening demographic question at the beginning of the survey asked participants about their primary role at the university. Descriptive statistics were conducted for each of these variables and results are presented below by variables.

Employees' Primary Role on Campus

After consenting to participating in the survey, respondents were first asked about their primary role at the university. Response options included 1) administration, 2) faculty, 3) staff, and 4) student. For those who selected faculty, a follow-up question asked if they

were a 9-month or 12-month employee. Most respondents (66%) reported they were staff, followed by 30% faculty, and 4% administration. Zero participants reported they were students. Among the faculty, 81% reported they were 9-month employees and 19% indicated they were 12-month employees. Because the response rate from administration was only 4%, their responses were included with staff responses for the rest of the analyses. This changed the response rate of staff participants from 66% to 70%.

Employment Status and Length of Employment

Participants were asked about their employment status at the university. Options included full-time, part-time, temporary, and prefer not to answer. Almost all respondents (96%) reported they work at the university full-time, followed by 2% who work part-time, and 2% who preferred not to answer. No respondents reported they work in a temporary position.

Next, participants were asked how long they have been working at the university. Options included 1) 5 years or less, 2) 6 to 10 years, 3) 11 to 20 years, 4) 21 to 30 years, 5) 31 or more years, and 6) prefer not to answer. Overall, 40% of employees reported they've been employed at the university for 5 years or less. Among staff, that number increased to 46% (employed 5 years or less) and among faculty, that number decreased to 27% (employed 5 years or less). A small percentage of employees (2%) choose prefer not to answer. Figure 1 on the following page shows a more detailed breakdown of length of employment among survey respondents.

Current Work Situation and Location

Participants were asked to select the option that best describe their current work situation. Choices included 1) on-campus, 2) remotely, 3) hybrid: combination of on-

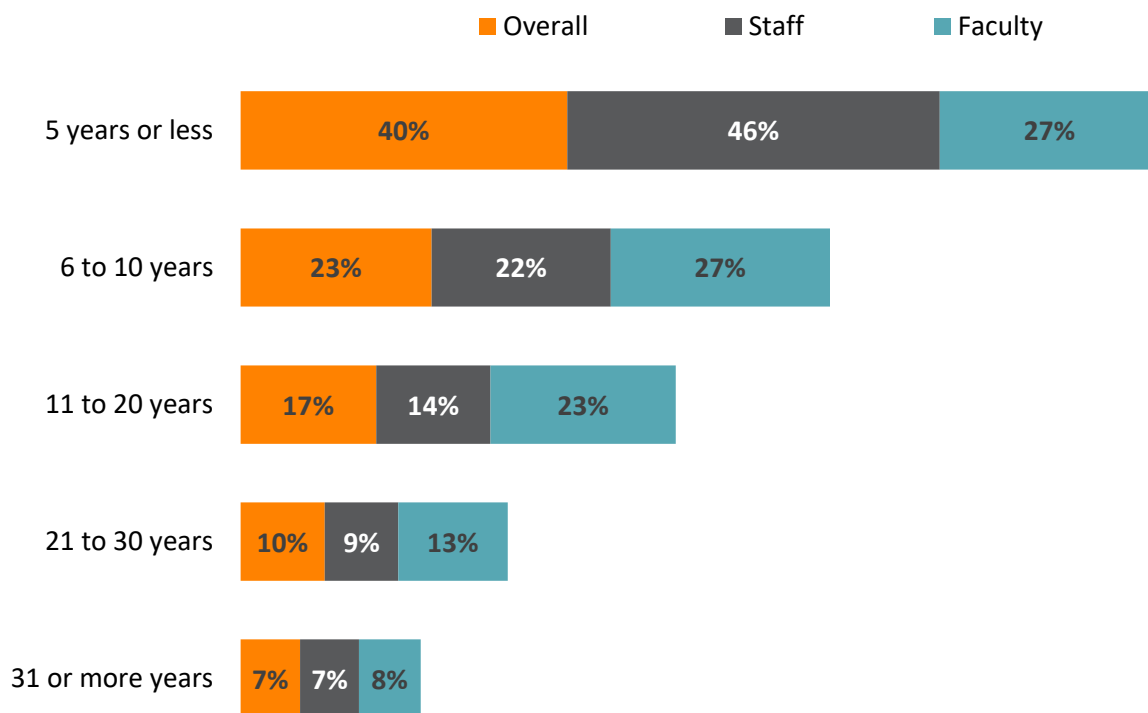


Figure 1: Participants' Length of Employment at the University

campus and remotely, and 4) prefer not to answer). Overall, about half of respondents (56%) reported they work on-campus, with 57% of staff reporting they work on campus, and 55% of faculty reporting they work on campus. Only 1% of respondents selected prefer not to answer for this question. Figure 2 on the next page includes more details about participants' current work situation.

Next, participants were asked if they work in a specific college at the university. Overall, most participants (60%) responded yes to this question, followed by 36% for no, and 4% for prefer not to answer. Among staff respondents, 51% replied no, 45% replied yes, and 4% replied prefer not to answer. As expected, most faculty (97%) replied yes. A small percentage of faculty (3%) selected prefer not to answer for this question. For respondents who selected yes, they were asked in a follow-up question to select the college in which they work. Overall, the most common college reported was Arts & Sciences with 33% of respondents selecting that option. All but two of the university's colleges were represented in the sample: Architecture & Design and the College of Veterinary Medicine. Table 4 shows the percentage breakdown of respondents from each college.

Moreover, the 36% of respondents who indicated they do not work in a specific college on campus were asked to select the office, department, or division in which they work. The most common response was the Division of Student Success at 14%, followed by the Division of Student Life at 13%, and 12% who chose other. Those who selected other were asked to describe their answers. The other responses included eight different locations: 1) the Graduate School (n=2) 2) the Center for Global Engagement (n=2), 3) Communications and Marketing (n=2), 4) satellite locations affiliated with the university (n=2), 5) the on-campus museum (n=1), 6) Alumni Affairs (n=1), 7) an interdisciplinary

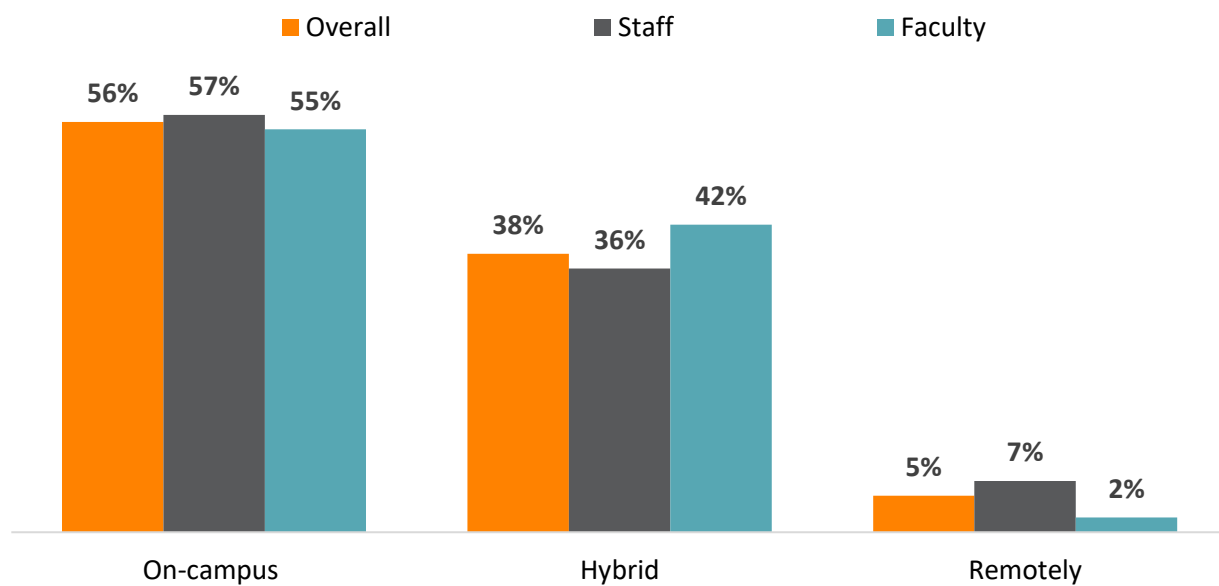


Figure 2: Participants' Current Work Situation

Table 4: Colleges Where Participants Work

College	Overall	Staff	Faculty
Arts & Sciences	33%	23%	45%
Business	11%	13%	10%
Education, Health & Human Sciences	10%	10%	9%
Engineering	9%	10%	8%
Communication & Information	7%	6%	8%
Nursing	3%	2%	4%
Law	3%	3%	3%
Social Work	3%	4%	2%
Agriculture	3%	2%	3%
Architecture & Design	0%	0%	0%
Veterinary Medicine	0%	0%	0%

research center on campus (n=1), and 8) the Educational Opportunity Center (n=1). Table 5 on the following page shows the percentage of respondents from all office/department options provided for this question. Since all faculty respondents indicated they work in a college or chose prefer not to answer, this table only includes staff responses.

Generational Status

Participants were also asked to select which generation they belong to and were given the following options: 1) Silent Generation (born 1928-1945), 2) Baby Boomer Generation (born 1946-1964), 3) Generation X (born 1965-1980), 4) Millennial Generation (born 1981-1996), 5) Generation Z (born 1997-2012), and 6) prefer not to answer. The top two generations represented among all participants were Gen X (38%) and Millennials (35%). Among staff, 37% identified as Gen X and 37% identified as Millennials. The most common generation represented among faculty respondents was Gen X (40%). Overall, 4% of respondents selected prefer not to answer. Figure 3 follows Table 5 and shows the generational status breakdown for all survey respondents.

Education Level

Participants were asked about the highest degree or level of education they have completed. Options included: 1) high school diploma or GED, 2) vocational certificate, 3) some college, no degree, 4) associate degree, 5) bachelor's degree, 6) master's degree, 7) doctorate or professional degree, and 8) prefer not to answer. Overall, 32% percent of respondents indicated their highest degree was a doctorate or professional degree and 32% also reported a master's degree as their highest level of education. Among staff, the most common response was a master's degree (40%). Unsurprisingly, most faculty (83%)

Table 5: Staff Work Locations

Staff Work Location	% of Participants
Student Success	14%
Student Life	13%
Other	11%
Enrollment Management	8%
Office of Information Technology (OIT)	8%
Facilities Services	8%
Finance & Administration	8%
Office of Research, Innovation & Economic Development (ORIED)	8%
Prefer not to answer	5%
Academic Affairs	4%
Athletics	4%
Public Safety	4%
Human Resources	2%
University Libraries	2%
Diversity & Engagement	1%
Faculty Affairs	1%
Dining Services	0%

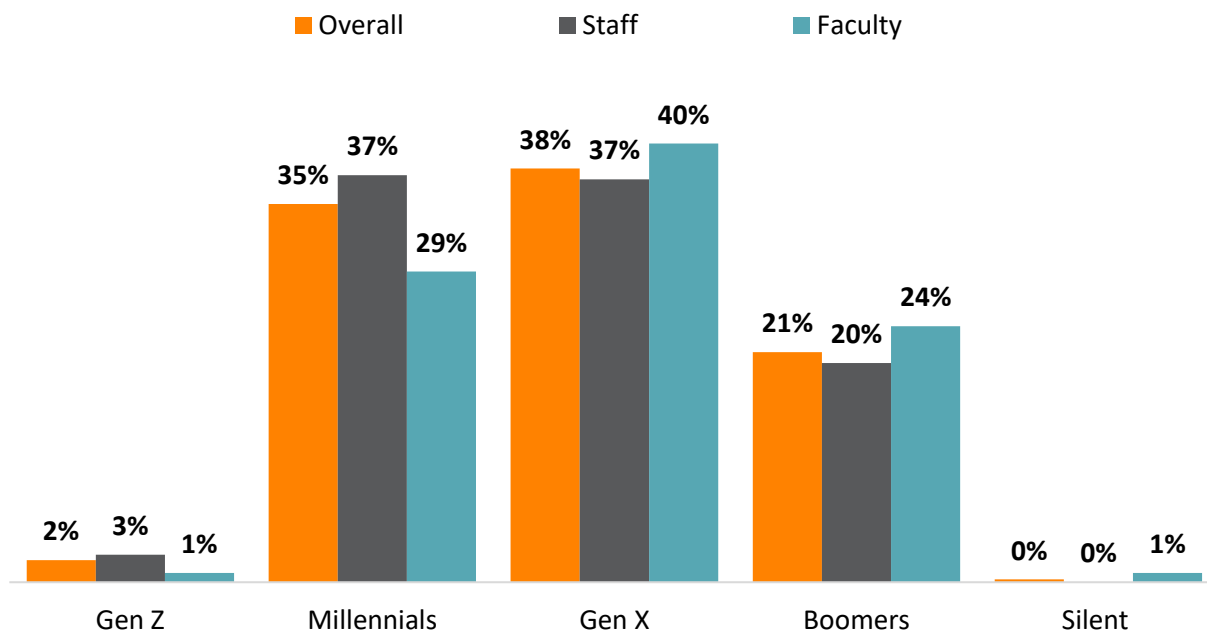


Figure 3: Participants' Generational Status

reported their highest degree as a doctorate or professional degree. Complete details for participants' education levels are shown on the next page in Figure 4.

Political Beliefs

Participants were asked which of the following best describes their political beliefs: 1) consistently conservative, 2) mostly conservative, 3) mixed, 4) mostly liberal, 5) consistently liberal, and 6) prefer not to answer. The most common political belief among all employees was consistently liberal (33%). This was also the most common response among staff (31%) and faculty (38%). The least common response was consistently conservative at 6% for all employees, 8% for staff, and 0% for faculty. However, this demographic question had the highest number of participants choose the prefer not to answer option (15%). Figure 5 on the next page shows additional details about participants' political beliefs.

Gender

Finally, the last demographic question asked participants about their gender. Options included 1) agender, 2) gender non-conforming or non-binary, 3) gender fluid, 4) man, 5) woman, 6) another identity (please describe), and 7) prefer not to answer. Most participants (65%) identified as women, and only around 2% of respondents reported an identity other than man or woman, and 5% chose prefer not to answer. Additional details about participants' gender are included in Figure 6.

Awareness (RQ1)

The first research question focused on determining to what extent university employees are aware of campus sustainability initiatives and seven survey questions were linked to this research question.

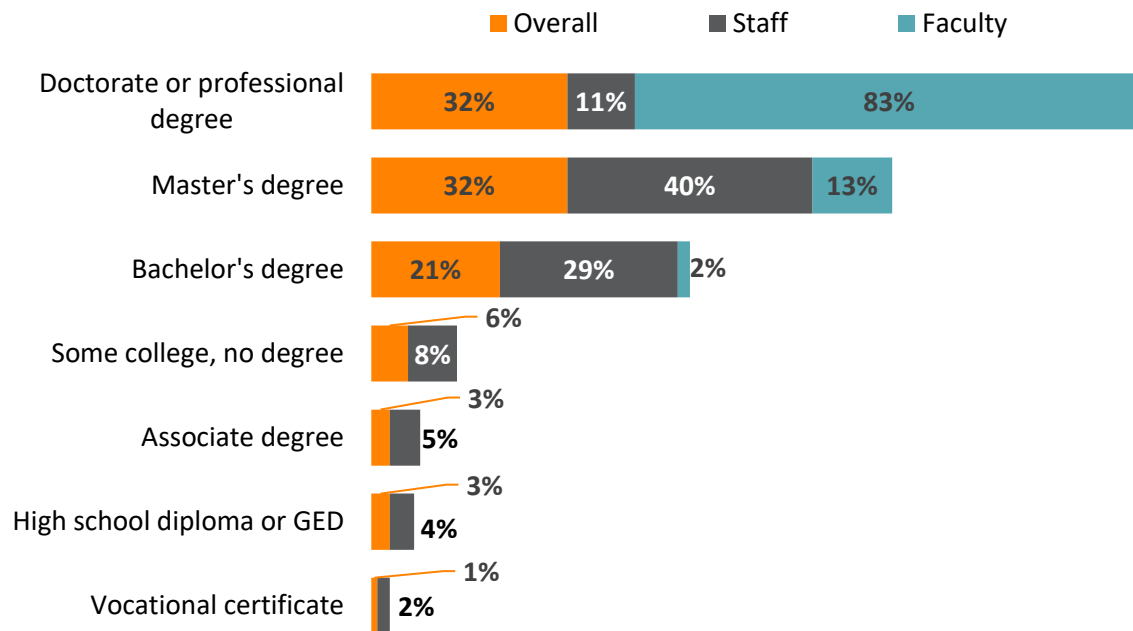


Figure 4: Participants' Education Level

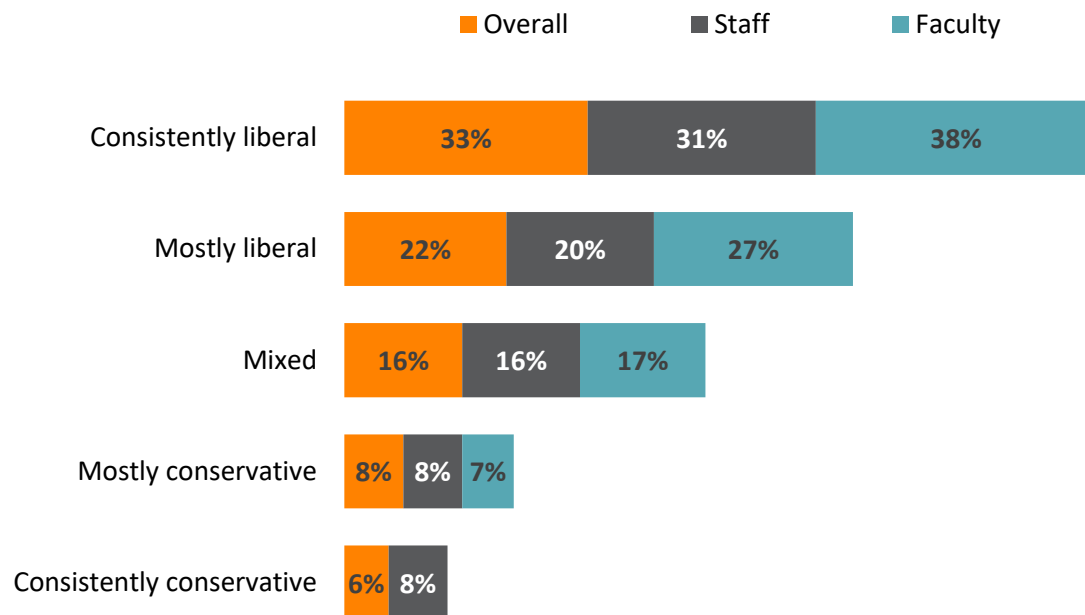


Figure 5: Participants' Political Beliefs

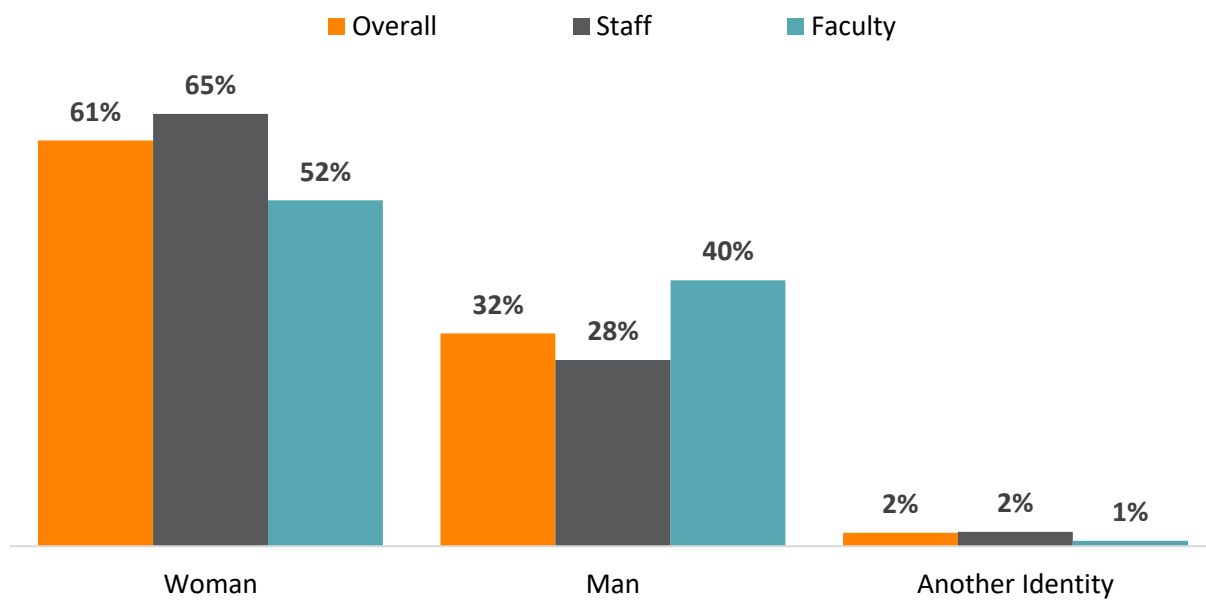


Figure 6: Participants' Gender Identity

Office of Sustainability

Participants were first asked if they were aware of the university's Office of Sustainability. Overall, most respondents (79%) reported they were aware of the office. Awareness of the Office of Sustainability was slightly higher among staff (81%) than faculty (73%), as shown on the next page in Figure 7.

In addition, a cross-tabulation analysis was conducted with the responses to this question and the following independent variables: 1) employee role (staff, faculty), 2) gender (women, men), 3) length of employment at the university (10 years or less, more than 10 years), 4) generational status (Boomers, Gen X, Millennials), and 5) political beliefs (conservative, mixed, liberal). Pearson's chi-square tests were used to examine the relationship between each of these independent variables and the awareness of the Office of Sustainability (dependent variable). Results showed there is a significant relationship between employees' awareness of the university's sustainability office and employee role, $\chi^2 (1, N=397) = 6.440, p=.011$. Staff are more likely than faculty to be aware of the Office of Sustainability.

Results also showed that there is a significant relationship between employees' awareness of the university's sustainability office and gender, $\chi^2 (1, N=368) = 8.346, p=.004$. Women are more likely than men to be aware of the Office of Sustainability. No significant relationships were found between employees' awareness of the sustainability office and their length of employment at the university, generational status, or political beliefs. See Table 6 for additional information about the relationship between employees' awareness of the Office of Sustainability and their primary role, gender, length of employment, generational status, and political beliefs.

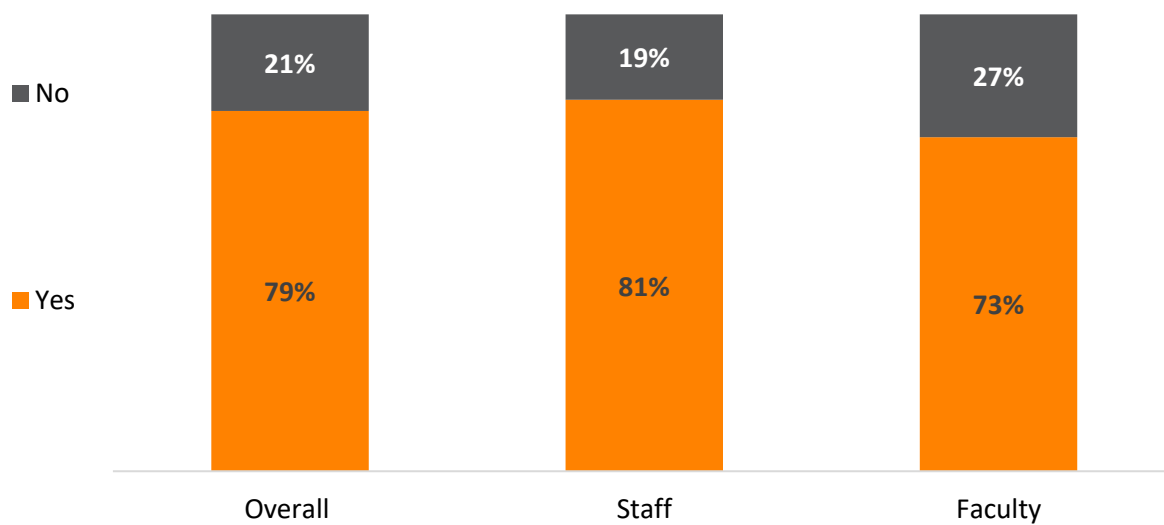


Figure 7: Participants' Awareness of the University's Office of Sustainability

The next awareness related survey question asked how employees learned about the Office of Sustainability, and participants were instructed to select all that apply from ten possible answers to this question, including an “other” option. The most common way participants reported they learned about the office was through a weekly university email that includes campus updates and news (25%). The second most common response was “saw signs around campus”, with 23% of participants selecting that option. Table 7 on the next page shows the percentage of all respondents and the ways they learned about the Office of Sustainability. Following Table 7, Figure 8 shows the most common themes for those who selected “other.” The themes in Figure 8 also include the frequency in which each theme was mentioned in participants’ responses.

Sustainability Initiatives

Next, participants were asked to select from a list of 18 sustainability initiatives the ones they have heard of, seen, or participated in. Participants were instructed to select all that apply, and choices also included “none of the above” and “other” options. The top four initiatives that participants knew about included 1) water bottle refill stations (90%), 2) interior recycling bins (89%), 3) exterior recycling bins (69%), and 4) electric vehicle charging stations (58%). Only 2% of participants selected the “none of the above” option. Table 8 shows complete details for this question. While four participants selected other, three of their responses matched initiatives already mentioned in the list and were coded as such. The remaining other option mentioned was the Student Green Fee.

Campus Master Sustainability Plan

Participants were also asked if they were aware that the university had a Campus Master Sustainability Plan in place. As shown in Figure 9, most participants (71%) were not

Table 7: Ways Participants Learned about the Office of Sustainability

Ways Participants Learned about Office of Sustainability	% of Employees
Weekly university email about events and updates	25%
Saw signs around campus	23%
Coworker or supervisor	17%
Other	16%
Office of Sustainability website	15%
Attended campus event hosted by Office of Sustainability	11%
Student(s)	7%
Social media	6%
Previous surveys distributed by the Office of Sustainability	5%
Work in the Office of Sustainability	1%



Figure 8: Other Ways Participants Learned about the Office of Sustainability

Table 8: Participants' Awareness of Campus Sustainability Initiatives

Campus Sustainability Initiatives	% of Participants Aware
Water bottle refill stations	90%
Interior recycling bins	89%
Exterior recycling bins	69%
EV charging stations	58%
Zero waste events	39%
Public recycling drop-off	36%
Zero Waste Gameday	32%
Campus compost facility	25%
Sustainability events	24%
The Mug Project	23%
The Free Store	22%
The Grow Lab	22%
Eco To-Go	21%
Move out donations	13%
Solar-powered outlets on picnic tables around campus	11%
Sustainability Champion	9%
The Green Office Program	9%
Committee for Campus Environment	8%
None of the above	2%
Other	0%

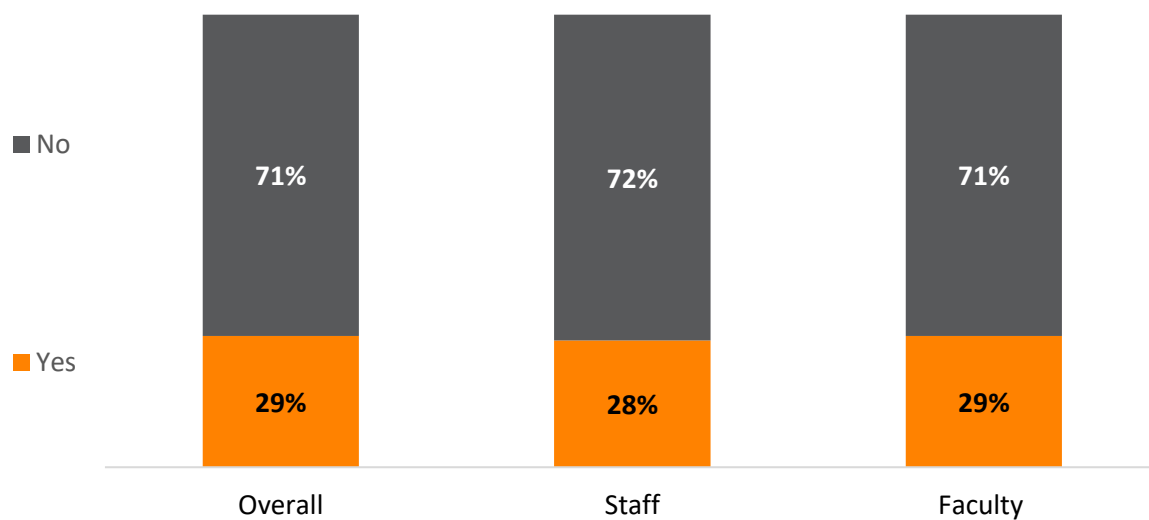


Figure 9: Participants' Awareness of Campus Sustainability Master Plan

aware of the campus master sustainability plan. A cross-tabulation analysis was conducted with employees' awareness of the campus sustainability master plan (dependent variable) and the following independent variables: 1) employee role (staff, faculty), 2) gender (women, men), 3) length of employment at the university (10 years or less, more than 10 years), 4) generational status (Boomers, Gen X, Millennials), and 5) political beliefs (conservative, mixed, liberal).

Pearson's chi-square tests were conducted to examine the relationship between each of these independent variables and the awareness of the campus sustainability master plan. Results showed there is a significant relationship between awareness of the campus sustainability master plan and length of employment at the university, $\chi^2 (1, N=388) = 6.362, p=.012$. Those who have been working at the university for more than 10 years are more likely to be aware of the campus sustainability master plan than those who have been employed 10 years or less.

Additionally, results of a Pearson's chi-square test also showed that there is a significant relationship between awareness of the campus sustainability master plan and employees' generational status, $\chi^2 (2, N=373) = 8.826, p=.012$. Baby Boomer employees are more likely to be aware of the campus sustainability master plan than Gen X and Millennial employees. There were no significant relationships found between employees' awareness of the campus sustainability master plan and their roles, gender, or political beliefs. Table 9 on the next page highlights additional details about employees' awareness of the campus sustainability master plan and demographic variables.

Table 9: Relationship Between Employees' Awareness of Campus Sustainability Master Plan and Demographic Variables

Variable	χ^2	df	Valid N	p-value *significant	% of Participants Within Variable	
Primary role	.040	1	397	.841	Staff	28.4% Yes 71.6% No
					Faculty	29.4% Yes 70.6% No
Gender	.000	1	368	.999	Woman	28.8% Yes 71.2% No
					Man	28.8% Yes 71.2 % No
Length of employment	6.362	1	388	.012*	10 years or less	24.6% Yes 75.4% No
					More than 10 years	36.8% Yes 63.2% No
Generational status	8.826	2	373	.012*	Boomers	41.7% Yes 58.3% No
					Gen X	23.8% Yes 76.2% No
					Millennials	26.8% Yes 73.2% No
Political beliefs	3.204	2	336	.202	Conservative	36.5% Yes 63.5% No
					Mixed	21.5% Yes 78.5% No
					Liberal	29.2% Yes 70.8% No

Chancellor's Campus Waste Diversion Goal

In addition, participants were asked if they were aware that the Chancellor had committed to diverting 50% of the university's waste from the landfill by 2030. Again, most participants (85%) were not aware of this goal (see Figure 10).

A cross-tabulation analysis was conducted with employees' awareness of the Chancellor's campus waste diversion goal (dependent variable) and the following independent variables: 1) employee role (staff, faculty), 2) gender (women, men), 3) length of employment at the university (10 years or less, more than 10 years), 4) generational status (Boomers, Gen X, Millennials), and 5) political beliefs (conservative, mixed, liberal).

Pearson's chi-square tests were conducted to examine the relationship between each of these independent variables and the awareness of the Chancellor's campus waste diversion goal. Results showed there is a significant relationship between awareness of the Chancellor's goal and employees' length of employment at the university, $\chi^2 (1, N=388) = 11.250, p < .001$. Employees who have been working at the university for more than 10 years are more likely to be aware of the Chancellor's goal to divert 50% of campus waste from landfills by 2030 than those who have been employed there less than 10 years.

Results of a Pearson's chi-square test also showed that there is a significant relationship between awareness of the Chancellor's campus waste diversion goal and employees' generational status, $\chi^2 (2, N=373) = 11.158, p = .004$. Baby Boomer employees are more likely to be aware of the Chancellor's goal to divert 50% of campus waste from landfills by 2030 than Gen X and Millennial employees.

Additionally, a Pearson's chi-square test found that there is a significant relationship between awareness of the Chancellor's campus waste diversion goal and employees' political

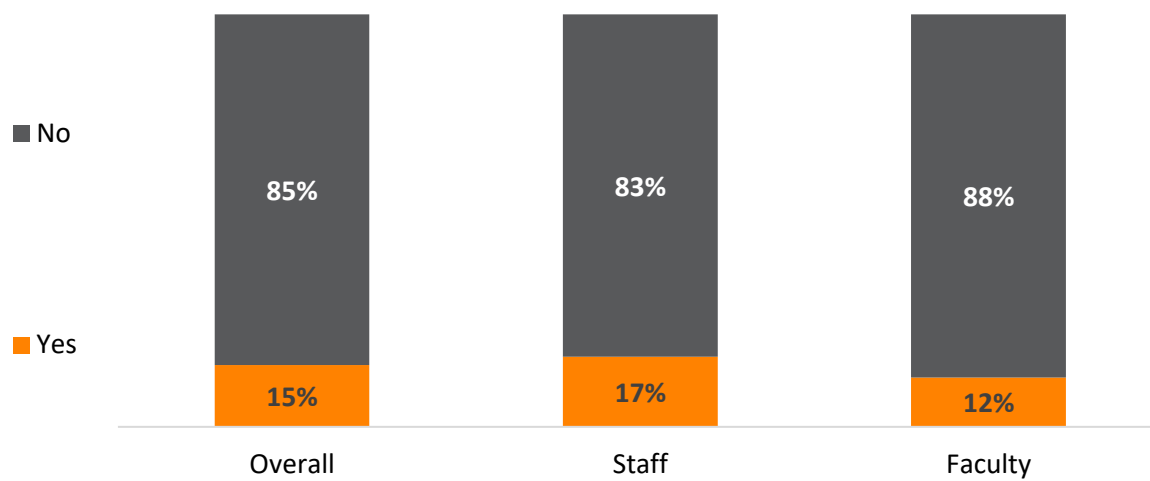


Figure 10: Participants' Awareness of Chancellor's Campus Waste Diversion Goal

beliefs, $\chi^2 (2, N=336) = 6.426, p = .040$. Employees with conservative beliefs are more likely to be aware of the Chancellor's goal to divert 50% of campus waste from landfills by 2030 than employees with mixed or liberal political beliefs. There were no significant relationships found between employees' awareness of the Chancellor's campus waste diversion goal and employees' role or gender. See Table 10 on the next page for additional details about the relationship between employees' awareness of the Chancellor's campus waste diversion goal and employee demographics.

Campus Recycling

Participants were asked to select from a list the items they were aware could be recycled on campus. Options included 1) aluminum cans, 2) batteries, 3) cardboard, 4) electronic waste, 5) food waste, 6) paper, 7) plastic bottles/containers, 8) plastic wrap/film, 9) steel cans, and 10) other (please describe). Unsurprisingly, the top three items that participants were aware could be recycled included paper (98%), plastic bottles/containers (96%), and aluminum cans (94%). For those who selected other, some indicated they thought glass could be recycled. Another mentioned crates, manure, and landscape materials. Following Table 10, Figure 11 shows the percentage of respondents who were aware which items could be recycled.

Employee Suggestions

The final question in the awareness section of the survey asked participants about their suggestions for increasing employees' awareness of campus sustainability initiatives. Approximately 44% of respondents provided answers to this question. A thematic analysis of responses was conducted, and overarching themes were identified. Figure 12 includes the

Table 10: Relationship Between Employees' Awareness of Chancellor's Campus Waste Diversion Goal and Demographic Variables

Variable	χ^2	df	Valid N	p-value *significant	% of Participants Within Variable	
Primary role	.174	1	368	.127	Staff	16.9% Yes 83.1% No
					Faculty	10.9% Yes 89.1% No
Gender	.174	1	368	.676	Woman	15.2% Yes 84.8% No
					Man	13.6% Yes 86.4% No
Length of employment	11.250	1	388	<.001*	10 yrs or less	10.7% Yes 89.3% No
					More than 10 yrs	23.5% Yes 76.5% No
Generational status	11.158	2	373	.004*	Boomers	26.2% Yes 73.8% No
					Gen X	13.2% Yes 86.8% No
					Millennials	10.1% Yes 89.9% No
Political beliefs	6.426	2	336	0.40*	Conservative	25% Yes 75% No
					Mixed	9.2% Yes 90.8% No
					Liberal	13.2% Yes 86.8% No

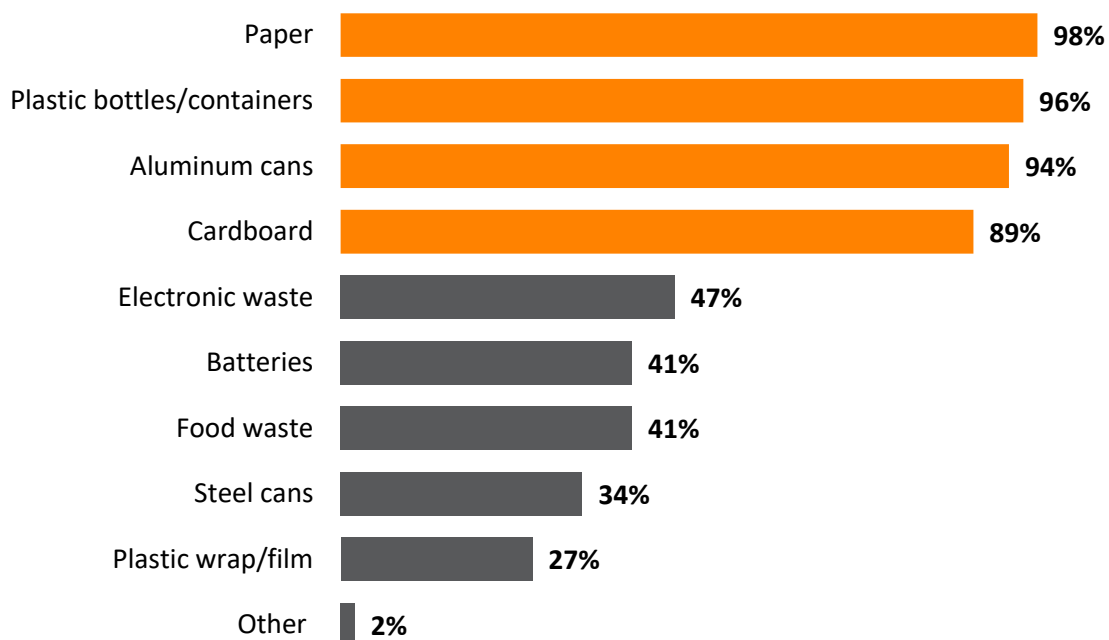


Figure 11: Participants' Awareness of What Can Be Recycled on Campus



Figure 12: Top Themes for Employees' Suggestions for Increasing Awareness of Campus Sustainability Initiatives

most common themes, including the number of participants who mentioned that theme in their response. Select participants' quotes and themes related to increasing awareness are located in Appendix E.

*"More announcements, university-wide activities, education, and incentives
[are needed to increase awareness]."*

-Survey respondent

Awareness Summary

Overall, most participants (70%) reported they were aware of the Office of Sustainability (70%), and a statistically significant relationship was found between employees' awareness of the Office of Sustainability and two demographic variables: primary role on campus and gender. Staff (81%) and women (83%) reported they were more aware of the Office of Sustainability than faculty (73%) and men (70%). No statistically significant relationship was found between employees' awareness of the Office of Sustainability and their length of employment at the university, generational status, or political beliefs. In addition, the most common ways participants reportedly learned about the Office of Sustainability were from weekly university emails about campus updates and events (25%) and seeing signs around campus (23%).

On the other hand, most participants reported they were not aware of the Campus Sustainability Master Plan (71%) or the Chancellor's goal to divert 50% of campus waste from landfills by 2030 (85%). A statistically significant relationship was found between employees' awareness of the Campus Sustainability Master Plan and length of employment at the university. Employees who have been at the university for more than 10 years are

more likely to be aware of the plan than those who have been there for less than 10 years. Results also found a statistically significant relationship between awareness of this plan and employees' generational status. Baby Boomer employees are more likely to be aware the plan than Gen X and Millennial employees.

Similarly, a statistically significant relationship was found between awareness of the Chancellor's campus waste diversion goal and employees' length of employment, generational status, and political beliefs. Employees' who have been at the university for more than 10 years, Boomers, and those with conservative beliefs are more likely to be aware of the Chancellor's goal to divert 50% of campus waste from landfills by 2030.

Participation (RQ2)

Two main survey questions were related to the second research question, which focused on understanding the extent that employees participate in campus sustainability initiatives. One question focused on their personal participation and another focused on their office or department's participation.

Personal Participation

Participants were asked to rate (1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Always) how often they participate in 11 different green workplace behaviors: 1) the Mug Project, 2) driving an electric vehicle to work, 3) placing recyclable materials in the interior recycling bins, 4) placing recyclable materials in the exterior recycling bins, 5) placing recyclable materials in trash cans, 6) turning off their work computers at the end of the day, 7) turning off their office lights at the end of the day, 8) using hand dryers instead of paper towels in the bathrooms at work, 9) using the My Tiny Trash bin, 10) using the water bottle refill stations on campus, and 11) taking alternate modes of transportation to work. Of these

11 behaviors, there were three that the majority of respondents indicated they always do: 1) turn the lights off when leaving their office at the end of the day (76%), 2) place recyclable materials in the interior recycling bins (74%), and 3) use the water bottle refill stations on campus (59%). In contrast, there were two green behaviors that most participants reported they never engage in: 1) drive an electric vehicle to work (76%) and 2) walk, bike, carpool or take public transportation to work (70%). Table 11 on the next page includes participants' mean scores and standard deviations for each of these 11 green behaviors, and the percentage of participants who indicated they always or often engage in these behaviors.

Group Differences

Three independent samples t-tests were conducted to look for differences in mean frequency of participation (1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Always) in the 11 campus sustainability initiatives between the following groups: 1) staff and faculty, 2) women and men, and 3) those employed 10 years or less and those employed more than 10 years. Additionally, one-way analyses of variance (ANOVAs) were conducted to determine if group differences in mean frequency of participation in these same campus sustainability initiatives exist among the following groups: 1) Boomers, Gen X, and Millennials, and 2) those with conservative, mixed, and liberal political beliefs. Participants also had the option to choose "not applicable" for these items and those responses were coded as missing data and excluded from the analyses.

Employee Roles

The Mug Project. An independent samples *t*-test was conducted to look for differences in participation in the Mug Project (bringing a reusable mug to receive a drink discount at participating campus businesses) between employee roles: staff and faculty.

Table 11: Participants' Frequency of Participation in Campus Sustainability Initiatives

Activity	Mean	SD	% of Participants who Often or Always Participate in Activity
Place recyclable materials in the blue or green recycling bins in my office or department	4.69	.64	93%
Turn the lights off when I leave my office	4.71	.82	84%
Use the water bottle refill stations on campus	4.25	1.19	79%
Place recyclable materials in the recycling bins outside around campus	3.92	1.31	66%
Use the My Tiny Trash bin in my office	3.84	1.57	60%
Shut down my computer at the end of the workday	3.24	1.50	44%
Bring a reusable mug to receive a drink discount at participating locations on campus (The Mug Project)	2.56	1.71	30%
Place recyclable materials in the regular grey trash bins	2.23	1.26	17%
Use hand dryers instead of paper towels after washing my hands	2.64	1.30	9%
Walk, bike, carpool, or take public transportation to work	1.53	1.10	9%
Drive an electric vehicle to work	1.28	.96	5%

Results were not statistically significant, $t(336)=-.020$, $p=.984$, with a small effect size ($d=-.002$). This indicates there is no significant difference in the frequency of participation in The Mug Project between staff ($n=233$, $M=2.56$, $SD=1.70$) and faculty ($n=105$, $M=2.56$, $SD=1.77$).

Electric Vehicle. An independent samples t -test was conducted to look for differences in driving an electric vehicle to work between staff and faculty. Results were statistically significant, $t(133)= -2.729$, $p=.007$, with a small effect size ($d=-.394$). This means there is a significant difference in the frequency of driving an electric vehicle to work between staff ($n=223$, $M=1.16$, $SD=.72$) and faculty ($n=104$, $M=1.53$, $SD=1.53$). Faculty drive an electric vehicle to work more frequently than staff.

Interior Recycling Bin. An independent samples t -test was conducted to look for differences in placing recyclable materials in the university's interior recycling bins between staff and faculty. Results were not statistically significant, $t(241)= -1.485$, $p=.139$, with a small effect size ($d=-.159$) This indicates there is no significant difference in the frequency of placing recyclable materials in campus exterior recycling bins between staff ($n=269$, $M=4.65$, $SD=.66$) and faculty ($n=119$, $M=4.76$, $SD=.61$).

Exterior Recycling Bin. An independent samples t -test was conducted to look for differences in placing recyclable materials in campus exterior recycling bins between staff and faculty. Results were not statistically significant, $t(376)=.705$, $p=.481$, with a small effect size ($d=.079$). This indicates there is no significant difference in the frequency of placing recyclable materials in campus exterior recycling bins between staff ($n=263$, $M=3.95$, $SD=1.28$) and faculty ($n=115$, $M=3.84$, $SD=1.37$).

Recyclables in Trash. An independent samples *t*-test was conducted to look for differences in placing recyclable materials in trash bins between staff and faculty. Results were not statistically significant, $t(380)=1.732$, $p=.084$, with a small effect size ($d=.192$). This indicates that there is no significant difference in the frequency of placing recyclable materials in trash bins between staff ($n=265$, $M=2.30$, $SD=1.23$) and faculty ($n=117$, $M=2.06$, $SD=1.33$).

Turn Off Computer. An independent samples *t*-test was conducted to look for differences in turning off work computers at the end of the day between staff and faculty. Results were not statistically significant, $t(376)=1.824$, $p=.069$, with a small effect size ($d=.205$). This indicates there is not a significant difference in the frequency of turning off work computers at the end of the day between staff ($n=266$, $M=3.33$, $SD=1.48$) and faculty ($n=112$, $M=3.03$, $SD=1.54$).

Turn Off Lights. An independent samples *t*-test was conducted to look for differences in turning off office lights at the end of the day between staff and faculty. Results were not statistically significant, $t(357)=-1.122$, $p=.263$, with a small effect size ($d=-.127$). This indicates there is a not a significant difference in the frequency of turning off office lights at the end of the day between staff ($n=246$, $M=4.67$, $SD=.85$) and faculty ($n=113$, $M=4.78$, $SD=.74$).

Hand Dryers. An independent samples *t*-test was conducted to look for differences in using hand dryers instead of paper towels after washing hands between staff and faculty. Results were not statistically significant, $t(392)=.657$, $p=.511$, with a small effect size ($d=.072$). This indicates there is no significant difference in the frequency of using hand

dryers instead of paper towels after washing hands between staff ($n=275$, $M=2.67$, $SD=1.33$) and faculty ($n=119$, $M=2.57$, $SD=1.25$).

My Tiny Trash. An independent samples t -test was conducted to look for differences in using a My Tiny Trash bin between staff and faculty. Results were not statistically significant, $t(346)=.764$, $p=.445$, with a small effect size ($d=.088$). This indicates there is no significant difference in frequency of using the My Tiny Trash bins between staff ($n=235$, $M=3.88$, $SD=1.55$) and faculty ($n=113$, $M=3.74$, $SD=1.62$).

Water Bottle Refill Stations. An independent samples t -test was conducted to look for differences in using the campus water bottle refill stations between staff and faculty. Results were not statistically significant, $t(382)=-.047$, $p=.963$, with a small effect size ($d=-.005$). This indicates there is no significant difference in the frequency of using the campus water bottle refill stations between staff ($n=266$, $M=4.25$, $SD=1.18$) and faculty ($n=118$, $M=4.25$, $SD=1.22$).

Alternative Transportation. An independent samples t -test was conducted to look for differences in taking alternative transportation to work (walk, bike, carpool, public transportation) between staff and faculty. Results were statistically significant, $t(193)=-1.958$, $p=.052$, with a small effect size ($d=-.235$). This indicates there is a significant difference in the frequency of taking alternative transportation to work between staff ($n=252$, $M=1.44$, $SD=1.02$) and faculty ($n=117$, $M=1.70$, $SD=1.23$). Faculty take alternative modes of transportation to work more often than staff.

Gender

The Mug Project. An independent samples t -test was conducted to look for differences in participation in the Mug Project (bringing a reusable mug to receive a drink

discount at participating campus businesses) between women and men. Results were not statistically significant, $t(312)=-.507$, $p=.613$, with a small effect size ($d=.060$). This indicates there is no significant difference in the frequency of participation in The Mug Project between women ($n=203$, $M=2.57$, $SD=1.69$) and men ($n=111$, $M=2.47$, $SD=1.78$).

Electric Vehicle. An independent samples t -test was conducted to look for differences in driving an electric vehicle to work between women and men. Results were not statistically significant, $t(303)=-.405$, $p=.686$, with a small effect size ($d=-.048$). This indicates there is no significant difference in the frequency of driving an electric vehicle to work between women ($n=197$, $M=1.26$, $SD=.96$) and men ($n=111$, $M=1.31$, $SD=.97$).

Interior Recycling Bin. An independent samples t -test was conducted to look for differences in placing recyclable materials in the university's interior recycling bins between women and men. Results were statistically significant, $t(215)= 2.304$, $p=.022$, with a medium effect size ($d=.270$). This indicates there is a significant difference in the frequency of placing recyclable materials in campus interior recycling bins between women ($n=235$, $M=4.76$, $SD=.54$) and men ($n=124$, $M=4.60$, $SD=.65$). Women place recyclable materials in the interior recycling bins more often than men.

Exterior Recycling Bin. An independent samples t -test was conducted to look for differences in placing recyclable materials in campus exterior recycling bins between women and men. Results were statistically significant, $t(350)=2.853$, $p=.005$, with a medium effect size ($d=.320$). This indicates there is a statistically significant difference in the frequency of placing recyclable materials in campus exterior recycling bins between women ($n=230$, $M=4.09$, $SD=1.25$) and men ($n=122$, $M=3.68$, $SD=1.31$). Women place recycling materials in exterior recycling bins more often than men.

Recyclables in Trash. An independent samples *t*-test was conducted to look for differences in placing recyclable materials in trash bins between women and men. Results were not statistically significant, $t(353)=-.268$, $p=.789$, with a small effect size ($d=-.030$). This indicates there is no statistically significant difference in the frequency of placing recyclable materials in trash bins between women ($n=234$, $M=2.23$, $SD=1.31$) and men ($n=121$, $M=2.26$, $SD=1.19$).

Turn Off Computer. An independent samples *t*-test was conducted to look for differences in turning off work computers at the end of the day between women and men. Results were not statistically significant, $t(350)=.438$, $p=.662$, with a small effect size ($d=.050$). This indicates there is not a statistically significant difference in the frequency of turning off work computers at the end of the day between women ($n=236$, $M=3.24$, $SD=1.45$) and men ($n=116$, $M=3.16$, $SD=1.54$).

Turn Off Lights. An independent samples *t*-test was conducted to look for differences in turning off office lights at the end of the day between women and men. Results were statistically significant, $t(183)=2.100$, $p=.037$, with a medium effect size ($d=.27$). This indicates there is a significant difference in the frequency of turning off office lights at the end of the day between women ($n=215$, $M=4.80$, $SD=.65$) and men ($n=117$, $M=4.61$, $SD=.90$). Women turn off their office lights at the end of the day more often than men.

Hand Dryers. An independent samples *t*-test was conducted to look for differences in using hand dryers instead of paper towels after washing hands between women and men. Results were not statistically significant, $t(364)=.137$, $p=.891$, with a small effect size ($d=.15$). This means there is no statistically significant difference in the frequency of using hand

dryers instead of paper towels after washing hands between women ($n=242$, $M=2.64$, $SD=1.28$) and men ($n=124$, $M=2.62$, $SD=1.32$).

My Tiny Trash. An independent samples t -test was conducted to look for differences in using a My Tiny Trash bin between women and men. Results were statistically significant, $t(200)=2.714$, $p=.007$, with a medium effect size ($d=.330$). This indicates there is a significant difference in the frequency of using the My Tiny Trash bins between women ($n=214$, $M=4.04$, $SD=1.47$) and men ($n=111$, $M=3.53$, $SD=1.66$). Women use the My Tiny Trash bin more often than men.

Water Bottle Refill Stations. An independent samples t -test was conducted to look for differences in using the campus water bottle refill stations between women and men. Results were not statistically significant, $t(354)=.246$, $p=.806$, with a small effect size ($d=.027$). This means there is no statistically significant difference in the frequency of using the campus water bottle refill stations between women ($n=234$, $M=4.28$, $SD=1.20$) and men ($n=122$, $M=4.25$, $SD=1.09$).

Alternative Transportation. An independent samples t -test was conducted to look for differences in taking alternative transportation to work (walk, bike, carpool, public transportation) between women and men. Results were not statistically significant, $t(343)=-.834$, $p=.405$, with a small effect size ($d=-.094$). This indicates there is no statistically significant difference in the frequency of taking alternative transportation to work between women ($n=225$, $M=1.49$, $SD=1.03$) and men ($n=120$, $M=1.59$, $SD=1.19$).

Length of Employment

The Mug Project. An independent samples t -test was conducted to look for differences in participation in the Mug Project (bringing a reusable mug to receive a drink

discount at participating campus businesses) between employees who've worked at the university for 10 years or less and those employed more than 10 years. Results were not statistically significant, $t(329)=.426$, $p=.671$, with a small effect size ($d=.049$). This indicates there is no statistically significant difference in the frequency of participation in The Mug Project between those who've worked on campus for 10 years or less ($n=215$, $M=2.56$, $SD=1.68$) and more than 10 years ($n=116$, $M=2.47$, $SD=1.77$).

Electric Vehicle. An independent samples t -test was conducted to look for differences in driving an electric vehicle to work between those who've worked at the university for 10 years or less and those who've worked for more than 10 years. Results were not statistically significant, $t(318)=.250$, $p=.803$, with a small effect size ($d=.029$). This indicates there is no significant difference in the frequency of driving an electric vehicle to work between those who've worked on campus for 10 years or less ($n=197$, $M=1.28$, $SD=.96$) and more than 10 years ($n=123$, $M=1.25$, $SD=.93$).

Interior Recycling Bin. An independent samples t -test was conducted to look for differences in placing recyclable materials in the university's interior recycling bins between those who've worked at the university for 10 years or less and those who've worked for more than 10 years. Results were not statistically significant, $t(291)= -1.305$, $p=.193$, with a small effect size ($d=-.137$). This indicates there is not a significant difference in frequency of placing recyclable materials in campus interior recycling bins between those who've worked on campus for 10 years or less ($n=246$, $M=4.66$, $SD=.66$) and more than 10 years ($n=134$, $M=4.75$, $SD=.61$).

Exterior Recycling Bins. An independent samples t -test was conducted to look for differences in placing recyclable materials in campus exterior recycling bins between those

who've worked at the university for 10 years or less and those who've worked for more than 10 years. Results were not statistically significant, $t(369) = -.923$, $p = .357$, with a small effect size ($d = -.100$). This indicates there is no statistically significant difference in the frequency of placing recyclable materials in campus exterior recycling bins between those who've worked on campus for 10 years or less ($n = 241$, $M = 3.88$, $SD = 1.32$) and more than 10 years ($n = 130$, $M = 4.01$, $SD = 1.30$).

Recyclables in Trash. An independent samples t -test was conducted to look for differences in placing recyclable materials in trash bins between those who've worked at the university for 10 years or less and those who've worked for more than 10 years. Results were not statistically significant, $t(372) = 1.129$, $p = .260$, with a small effect size ($d = .122$). This indicates there is no statistically significant difference in the frequency of placing recyclable materials in trash bins between those who've worked 10 years or less ($n = 241$, $M = 2.27$, $SD = 1.28$) and more than 10 years ($n = 133$, $M = 2.12$, $SD = 1.23$).

Turn Off Computer. An independent samples t -test was conducted to look for differences in turning off work computers at the end of the day between those who've worked at the university for 10 years or less and those who've worked for more than 10 years. Results were not statistically significant, $t(368) = -.177$, $p = .860$, with a small effect size ($d = -.019$). This indicates there is no statistically significant difference in the frequency of turning off work computers at the end of the day between those who've worked on campus for 10 years or less ($n = 237$, $M = 3.22$, $SD = 1.46$) and those who've worked more than 10 years ($n = 133$, $M = 3.25$, $SD = 1.57$).

Turn Off Lights. An independent samples t -test was conducted to look for differences in turning off office lights at the end of the day between those who've worked at the

university for 10 years or less and those who've worked for more than 10 years. Results were not statistically significant, $t(349)=-.815$, $p=.416$, with a small effect size ($d=-.092$). This indicates there is no statistically significant difference in the frequency of turning off office lights at the end of the day between those who've worked 10 years or less ($n=234$, $M=4.70$, $SD=.83$) and those who've worked more than 10 years ($n=117$, $M=4.77$, $SD=.70$).

Hand Dryers. An independent samples t -test was conducted to look for differences in using hand dryers instead of paper towels after washing hands between those who've worked at the university for 10 years or less and those who've worked for more than 10 years. Results were not statistically significant $t(383)= 1.166$, $p=.244$, with a small effect size ($d=.124$). This indicates there is no statistically significant difference in the frequency of using hand dryers instead of paper towels after washing hands between those who've worked 10 years or less ($n=242$, $M=2.64$, $SD=1.28$) and more than 10 years ($n=136$, $M=2.54$, $SD=1.34$).

My Tiny Trash. An independent samples t -test was conducted to look for differences in using a My Tiny Trash bin between those who've worked at the university for 10 years or less and those who've worked for more than 10 years. Results were statistically significant, $t(222)=1.962$, $p=.051$, with a small effect size ($d=.231$). This indicates there is a significant difference in the frequency of using the My Tiny Trash bins between those who've worked 10 years or less ($n=220$, $M=3.98$, $SD=1.47$) and more than 10 years ($n=122$, $M=3.62$, $SD=1.70$). Those who've worked at the university 10 years or less use the My Tiny Trash bin more often than those who've worked at the university for more than 10 years.

Water Bottle Refill Stations. An independent samples t -test was conducted to look for differences in using the campus water refill stations between those who've worked at the

university for 10 years or less and those who've worked for more than 10 years. Results were statistically significant, $t(211)=3.570$, $p<.001$, with a medium effect size ($d=.419$). This indicates there is a significant difference in the frequency of using campus water bottle refill stations between those who've worked 10 years or less ($n=247$, $M=4.43$, $SD=1.04$) and more than 10 years ($n=130$, $M=3.94$, $SD=1.36$). Those who've worked at the university 10 years or less use the water bottle refill stations more often than those who've worked at the university for more than 10 years.

Alternative Transportation. An independent samples t -test was conducted to look for differences in taking alternative transportation to work (walk, bike, carpool, public transportation) between those who've worked at the university for 10 years or less and those who've worked for more than 10 years. Results were not statistically significant, $t(311)=1.345$, $p=.180$, with a small effect size ($d=.140$). This indicates there is not a significant difference in the frequency of taking alternative transportation to work between those who've worked at the university 10 years or less ($n=233$, $M=1.58$, $SD=1.16$) and more than 10 years ($n=130$, $M=1.42$, $SD=.96$).

Generational Status

Since the number of respondents from the Silent Generation ($n=1$) and Generation Z ($n=8$) were small, these generations were excluded from statistical analyses. The following analyses of differences between generational status and participation in campus sustainability initiatives include only Boomer, Gen X, and Millennial respondents.

The Mug Project. A one-way between subjects ANOVA was conducted to look for differences in participation in the Mug Project between three different generation groups (Boomers, Gen X, Millennials). The Levene's test for equality of variances was found to be

violated for this analysis. A Welch's test revealed there was not a statistically significant difference in the frequency of participation in The Mug Project between generations, Welch's $F(2, 178)=.270$, $p=.764$, with a small effect size ($\eta=.002$). This means that there are no significant differences in the frequency of participation in The Mug Project between Boomers ($n=72$, $M=2.60$, $SD=1.85$), Gen X ($n=131$, $M=2.60$, $SD=1.74$), or Millennials ($n=117$, $M=2.45$, $SD=1.61$).

Electric Vehicle. A one-way between subjects ANOVA was conducted to look for differences in driving an electric vehicle to work between three different generation groups (Boomers, Gen X, Millennials). Results were not statistically significant, $F(2, 304)=.062$, $p=.939$ with a small effect size ($\eta=.000$). This means that there are no significant differences in frequency of driving an electric vehicle to work between Boomers ($n=77$, $M=1.27$, $SD=.97$), Gen X ($n=122$, $M=1.30$, $SD=1.02$), or Millennials ($n=108$, $M=1.26$, $SD=.90$).

Interior Recycling Bin. A one-way between subjects ANOVA was conducted to look for differences in placing recyclable materials in the campus interior recycling bins between three different generation groups (Boomers, Gen X, Millennials). The Levene's test for equality of variances was found to be violated for this analysis. A Welch's test revealed there was not a statistically significant difference in the frequency of placing recyclable materials in the interior recycling bins between generations, Welch's $F(2, 223)=1.695$, $p=.186$, with a small effect size ($\eta=.007$). This means that there are no significant differences in the frequency of placing recyclable materials in the campus interior recycling bins between Boomers ($n=83$, $M=4.80$, $SD=.49$), Gen X ($n=148$, $M=4.66$, $SD=.73$), or Millennials ($n=134$, $M=4.69$, $SD=.53$).

Exterior Recycling Bins. A one-way between subjects ANOVA was conducted to look for differences in placing recyclable materials in the campus exterior recycling bins between three different generation groups (Boomers, Gen X, Millennials). The Levene's test for equality of variances was found to be violated for this analysis. A Welch's test revealed there was a statistically significant difference in the frequency of placing recyclable materials in the exterior recycling bins between generations, Welch's $F(2, 201)=3.600, p=.029$, with a small effect size ($\eta=.021$). This means that there is a significant difference in the frequency of placing recyclable materials in the campus exterior recycling bins between Boomers ($n=81, M=4.01, SD=1.30$), Gen X ($n=148, M=4.08, SD=1.19$), and Millennials ($n=128, M=3.66, SD=1.41$). A Tukey post-hoc test showed that Gen X places recyclable materials in the campus exterior recycling bins more often than Millennials ($p=.022$). There were no significant differences found between Boomers and Gen X ($p=.922$) and Boomers and Millennials ($p=.143$).

Recyclables in Trash. A one-way between subjects ANOVA was conducted to look for differences in placing recyclable materials in the trash between three different generation groups (Boomers, Gen X, Millennials). The Levene's test for equality of variances was found to be violated for this analysis. A Welch's test revealed there was not a statistically significant difference in the frequency of placing recyclable materials in trash cans between generations, Welch's $F(2, 197)=.957, p=.386$, with a small effect size ($\eta=.005$). This means that there are no significant differences in the frequency of placing recyclable materials in the trash cans between Baby Boomers ($n=80, M=2.28, SD=1.39$), Gen X ($n=146, M=2.32, SD=1.36$), or Millennials ($n=134, M=2.13, SD=1.10$).

Turn Off Computer. A one-way between subjects ANOVA was conducted to look for differences in shutting down work computers at the end of the day between three different generation groups (Boomers, Gen X, Millennials). Results were not statistically significant, $F(2, 353)=.735, p=.480$, with a small effect size ($\eta=.004$). This means that there are no significant differences in the frequency of shutting down work computers at the end of the day between Boomers ($n=82, M=3.22, SD=1.60$), Gen X ($n=146, M=3.32, SD=1.53$), or Millennials ($n=128, M=3.10, SD=1.40$).

Turn Off Lights. A one-way between subjects ANOVA was conducted to look for differences in turning off office lights at the end of the day between three different generation groups (Boomers, Gen X, Millennials). Results were not statistically significant, $F(2, 335)=.527, p=.591$, with a small effect size ($\eta=.003$). This means that there are no significant differences in the frequency of turning off office lights at the end of the day between Boomers ($n=72, M=4.74, SD=.81$), Gen X ($n=143, M=4.69, SD=.86$), or Millennials ($n=123, M=4.79, SD=.60$).

Hand Dryers. A one-way between subjects ANOVA was conducted to look for differences in using hand dryers instead of paper towels in the bathrooms at work between three different generation groups (Boomers, Gen X, Millennials). Results were not statistically significant, $F(2, 368)=.192, p=.826$, with a small effect size ($\eta=.001$). This means that there are no significant differences in the frequency of using hand dryers instead of paper towels in the bathrooms at work between Boomers ($n=84, M=2.62, SD=1.28$), Gen X ($n=150, M=2.72, SD=1.37$), or Millennials ($n=137, M=2.65, SD=1.23$).

My Tiny Trash. A one-way between subjects ANOVA was conducted to look for differences in the use of the My Tiny Trash bin between three different generation groups

(Boomers, Gen X, Millennials). The Levene's test for equality of variances was found to be violated for this analysis. A Welch's test revealed there was not a statistically significant difference in the frequency of placing recyclable materials in trash cans between generations, Welch's $F(2, 184)=2.860$, $p=.060$, with a small effect size ($\eta=.020$). This means that there is not a significant difference in the frequency of using the My Tiny Trash bin between Boomers ($n=76$, $M=3.47$, $SD=1.75$), Gen X ($n=131$, $M=3.97$, $SD=1.56$), and Millennials ($n=124$, $M=4.02$, $SD=1.41$).

Water Bottle Refill Stations. A one-way between subjects ANOVA was conducted to look for differences in the use of the campus water bottle refill stations between three different generation groups (Boomers, Gen X, Millennials). The Levene's test for equality of variances was found to be violated for this analysis. A Welch's test revealed there was a statistically significant difference in using the water bottle refill stations on campus between generations, Welch's $F(2, 191)=10.287$, $p<.001$, with a small effect size ($\eta=.045$). This means that there is a significant difference in the frequency of using the water bottle refills stations on campus between Boomers ($n=81$, $M=4.04$, $SD=1.26$), Gen X ($n=147$, $M=4.12$, $SD=1.29$), and Millennials ($n=134$, $M=4.59$, $SD=.83$). A Tukey post-hoc test showed that Millennials use the water bottle refill stations more often than both Gen X ($p=.002$) and Boomers ($p=.002$). There was no statistically significant difference in water bottle refill station usage between Boomers and Gen X ($p=.871$).

Alternative Transportation. A one-way between subjects ANOVA was conducted to look for differences in taking alternate transportation to work between three different generation groups (Boomers, Gen X, Millennials). The Levene's test for equality of variances was found to be violated for this analysis. A Welch's test revealed there was no statistically

significant difference in the frequency of using alternative modes of transportation to work between generations, Welch's $F(2, 220)=2.318, p=.101$, with a small effect size ($\eta=.011$). This means that there is not a significant difference in the frequency of taking alternative modes of transportation to work between Boomers ($n=82, M=1.33, SD=.86$), Gen X ($n=138, M=1.53, SD=1.10$), and Millennials ($n=130, M=1.62, SD=1.19$).

Political Beliefs

The Mug Project. A one-way between subjects ANOVA was conducted to look for differences in participation in the Mug Project between three different political belief groups (conservative, mixed, liberal). Results were not statistically significant, $F(2, 285)=1.506, p=.224$, with a small effect size ($\eta=.010$). This means that there are no significant differences in the frequency of participation in the Mug Project between employees with conservative beliefs ($n=48, M=2.31, SD=1.69$), mixed beliefs, ($n=60, M=1.82, SD=1.94$), or liberal beliefs ($n=180, M=2.51, SD=1.70$).

Electric Vehicle. A one-way between subjects ANOVA was conducted to look for differences in driving an electric vehicle to work between three different political belief groups (conservative, mixed, liberal). The Levene's test for equality of variances was found to be violated for this analysis.³ Results were statistically significant indicating there are differences in driving an electric vehicle to work between political groups, $F(2, 278)=3.863, p=.022$, with a medium effect size ($\eta=.027$), indicating there are significant differences in the frequency of driving an electric vehicle to work between those with conservative beliefs ($n=48, M=1.00, SD=.00$), mixed beliefs, ($n=57, M=1.16, SD=.75$), and liberal beliefs ($n=176, M=1.40, SD=1.13$). A Tukey post-hoc test showed that those with liberal beliefs drive an

³ A Welch's test was not able to be performed in SPSS.

electric vehicle to work more frequently than those with conservative beliefs ($p=.030$). There are no statistically significant differences in the frequency of driving an electric vehicle to work between employees with liberal and mixed beliefs ($p=.228$) and those with conservative and mixed beliefs ($p=.676$).

Interior Recycling Bin. A one-way between subjects ANOVA was conducted to look for differences in placing recyclable materials in interior recycling bins between three different political belief groups (conservative, mixed, liberal). The Levene's test for equality of variances was found to be violated for this analysis. A Welch's test revealed there was not a statistically significant difference in the frequency of placing recyclable materials in interior recycling bins between those with different political beliefs, Welch's $F(2, 100)=2.484, p=.089$, with a small effect size ($\eta=.017$). This means that there are no significant differences in the frequency of placing recyclable materials in interior recycling bins between those with conservative beliefs ($n=52, M=4.58, SD=.67$), mixed beliefs, ($n=65, M=4.62, SD=.70$), and liberal beliefs ($n=210, M=4.76, SD=.56$).

Exterior Recycling Bins. A one-way between subjects ANOVA was conducted to look for differences in placing recyclable materials in exterior recycling bins between three different political belief groups (conservative, mixed, liberal). Results were not statistically significant, $F(2, 317)=.168, p=.845$, with a small effect size ($\eta=.001$). This means that there are no significant differences in frequency of placing recyclable materials in exterior recycling bins between those with conservative beliefs ($n=50, M=3.84, SD=1.23$), mixed beliefs, ($n=64, M=3.98, SD=1.35$), and liberal beliefs ($n=206, M=3.91, SD=1.33$).

Recyclables in Trash. A one-way between subjects ANOVA was conducted to look for differences in placing recyclable materials in trash cans between three different political

belief groups (conservative, mixed, liberal). Results were not statistically significant, $F(2, 321)=2.232, p=.109$, with a small effect size ($\eta=.014$). This means that there are no significant differences in frequency of placing recyclable materials in trash cans between employees with conservative beliefs ($n=51, M=2.39, SD=1.31$), mixed beliefs, ($n=64, M=2.30, SD=1.19$), and liberal beliefs ($n=209, M=2.05, SD=1.19$).

Turn Off Computer. A one-way between subjects ANOVA was conducted to look for differences in turning off work computers at the end of the day between three different political belief groups (conservative, mixed, liberal). Results were not statistically significant, $F(2,316)=.002, p=.998$, with a small effect size ($\eta=.000$). This means that there are no significant differences in the frequency of turning off work computers at the end of day between employees with conservative beliefs ($n=51, M=3.18, SD=1.57$), mixed beliefs, ($n=63, M=3.16, SD=1.52$), and liberal beliefs ($n=205, M=3.17, SD=1.50$).

Turn Off Lights. A one-way between subjects ANOVA was conducted to look for differences in turning off office lights at the end of the day between three different political belief groups (conservative, mixed, liberal). Results were not statistically significant, $F(2,303)=.225, p=.799$, with a small effect size ($\eta=.001$). This means that there are no significant differences in the frequency of turning off office lights at the end of the day between employees with conservative beliefs ($n=50, M=4.68, SD=1.98$), mixed beliefs, ($n=62, M=3.95, SD=1.52$), or liberal beliefs ($n=189, M=3.97, SD=1.50$).

Hand Dryers. A one-way between subjects ANOVA was conducted to look for differences in using hand dryers instead of paper towels in the bathrooms at work between three different political belief groups (conservative, mixed, liberal). Results were not statistically significant, $F(2, 331)=1.601, p=.203$, with a small effect size ($\eta=.010$). This means

that there are no significant differences in the frequency of using hand dryers instead of paper towels in the bathrooms at work between employees with conservative beliefs ($n=51$, $M=2.67$, $SD=1.39$), mixed beliefs, ($n=65$, $M=2.74$, $SD=1.16$), and liberal beliefs ($n=218$, $M=2.72$, $SD=1.31$).

My Tiny Trash. A one-way between subjects ANOVA was conducted to look for differences in usage of the My Tiny Trash bin between three different political belief groups (conservative, mixed, liberal). Results were not statistically significant, $F(2, 294)=1.811$, $p=.165$, with a small effect size ($\eta=.012$). This means that there are no significant differences in the frequency of using the My Tiny Trash bin between employees with conservative beliefs ($n=46$, $M=3.50$, $SD=1.70$), mixed beliefs, ($n=62$, $M=3.95$, $SD=1.52$), and liberal beliefs ($n=189$, $M=3.97$, $SD=1.50$).

Water Bottle Refill Stations. A one-way between subjects ANOVA was conducted to look for differences in usage of the water bottle refill stations on campus between three different political belief groups (conservative, mixed, liberal). Results were not statistically significant, $F(2, 322)=1.576$, $p=.208$, with a small effect size ($\eta=.010$). This means that there are no significant differences in the frequency of using the water bottle refill stations on campus between employees with conservative beliefs ($n=48$, $M=4.10$, $SD=1.17$), mixed beliefs, ($n=65$, $M=4.08$, $SD=1.34$), or liberal beliefs ($n=212$, $M=4.33$, $SD=1.12$).

Alternative Transportation. A one-way between subjects ANOVA was conducted to look for differences in taking alternate modes of transportation to work between three different political belief groups (conservative, mixed, liberal). The Levene's test for equality of variances was found to be violated for this analysis. A Welch's test revealed a statistically significant difference in the frequency of taking alternative modes of transportation to work

between employees with different political beliefs, Welch's $F(2, 118)=4.663$ $p=.011$, with a small effect size ($\eta=.021$). This means that there are significant differences in the frequency of taking alternate modes of transportation to work between employees with conservative beliefs ($n=49$, $M=1.20$, $SD=.82$), mixed beliefs, ($n=60$, $M=1.43$, $SD=.95$), and liberal beliefs ($n=205$, $M=1.64$, $SD=1.20$). A Tukey post-hoc test showed that employees with liberal beliefs take alternative modes of transportation to work more frequently than those with conservative beliefs ($p=.036$). There were no statistically significant differences found in the frequency of taking alternative modes of transportation to work between employees with liberal and mixed beliefs ($p=.411$) and those with conservative and mixed beliefs ($p=.525$).

Office Participation

Participants were also asked to select from a list the sustainability initiatives their office or department participates in, and options included: 1) recycling, 2) composting, 3) My Tiny Trash, 4) Green Office Program, 5) zero Waste Events, 6) other, 7) unsure, and 8) none. Figure 13 on the next page shows the percentage of all participants that selected each of these options. For those who selected other, one participant mentioned recycling scenery (possibly meaning landscaping materials), and another mentioned the water bottle refill stations.

Participation Summary

Regarding personal participation in green behaviors at work, the majority of participants reported they always engaged in three behaviors: 1) turn off office lights at the end of the day (76%), 2) place recyclable materials in the interior recycling bins (74%), and 3) use the water bottle refill stations (59%). In contrast, there were two green behaviors that

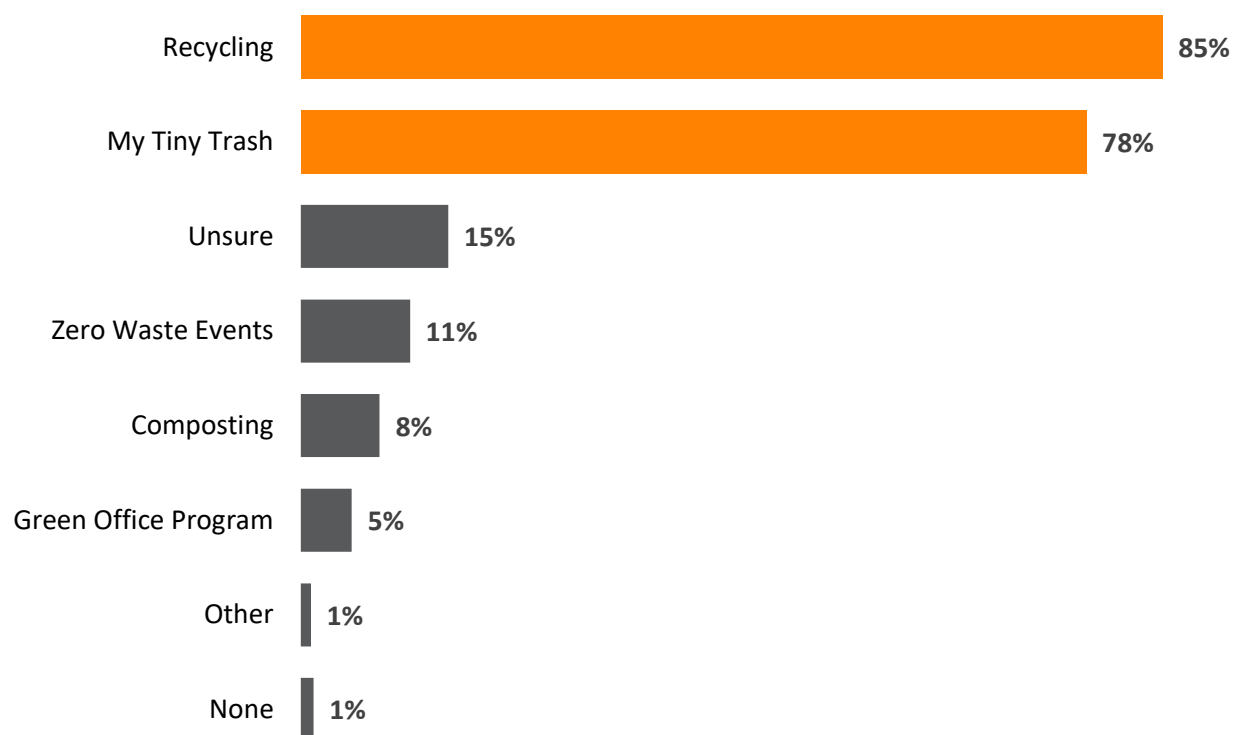


Figure 13: Participants' Office & Department Sustainability Initiative Participation Rates

most respondents reported they never do: 1) drive an electric vehicle to work (76%) and 2) carpool or take alternative modes of transportation to work (70%).

Furthermore, several statistically significant relationships were found between personal participation in green workplace behaviors and different demographic groups. Faculty drive electric vehicles and carpool or take alternative modes of transportation to work more often than staff. Results indicated that women employees engage in the following green workplace behaviors more often than men: 1) place recyclable materials in the interior recycling bins, 2) place recyclable materials in the exterior recycling bins, 3) turn off their office lights at the end of the day, and 4) use the My Tiny Trash bin in their offices. Employees who have been working at the university 10 years or less engage in two green workplace behaviors more often than employees who have worked there for more than 10 years: 1) use the My Tiny Trash bin in their offices, and 2) use the water bottle refill stations.

In addition, Gen X employees use the exterior recycling bins more often than Millennials and Millennials use the water bottle refill stations more often than Gen X and Boomers. Results also show that employees with liberal political beliefs drive electric vehicles and carpool or take alternative modes of transportation to work more often than those with conservative beliefs.

The final section of the participation questions focused on office level participation. Survey results show that the most common campus sustainability initiatives that participants' offices engage in are recycling (85%) and My Tiny Trash (78%). Low participation rates were reported for composting, the Green Office Program, and Zero Waste Events. At least 15% of respondents reported they were unsure of which campus sustainability initiatives their office participated.

Motivation (RQ3)

The third research question focused on understanding what motivates university employees to engage or participate in green behaviors at work and three survey questions were linked to this research question. The first related question focused on supervisor or department leadership motivation, the second focused on coworker motivation, and the third was an open-ended question asking about motivation.

Supervisor Motivation

Participants were asked if they would be motivated to participate in green behaviors at work if their supervisor or departmental leadership encouraged or promoted participation in these behaviors. Answer choices included: 1=Strongly disagree, 2=Somewhat disagree, 3=Unsure, 4=Somewhat agree, and 5=Strongly agree. Most respondents either strongly agreed (32%) or somewhat agreed (36%) that they would be motivated to participate in green behaviors at work if it was promoted or encouraged by their supervisors or department leadership.

Group Differences

Three independent samples *t*-tests were conducted to look for differences in agreement with this statement between the following groups: 1) staff and faculty, 2) those employed 10 years or less and those employed more than 10 years), and 3) women and men. Additionally, analyses of variance (ANOVAs) were conducted to determine if group differences existed between the following groups: 1) Boomers, Gen X, and Millennials, and 2) those with conservative political beliefs, mixed political beliefs, and liberal political beliefs

Employee Roles

An independent samples *t*-test was conducted to look for differences in motivation to participate in green workplace behaviors by a supervisor between staff and faculty. Results were not statistically significant, $t(199)=1.247$, $p=.214$ with a small effect size ($d=.144$). This indicates there is no significant difference in being motivated to participate in green workplace behaviors by a supervisor or departmental leadership between staff ($n=276$, $M=3.85$, $SD=1.11$) and faculty ($n=119$, $M=3.68$, $SD=1.27$).

Gender

An independent samples *t*-test was conducted to look for differences in motivation to participate in green workplace behaviors by a supervisor between women and men. Results were statistically significant, $t(229)= 3.241$, $p=.001$, with a medium effect size ($d=.370$). This indicates there is a significant difference in being motivated to participate in green workplace behaviors by a supervisor or departmental leadership between women ($n=241$, $M=3.98$, $SD=1.06$) and men ($n=125$, $M=3.58$, $SD=1.18$). Women have stronger levels of agreement than men that they would be motivated to participate in green workplace behaviors if encouraged by their supervisors or department leadership.

Length of Employment

An independent samples *t*-test was conducted to look for differences in motivation to participate in green workplace behaviors by a supervisor or departmental leadership between employees who've worked at the university for 10 years or less and those who've worked for more than 10 years. Results were not statistically significant, $t(249)= 1.908$, $p=.058$, with a small effect size ($d=.211$). This indicates there is not a significant difference in being motivated to participate in green workplace behaviors by a supervisor or

departmental leadership between those who've worked on campus for 10 years or less ($n=251$, $M=3.90$, $SD=1.10$) and more than 10 years ($n=135$, $M=3.66$, $SD=1.23$).

Generational Status

A one-way between subjects ANOVA was conducted to look for differences in motivation to participate in green workplace behaviors by a supervisor or departmental leadership between three generations (Boomers, Gen X, Millennials). The Levene's test for equality of variances was found to be violated for this analysis. A Welch's test revealed there is a statistically significant difference in being motivated to participate in green workplace behaviors by a supervisor or departmental leadership between different generations, Welch's $F(2, 207)=3.501$, $p=.032$, with a small effect size ($\eta=.019$). This indicates there are significant differences in being motivated to participate in green workplace behaviors by a supervisor or departmental leadership between Boomers ($n=83$, $M=3.58$, $SD=1.18$), Gen X ($n=151$, $M=3.85$, $SD=1.15$), and Millennials ($n=137$, $M=3.99$, $SD=1.03$). A Tukey post-hoc test showed that there is a significant difference in motivation between Millennials and Boomers ($p=.021$). Millennials have stronger levels of agreement than Boomers that they would be motivated to participate in green workplace behaviors if these behaviors were encouraged or promoted by their supervisors or departmental leadership. There were no significant differences in motivation by supervisors between Boomers and Gen X ($p=.165$) and Gen X and Millennials ($p=.542$).

Political Beliefs

A one-way between subjects ANOVA was conducted to look for differences in motivation to participate in green workplace behaviors by a supervisor or departmental leadership between those with different political beliefs (conservative beliefs, mixed beliefs,

liberal beliefs). The Levene's test for equality of variances was found to be violated for this analysis. A Welch's test revealed there was a statistically significant difference in being motivated to participate in green workplace behaviors by a supervisor or departmental leadership between those with different political beliefs, Welch's $F(2, 102) = 10.040, p < .001$, with a small effect size ($\eta = .059$). This indicates there are significant differences in being motivated to participate in green workplace behaviors by a supervisor or departmental leadership between those with conservative beliefs ($n=52, M=3.35, SD=1.12$), mixed beliefs ($n=65, M=3.63, SD=1.26$), and liberal beliefs ($n=218, M=4.05, SD=1.04$). A Tukey post-hoc test showed that there are significant differences in motivation between employees with conservative and liberal beliefs ($p < .001$) and those with mixed and liberal beliefs ($p = .020$). Employees with liberal beliefs have stronger levels of agreement than those with conservative beliefs and mixed beliefs that they would be motivated to participate in green workplace behaviors if such behaviors were encouraged or promoted by their supervisors or departmental leadership. There was no significant difference in motivation from a supervisor between employees with conservative and mixed beliefs ($p = .347$).

Coworker Motivation

Participants were also asked if they would be motivated to participate in green workplace behaviors if they observed their coworkers participating in these behaviors. Answer choices included: 1=Strongly disagree, 2=Somewhat disagree, 3=Unsure, 4=Somewhat agree, and 5=Strongly agree. Most respondents either strongly agreed (31%) or somewhat agreed (40%) that they would be motivated to participate in green behaviors at work if they observed their coworkers engaging in these behaviors.

Group Differences

Three independent samples *t*-tests were conducted to look for differences in agreement with this statement between the following groups: 1) staff and faculty, 2) those employed 10 years or less and those employed more than 10 years), and 3) women and men. Additionally, one-way analyses of variance (ANOVAs) were conducted to determine if group differences in agreement with this statement existed between the following groups: 1) Boomers, Gen X, and Millennials, and 2) those with conservative, mixed, and liberal political beliefs.

Employee Roles

An independent samples *t*-test was conducted to look for differences in motivation to participate in green workplace behaviors by coworkers between staff and faculty. Results were not statistically significant, $t(197) = 1.140, p = .256$, with a small effect size ($d = .133$). This indicates there is not a significant difference in being motivated to participate in green workplace behaviors by coworkers between staff ($n = 276, M = 3.89, SD = 1.20$) and faculty ($n = 119, M = 3.75, SD = 1.20$).

Gender

An independent samples *t*-test was conducted to look for differences in motivation to participate in green workplace behaviors by coworkers between women and men. Results were statistically significant, $t(222) = 3.101, p = .002$, with a medium effect size ($d = .357$). This indicates there is a significant difference in being motivated to participate in green workplace behaviors by coworkers between women ($n = 241, M = 4.02, SD = .97$) and men ($n = 125, M = 3.66, SD = 1.12$). Women have stronger levels of agreement than men that they

would be motivated to participate in green workplace behaviors if they saw their coworkers participating in these behaviors.

Length of Employment

An independent samples *t*-test was conducted to look for differences in motivation to participate in green workplace behaviors by coworkers between those who've worked at the university for 10 years or less and those who've worked for more than 10 years. Results were statistically significant, $t(251)=2.724$, $p=.007$, with a medium effect size ($d=.300$). This indicates there is a significant difference in being motivated to participate in green workplace behaviors by a coworker between employees who've worked on campus for 10 years or less ($n=251$, $M=3.98$, $SD=1.02$) and more than 10 years ($n=135$, $M=3.66$, $SD=1.13$). Employees who've worked at the university for 10 years or less have stronger levels of agreement than those who have worked at the university for more than 10 years that they would be motivated to participate in green workplace behaviors if they observed their coworkers participating in these behaviors.

Generational Status

A one-way between subjects ANOVA was conducted to look for differences in motivation to participate in green workplace behaviors by a coworker between three generations (Boomers, Gen X, Millennials). The Levene's test for equality of variances was found to be violated for this analysis. A Welch's test revealed there is a statistically significant difference in being motivated to participate in green workplace behaviors by a coworker between those with different political beliefs, Welch's $F(2, 204)=5.198$, $p=.006$, with a small effect size ($\eta=.029$). This indicates there are significant differences in being motivated to participate in green workplace behaviors from observing coworkers between

Boomers ($n=83$, $M=3.30$, $SD=1.13$), Gen X ($n=151$, $M=3.91$, $SD=1.05$), and Millennials ($n=137$, $M=4.07$, and $SD=1.03$). A Tukey post-hoc test showed that there is a significant difference in motivation between Millennials and Boomers ($p=.003$). Millennials have stronger levels of agreement than Boomers that they would be motivated to participate in green behaviors at work if they observed their coworkers engaging in these behaviors. There were no significant differences found in coworker motivation between Boomers and Gen X ($p=.066$) and Gen X and Millennials ($p=.382$).

Political Beliefs

A one-way between subjects ANOVA was conducted to look for differences in motivation to participate in green workplace behaviors by observing a coworker engaging in these behaviors between those with different political beliefs (conservative beliefs, mixed beliefs, liberal beliefs). Results were statistically significant $F(2, 332)=10.058$, $p<.001$, with a small effect size ($\eta=.057$). This indicates there are significant differences in being motivated to participate in green workplace behaviors by observing a coworker engage in these behaviors between employees with conservative beliefs ($n=52$, $M=3.44$, $SD=1.04$), mixed beliefs ($n=65$, $M=3.78$, $SD=1.05$), and liberal beliefs ($n=218$, $M=4.10$, and $SD=.97$). A Tukey post-hoc test showed that there are significant differences in coworker motivation between employees with conservative and liberal beliefs ($p<.001$). Employees with liberal beliefs have stronger levels of agreement than those with conservative beliefs that they would be motivated to participate in green behaviors in the workplace if they saw their coworkers engaging in green behaviors. There was no significant difference found in motivation by a coworker between those with conservative and mixed beliefs ($p=.158$) and those with mixed and liberal beliefs ($p=.066$).

Other Motivation

Participants were also asked to describe what would motivate them to participate in more green behaviors at work. Approximately 50% of respondents answered this question. A thematic analysis of responses was conducted, and overarching themes were identified. The top three themes included 1) easy access/convenience, 2) more education/awareness, and 3) incentives. Select participants' quotes with related motivation themes are located in Appendix G.

"I think knowledge of alternate options is the most important as a motivation for people to change or buy into green behaviors. If they think it is impossible or difficult, they won't do it. Showing easy ways to be more sustainable would go a long way."

-Survey respondent

Motivation Summary

Most survey respondents (68%) agreed they would be motivated to engage in green behaviors at work if these behaviors were encouraged or promoted by their supervisors or departmental leadership. Results showed statistically significant differences in motivation by supervisors among three demographic variables: gender, generational status, and political beliefs. Women employees are more likely than men to agree they would be motivated by their supervisors or departmental leadership to engage in green workplace behaviors. Millennial employees are more likely than Boomers to be motivated by supervisors or departmental leadership. Liberal employees are more likely than both conservative employees and employees with mixed political beliefs to be motivated to

engage in green workplace behaviors if encouraged by their supervisor or department leadership.

Moreover, slightly more respondents (71%) agreed they would be motivated to participate in green behaviors at work if they observed their coworkers engaging in these behaviors. Results showed statistically significant differences in motivation by coworkers among four demographic variables: gender, length of employment, generational status, and political beliefs. Again, women employees are more likely than men to agree they would be motivated to engage in green behaviors at work if they observed their coworkers participating in these behaviors. Employees who have been at the university for 10 years or less are more likely than those who've been there for more than 10 years to agree that they would be motivated to participate by coworkers. Millennial employees are more likely than Boomer employees to agree they would be motivated to engage in green workplace behaviors if they observed their coworkers engaging in such behaviors. Liberal employees are more likely than conservative employees to agree they would be motivated to engage in green workplace behaviors if their coworkers are also engaging in these behaviors.

Lastly, participants provided feedback through open-ended responses about what they thought would help motivate employees to engage in green workplace behaviors. A thematic analysis of these responses revealed several themes. The top three themes were easy access/convenience, more education/awareness, and incentives.

Barriers (RQ4)

Four survey questions focused on research question four, which sought to better understand any potential barriers prohibiting employees from participating in green

behaviors in the workplace. These questions focused on specific barriers to recycling, composting, conserving energy, and additional barriers identified by employees.

Recycling

Participants were asked to select from a list of barriers the one barrier that most impacts their participation in recycling while at work. Options included 1) don't feel it's my responsibility, 2) inconvenient, 3) lack of information, 4) lack of time, 5) no barriers, and 6) other (please describe). Half of participants (50%) reported there were no barriers to recycling at work. A thematic analysis of the "other" responses was conducted, and the top two themes were 1) certain items not accepted for recycling (i.e., glass) and 2) recycling gets dumped into the trash and not recycled. Some of the "other" responses were able to be recoded as lack of information or inconvenient. Throughout the survey, some participants mentioned they have observed the campus cleaning staff combining recycling bin materials with trash or disposing of recycling bin materials in the dumpsters, so they feel it is pointless to recycle at work. Figure 14 on the following page shows the percentage of participants that selected each barrier to recycling at work. No participants selected the "don't feel it's my responsibility" option so it is not included in the figure.

Furthermore, a cross-tabulation analysis was conducted with three recycling barriers (lack of information, lack of time, inconvenience) and the following independent variables: 1) employee role (staff, faculty), 2) gender (women, men), 3) length of employment at the university (10 years or less, more than 10 years), 4) generational status (Boomers, Gen X, Millennials), and 5) political beliefs (conservative, mixed, liberal).

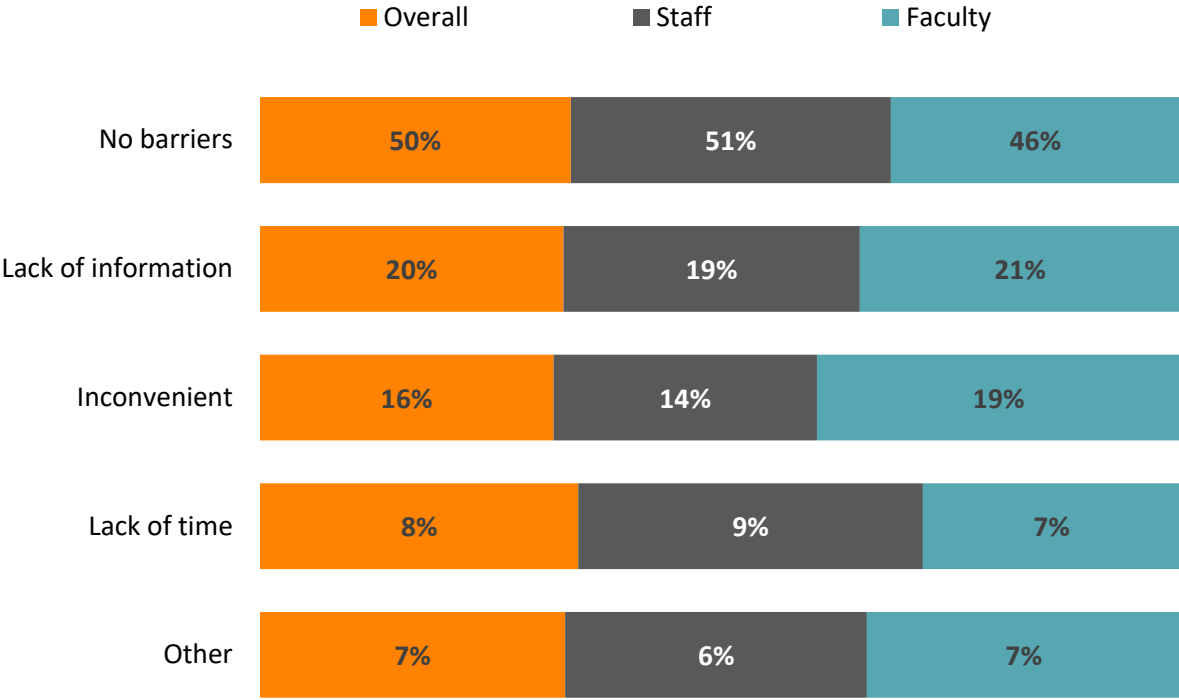


Figure 14: Barriers to Recycling at Work

Pearson's chi-square tests were conducted to examine the relationship between each of these independent variables and the recycling barriers. Results showed there is a significant relationship between recycling barriers and employees' length of employment at the university, $\chi^2 (1, N=161)=14.108, p<.001$. Employees who have been working at the university for 10 years or less are more likely to report a lack of information as the main barrier that impacts their participation in recycling at work than those who have been employed for more than 10 years. Those who have been employed more than 10 years are more likely to report lack of time and inconvenience as the primary impacting their participation in recycling at work.

Additionally, results from a Pearson's chi-square test also showed that there is a significant relationship between recycling barriers and employees' generational status, $\chi^2 (4, N=155)=13.484, p=.009$. Millennial employees are more likely than Gen X and Boomer employees to report lack of information as a primary barrier to recycling at work. Boomer and Gen X employees are equally as likely to report lack of time as a barrier to recycling at work, and Boomer employees are more likely than others to report inconvenience as a barrier to recycling at work. There were no significant relationships found between recycling barriers and employees' primary role, gender, or political beliefs. Table 12 on the next two pages shows additional details for the relationship between these three recycling barriers and participants' demographic variables.

Composting

Next, participants were asked to select from a list of barriers the one barrier that most impacts their participation in composting at work. Options included 1) don't feel it's my responsibility, 2) inconvenient, 3) lack of information, 4) lack of time, 5) no barriers, and 6)

Table 12: Relationship Between Recycling Barriers and Demographic Variables

Variable	χ^2	df	Valid N	p-value *significant	Barriers	% of Participants Within Variable
Primary role	2.132	2	166	.344	<i>Lack of information</i>	Staff: 46% Faculty: 47%
					<i>Lack of time</i>	Staff: 22.1% Faculty: 13.2%
					<i>Inconvenient</i>	Staff: 31.9% Faculty: 39.6%
Gender	1.747	2	153	.418	<i>Lack of information</i>	Women: 47.1% Men: 47.1%
					<i>Lack of time</i>	Women: 15.7% Men: 23.5%
					<i>Inconvenient</i>	Women: 37.3% Men: 29.4%
Length of employment	14.108	2	161	<.001*	<i>Lack of information</i>	10 yrs & less: 55.5% More than 10 yrs: 27.5%
					<i>Lack of time</i>	10 yrs & less: 55.5% More than 10 yrs: 27.5%
					<i>Inconvenient</i>	10 yrs & less: 31.8% More than 10 yrs: 39.2%

Table 12 Continued

Variable	χ^2	df	Valid N	p-value *significant	Barriers	% of Participants Within Variable
Generational status	13.484	4	155	.009*	<i>Lack of information</i>	Boomers: 29.6% Gen X: 37.9% Millennials: 62.9%
					<i>Lack of time</i>	Boomers: 25.9% Gen X: 25.9% Millennials: 10%
					<i>Inconvenient</i>	Boomers: 44.4% Gen X: 36.2% Millennials: 27.1%
Political beliefs	4.356	4	139	.360	<i>Lack of information</i>	Conservative: 33.3% Mixed: 59.3% Liberal: 47.7%
					<i>Lack of time</i>	Conservative: 33.3% Mixed: 59.3% Liberal: 47.7%
					<i>Inconvenient</i>	Conservative: 41.7% Mixed: 29.6% Liberal: 38.6%

Other (please describe). Participants reported both a lack of information (38%) and inconvenience (38%) as primary barriers to composting at work. Again, a thematic analysis of the “other” responses was conducted, and the top theme mentioned was “no food to compost.” Many of the “other” responses were able to be recoded as lack of information or inconvenient. A few participants also mentioned not having a designated person to empty or clean the composting bin, odor, and fruit flies as barriers to composting at work. Figure 15 on the next page shows the percentage of participants selecting each composting at work barrier.

Furthermore, a cross-tabulation analysis was conducted with three composting barriers (lack of information, lack of time, inconvenience) and the following independent variables: 1) employee role (staff, faculty), 2) gender (women, men), 3) length of employment at the university (10 years or less, more than 10 years), 4) generational status (Boomers, Gen X, Millennials), and 5) political beliefs (conservative, mixed, liberal).

Pearson’s chi-square tests were conducted to examine the relationship between each of these independent variables and the composting barriers. Results showed there is a significant relationship between composting barriers and employees’ political beliefs, $\chi^2 (4, N=259)=10.809, p=.029$. Employees with liberal political beliefs are more likely to report a lack of information as the primary barrier to their participation in composting at work compared to those with mixed and conservative political beliefs. Employees with conservative beliefs are more likely than those with mixed and liberal political beliefs to report inconvenience and lack of time as the primary barriers to composting at work. There were no significant relationships found between these composting barriers and employees’ role, gender, length of employment at the university, or their generational status.

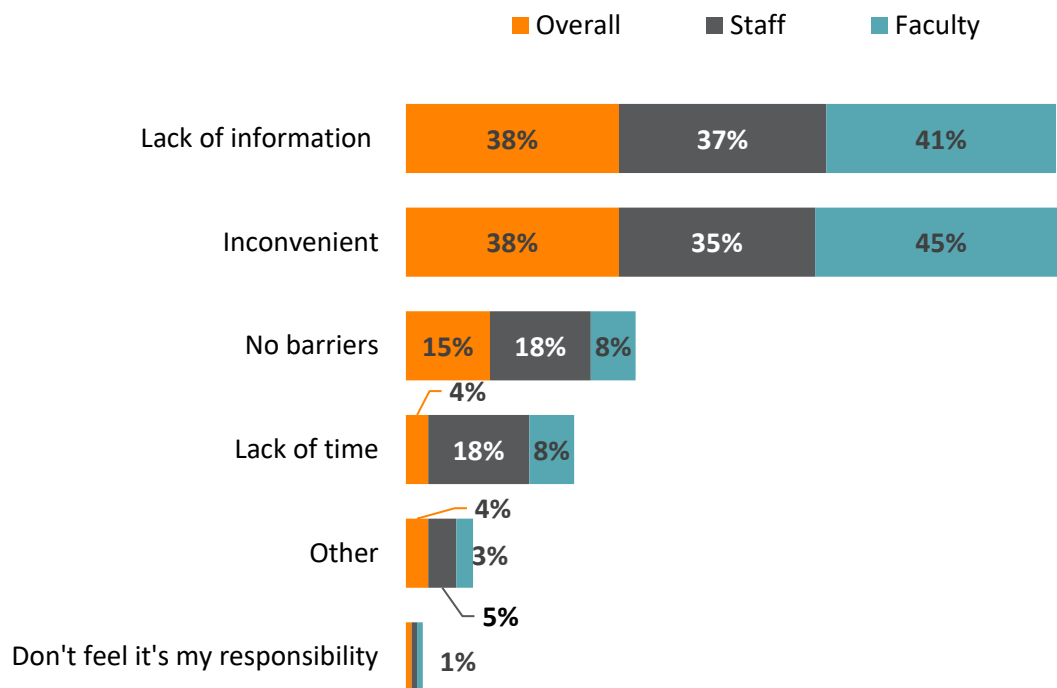


Figure 15: Barriers to Composting at Work

Table 13 shows additional details for the relationships between these three composting barriers and participants' demographic variables.

Energy Conservation

Participants were asked to select from a list of barriers the one barrier that most impacts their participation in conserving energy while at work. Options included 1) don't feel it's my responsibility, 2) inconvenient, 3) lack of information, 4) lack of time, 5) no barriers, and 6) other (please describe). Most participants (65%) reported there were no barriers to conserving energy at work. A thematic analysis of the "other" responses was conducted and top barriers to conserving energy included: 1) working remotely – can't shut down computer due to VPN access, 2) OIT said not to shut down computer, and 3) shared office space – can't turn off lights. A few participants mentioned forgetfulness as a barrier, and a couple mentioned not being able to control the office thermostat as a barrier. Following Table 14, Figure 16 shows the percentage of participants who selected each barrier to conserving energy at work. A cross-tabulation analysis was conducted with three energy conservation barriers (lack of information, lack of time, inconvenience) and the following independent variables: 1) employee role (staff, faculty), 2) gender (women, men), 3) length of employment at the university (10 years or less, more than 10 years), 4) generational status (Boomers, Gen X, Millennials), and 5) political beliefs (conservative, mixed, liberal).

Pearson's chi-square tests were conducted to examine the relationship between each of these independent variables and three energy conservation barriers. Results showed there are no significant relationships between these energy conservation barriers and employees' role (staff, faculty), gender (women, men), length of employment at the

Table 13: Relationship Between Composting Barriers and Demographic Variables

Variable	χ^2	df	Valid N	p-value *significant	Barriers	% of Participants Within Variable
Primary role	1.889	2	305	.389	<i>Lack of information</i>	Staff: 47.8% Faculty: 49%
					<i>Lack of time</i>	Staff: 6.8% Faculty: 3%
					<i>Inconvenient</i>	Staff: 45.4% Faculty: 48%
Gender	1.884	2	285	.390	<i>Lack of information</i>	Women: 49.7% Men: 46.6%
					<i>Lack of time</i>	Women: 4.1% Men: 8%
					<i>Inconvenient</i>	Women: 46.2% Men: 45.5%
Length of employment	5.531	2	298	.063	<i>Lack of information</i>	10 yrs & less: 46.7% More than 10 yrs: 52.4%
					<i>Lack of time</i>	10 yrs & less: 3.6% More than 10 yrs: 8.7%
					<i>Inconvenient</i>	10 yrs & less: 49.7% More than 10 yrs: 38.8%
Generational status	2.650	4	289	.618	<i>Lack of information</i>	Boomers: 51.7% Gen X: 51.3% Millennials: 45.6%
					<i>Lack of time</i>	Boomers: 6.7% Gen X: 6.1% Millennials: 3.5%
					<i>Inconvenient</i>	Boomers: 41.7% Gen X: 42.6% Millennials: 50.9%

Table 13 Continued

Variable	χ^2	df	Valid N	p-value *significant	Barriers	% of Participants Within Variable
Political beliefs	10.809	4	259	.029*	<i>Lack of information</i>	Conservative: 38.9% Mixed: 49.1% Liberal: 54.7%
					<i>Lack of time</i>	Conservative: 11.1% Mixed: 9.4% Liberal: 1.8%
					<i>Inconvenient</i>	Conservative: 50% Mixed: 41.5% Liberal: 43.5%

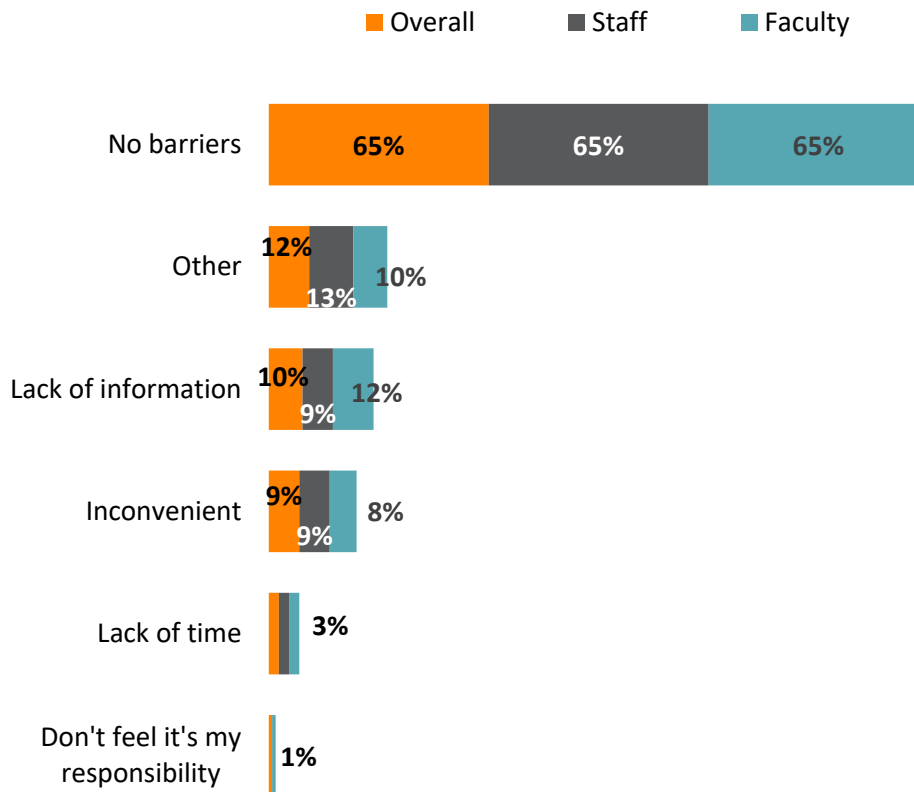


Figure 16: Barriers to Conserving Energy at Work

university (10 years or less, more than 10 years), generational status (Boomers, Gen X, Millennials), or political beliefs (conservative, mixed, liberal). Table 14 on the next page shows additional details for the relationship between these energy conservation barriers and participants' demographic variables.

Additional Barriers

Participants were asked to describe any additional barriers or reasons that might keep them from engaging in green behaviors while at work. While about 100 participants responded to this question, most used the space to make comments about the green behaviors they are doing, things they don't like, or barriers that were already mentioned: inconvenience/lack of access in their building, lack of time, and lack of information. However, there were several additional barriers mentioned by respondents, including campus culture, skepticism, transportation issues, frustration, overflowing/lack of bins, and building issues. A table of these themes and related quotes can be found in Appendix G.

"Green behavior is not valued by mid and upper administration."

-Survey respondent

Barriers Summary

When examining barriers to recycling, composting, and energy conservation on campus, survey respondents reported fewer barriers were present for energy conservation and recycling compared to composting. For example, 65% of participants said there were no barriers to conserving energy at work, and 50% reported there were no barriers to recycling. Lack of information was reported as the most common barrier to recycling with only 20% of

Table 14: Relationship Between Energy Conservation Barriers and Demographic Variables

Variable	χ^2	df	Valid N	p-value *significant	Barriers	% of Participants Within Variable
Primary role	.735	2	84	.692	<i>Lack of information</i>	Staff: 42.4% Faculty: 52%
					<i>Lack of time</i>	Staff: 16.9% Faculty: 12%
					<i>Inconvenient</i>	Staff: 40.7% Faculty: 36%
Gender	2.667	2	79	.264	<i>Lack of information</i>	Women: 47.1% Men: 46.4%
					<i>Lack of time</i>	Women: 19.6% Men: 7.1%
					<i>Inconvenient</i>	Women: 33.3% Men: 46.4%
Length of employment	.710	2	83	.701	<i>Lack of information</i>	10 yrs & less: 48.3% More than 10 yrs: 40%
					<i>Lack of time</i>	10 yrs & less: 13.8% More than 10 yrs: 20%
					<i>Inconvenient</i>	10 yrs & less: 37.9% More than 10 yrs: 40%
Generation	6.077	4	76	.193	<i>Lack of information</i>	Boomers: 57.1% Gen X: 33.3% Millennials: 52.6%
					<i>Lack of time</i>	Boomers: 14.3% Gen X: 29.2% Millennials: 7.9%
					<i>Inconvenient</i>	Boomers: 28.6% Gen X: 37.5% Millennials: 39.5%

Table 14 Continued

Variable	χ^2	df	Valid N	p-value *significant	Barriers	% of Participants Within Variable
Political beliefs	5.525	4	73	.238	<i>Lack of information</i>	Conservative: 30% Mixed: 42.9% Liberal: 53.1%
					<i>Lack of time</i>	Conservative: 30% Mixed: 14.3% Liberal: 6.1%
					<i>Inconvenient</i>	Conservative: 40% Mixed: 42.9% Liberal: 40.8%

respondents saying so, and only 12% of respondents said lack of information was a barrier to conserving energy at work. A lack of information and inconvenience are both considered barriers to composting by 38% of participants. Additionally, no respondents reported they did not feel that recycling is their responsibility, and only 1% of respondents reported that they felt composting and conserving energy at work is not their responsibility. This indicates there is potential to get more employees involved in green behaviors at work if some of these barriers can be overcome.

Moreover, results showed that there are some statistically significant differences in perceived barriers to recycling and composting among different demographic groups, and there are no statistically significant differences in perceived barriers to energy conservation among the demographic groups. Differences in recycling barriers were found among two variables: length of employment and generational status. For instance, employees working at the university for 10 years or less are more likely than those who have worked for more than 10 years to report lack of information as the primary barrier to recycling. In contrast, employees who have been there for more than 10 years are more likely to report both lack of time and inconvenience as the primary recycling barriers. Millennial employees are more likely than Gen X and Boomers to say that lack of information is the primary barrier to recycling at work. Gen X and Boomer employees are more likely to say that lack of time is the primary barrier to recycling, and Boomers are also more likely than Gen X and Millennials to report inconvenience as a recycling barrier.

For composting barriers, the only demographic variable showing statistically significant differences among groups is political beliefs. Employees with liberal political beliefs are more likely to say that lack of information is the primary barrier to composting at

work. This indicates that if these employees knew composting was an option on campus, they would be willing to participate. Some of the open-ended comments also confirmed this. Conservative employees are more likely to say that inconvenience is the primary barrier to composting at work.

Chapter Summary

In summary, this chapter described the findings from this study. Participants' demographics were first discussed in detail, including 1) their primary role on campus (faculty, staff), 2) their employment status (full-time, part-time), 3) length of employment, 4) their work situation (on-campus, hybrid, remotely), 5) work location (college, office), 6) generational status, 7) highest degree or level of education completed, 8) political beliefs, and 9) gender. Data collected for each of the four research questions (awareness, participation, motivation, barriers) were also discussed in detail, including the visualization of data in figures and tables. A discussion of this study's results and implications are found in chapter 5.

CHAPTER 5: DISCUSSION

This chapter includes a discussion of the overall findings for each of the four areas related to the study's research questions: awareness of campus sustainability initiatives, participation in these initiatives, motivation to engage or participate in green behaviors at work, and barriers to engaging in green behaviors at work. Following this discussion, the study's limitations and implications are discussed, and this chapter ends with a brief discussion of future research.

Summary of Results

Awareness

Overall, most participants (70%) reported they were aware of the Office of Sustainability, and a statistically significant relationship was found between employees' awareness of the Office of Sustainability and two demographic variables: primary role on campus and gender. Staff (81%) reported they are more aware of the Office of Sustainability than faculty (73%) and women (83%) are more aware than men (70%). No statistically significant relationship was found between employees' awareness of the Office of Sustainability and their length of employment at the university, generational status, or political beliefs. In addition, the most common ways participants reportedly learned about the Office of Sustainability was from weekly university emails about campus updates and events (25%) and seeing signs around campus (23%).

On the other hand, most participants reported they were not aware of the Campus Sustainability Master Plan (71%) or the Chancellor's goal to divert 50% of campus waste from landfills by 2030 (85%). Since most employees are unaware of these two initiatives, there is definitely a need to increase employees' awareness of them. Campus culture was identified

by study participants as one barrier to engaging in green workplace behaviors. Another specifically mentioned that the Chancellor should show support for any campus sustainability goals (e.g., discuss at town hall events, include in the state of the university address, etc.). Having campus leadership acknowledge the goals and integrate them in the strategic plan could help motivate some employees to participate. In addition, a statistically significant relationship was found between employees' awareness of the Campus Sustainability Master Plan and length of employment at the university. Employees who have been at the university for more than 10 years are more likely to be aware of the plan than those who have been there for 10 years or less. Results also found a statistically significant relationship between awareness of this plan and employees' generational status. Boomer employees are more likely to be aware of the plan than Gen X and Millennial employees.

Similarly, a statistically significant relationship was found between awareness of the Chancellor's campus waste diversion goal and employees' length of employment, generational status, and political beliefs. Employees' who have been at the university for more than 10 years, Boomers, and those with conservative beliefs are more likely to be aware of the Chancellor's goal to divert 50% of campus waste from landfills by 2030. One possible explanation for this is that given their age, Boomers are more likely to have been at the university for more than 10 years and according to research conducted by the Pew Research Center, Boomers are more likely to hold conservative political beliefs whereas Gen X and Millennials tend to be more liberal in their beliefs (Maniam & Smith, 2017). It is also a possibility that given their length of time employed at the university, this group of employees are more likely to hold more administrative leadership positions with an increased

interaction with other leaders on campus such as the Chancellor or require a broader knowledge of the university's strategic plan.

Furthermore, there were only four (out of 18) sustainability initiatives that most participants reported being aware of which included: 1) water bottle refill stations (90%), 2) interior recycling bins (89%), 3) exterior recycling bins (69%), and 4) electric vehicle charging stations (58%). For the remaining 14 initiatives included in the survey, employee awareness ranged from only 8% (CCE) to 39% (Zero Waste Campus Events). However, some slightly good news is that very few participants (2%) reported they were not aware of any of these 18 campus sustainability initiatives. Given that these four initiatives on campus are some of the most visible, it is possible that the other initiatives are just not as visible to all employees and that is why they are less aware. Going forward, the Office of Sustainability and the CCE could discuss ways these other initiatives are promoted or advertised across campus and maybe prioritize promoting the ones that would have the most impact on the university's sustainability goals if more employees were aware and participated.

Moreover, when asked what could be recycled on campus, most participants were aware that paper (98%), plastic (96%), aluminum cans (94%), and cardboard (89%) could be recycled, but less than half of participants were aware of other materials that could be recycled. These findings indicate there is opportunity for improvement in educating employees on both the many sustainability initiatives on campus besides the most visible ones (water refill stations, recycling bins, electric vehicle charging stations), and the variety of materials that can be recycled beyond paper, plastic, and aluminum cans. Because participants reported a low awareness of several recyclable materials, it is reasonable to

conclude that these items are ending up in the trash instead. Just increasing an awareness of what can be recycled could lead to higher participation rates among employees.

In addition, about 40% of participants offered suggestions for ways to increase employees' awareness of campus sustainability initiatives and four major themes emerged from these responses. The most common suggestion was that better promotion or marketing of campus sustainability initiatives is needed. For example, some participants suggested offering incentives and creating a campus-wide sustainability competition to get more employees involved. Other suggestions included hosting more events targeting staff rather than only students, hosting events during the traditional work hours, establishing an annual "Help Clean the Campus" day, and meet and greet events across campus.

The second most common suggestion was there should be better signage and visibility of initiatives. Examples included updating signage on recycling bins so that people would know what can be recycled (especially for exterior bins), increasing the number of composting bins (many had no idea this was an option), increasing the number of exterior recycling bins, including in places like parking garages, increasing battery recycling stations, and more visible signage regarding The Mug Project. A few participants mentioned they were not sure if The Mug Project still existed since being temporarily discontinued because of the COVID-19 pandemic.

Thirdly, some respondents suggested that the Office of Sustainability should send out emails or newsletters that remind and/or inform employees about campus sustainability initiatives, including why it's important to participate. At least one person suggested using this platform as a way of sharing any data that could highlight the good being done, such as how initiatives save the university money. The Office of Sustainability already distributes an

e-newsletter, but it is one you have to opt-in to and most employees would not be aware of it unless they sought out more information about sustainability from the office website.

Hosting trainings or meetings was the fourth most common suggestion for increasing awareness of campus sustainability initiatives among university employees. Specifically, participants mentioned including sustainability training during new employee orientation, having Office of Sustainability staff attend departmental or office staff meetings to discuss initiatives and encourage participation, hosting a lunch and learn series, creating training videos, and requiring a campus-wide yearly online sustainability training similar to those already required like cyber security, Title IX, and FERPA.

Participation

Regarding personal participation in green behaviors at work, the majority of participants reported they always engaged in three behaviors: 1) turn off office lights at the end of the day (76%), 2) place recyclable materials in the interior recycling bins (74%), and 3) use the water bottle refill stations (59%). In contrast, there were two green behaviors that respondents reported they never do: 1) drive an electric vehicle to work (76%) and 2) carpool or take alternative transportation to work (70%). In the open-ended responses, some participants mentioned their lack of access to public transportation, a lack of bike lanes to and from campus, and the fact they can't afford to own an electric vehicle as barriers, so it makes sense that participation in these two areas are low.

Furthermore, several statistically significant relationships were found between personal participation in green workplace behaviors and different demographic groups. Faculty drive electric vehicles and carpool or take alternative modes of transportation to work more often than staff. Results indicated that women employees engage in the following

green workplace behaviors more often than men: 1) place recyclable materials in the interior recycling bins, 2) place recyclable materials in the exterior recycling bins, 3) turn off their office lights at the end of the day, and 4) use the My Tiny Trash bin in their offices. These findings support previous research (Casalo & Escario, 2018; Lee, et al., 2013; Kollmuss & Agyeman, 2010) showing that women are more likely than men to engage in green or pro-environmental behaviors.

In addition, employees who have been working at the university for 10 years or less reported they engaged in two green workplace behaviors more often than employees who have worked there for more than 10 years: 1) use the My Tiny Trash bin in their offices, and 2) use the water bottle refill stations. In addition, Gen X employees use the exterior recycling bins more often than Millennials and Millennials use the water bottle refill stations more often than Gen X and Boomers. Previous research by gerontologists suggests that older individuals' supposed willingness to change habits is a key barrier to green behaviors in aging populations (Pillemer et al., 2011). However, more recent research has also found the relationship between age and most environmental behaviors to be small, with older individuals more likely to engage in behaviors that avoided environmental harm and conserved resources (Wiernick et al., 2016). Results also showed that employees with liberal political beliefs carpooled or took alternative modes of transportation to work more often than those with conservative beliefs.

The last part of the participation questions focused on office level participation in green workplace behaviors. Survey results showed that the most common campus sustainability initiatives that participants' offices engage in are recycling (85%) and My Tiny Trash (78%). Low participation rates were reported for composting, the Green Office

Program, and Zero Waste Events. At least 15% of respondents reported they were unsure of which campus sustainability initiatives their office participated.

Motivation

The majority of survey respondents (68%) agreed they would be motivated to engage in green behaviors while at work if these behaviors were encouraged or promoted by their supervisors or departmental leadership. Results showed statistically significant differences in motivation by supervisors among three demographic variables: gender, generational status, and political beliefs. Women employees are more likely than men to agree they would be motivated by their supervisors or departmental leadership to engage in green behaviors at work. Millennials are more likely than Boomers to be motivated by supervisors or departmental leadership. Liberal employees are more likely than both conservative employees and employees with mixed political beliefs to be motivated to engage in green workplace behaviors if encouraged by their supervisors or department leadership. This finding supports previous research that leadership plays a crucial role in improving environmentally responsible behavior in organizations (Ahmad et al., 2021; Ahmad & Umrani, 2019; Luu, 2019). Recent research by Ahmad et al. (2021) found that employees' "engagement in green behavior is significantly influenced by their supervisors' ethical and pro-environmental behavior" (p. 541).

Moreover, slightly more respondents (71%) agreed they would be motivated to participate in green behaviors at work if they observed their coworkers engaging in these behaviors. Results showed statistically significant differences in motivation by coworkers among four demographic variables: gender, length of employment, generational status, and political beliefs. Again, women employees are more likely than men to agree they would be

motivated to engage in green behaviors at work if they observe their coworkers participating in these behaviors. Employees who have been at the university for 10 years or less are more likely than those who've been there for more than 10 years to agree that they would be motivated to participate by coworkers. Millennial employees are more likely than Boomers to agree they would be motivated to engage in green behaviors if they observed their coworkers participating in such behaviors. Finally, liberal employees are more likely than conservative employees to agree they would be motivated to engage in green workplace behaviors if their coworkers are also engaging in these behaviors.

While some employees mentioned the use of incentives to increase employees' awareness of campus sustainability initiatives, the use of incentives might be more useful in increasing employees' motivation to participate in green workplace behaviors. Previous research on the use of incentives to motivate employees has found that incentives can influence employees' motivations at work (Novianty et al., 2018; Kvaloy & Schottner (2015); Finkelstein & Kosa, 2003). Incentives could range from personal acknowledgement, time off, awards, monetary rewards, or even including certain behaviors as part of an employee's performance evaluation. However, as noted by Landry et al. (2017), research stemming from self-determination theory advises against using monetary incentives to motivate employees to perform. Rather, as discussed earlier in chapter 2, SDT focuses on meeting employees' psychological needs (competence and autonomy) as a way to motivate them.

It is important to mention there is already an award incentive in place on this campus related to campus sustainability. The Sustainability Champion award is a monthly award that recognizes faculty, staff, or students who lead by example through their environmental stewardship, leadership, activism, etc., and anyone can nominate one of these individuals for

the award. However, as indicated by survey results, only 9% of employees are aware this initiative exists.

Barriers

When examining barriers to recycling, composting, and energy conservation on campus, survey respondents reported fewer barriers were present for energy conservation and recycling compared to composting. For example, 65% of participants said there were no barriers to conserving energy at work, and 50% reported there were no barriers to recycling. Lack of information was reported as the most common barrier to recycling with 20% of respondents saying so, and only 12% of respondents said lack of information was a barrier to conserving energy at work. A lack of information and inconvenience are both considered barriers to composting by 38% of participants. Additionally, no respondents reported they did not feel that recycling is their responsibility, and only 1% of respondents reported that they feel composting and conserving energy at work is not their responsibility. This indicates there is potential to get more employees involved in green behaviors at work if some of the other barriers can be overcome.

Furthermore, results showed that there are some statistically significant differences in perceived barriers to recycling and composting among different demographic groups, and there are no statistically significant differences in perceived barriers to energy conservation among the demographic groups. Differences in recycling barriers were found among two variables: length of employment and generational status. For instance, employees working at the university for 10 years or less are more likely than those who have worked for more than 10 years to report lack of information as the primary barrier to recycling. In contrast, employees who have been there for more than 10 years are more likely to report both lack of

time and inconvenience as the primary recycling barriers. Millennial employees are more likely than Gen X and Boomers to say that lack of information is the primary barrier to recycling at work. Gen X and Boomer employees are more likely to say that lack of time is the primary barrier to recycling, and Boomers are also more likely than Gen X and Millennials to report inconvenience as a recycling barrier. Those that have been working at the university for 10 years or less are also likely to be younger (mostly Millennials) so it is important to consider how best to share information with younger generations, especially as more Gen Z employees join the workforce. While email may be the preferred mode of sharing information with employees due to convenience, successful environmental education outreach will require additional methods to reach the younger employees whose communication preference may not be email.

Previous research has focused on generational differences in workplace communication style between managers, subordinates, and coworkers (Bannon et al., 2011; Hall, 2016), but there is not much in the literature that focuses on generational preferences for sharing general information at work. However, there are frameworks discussed in the environmental education literature that address communication related to environmental education strategies (Fien et al., 2001; Monroe et al., 2007; Scott & Gough, 2003). The type of communication strategies recommended vary based on the purpose of program (e.g., sharing information, education, capacity building). For instance, if the objective is to increase awareness and understanding of a specific issue, you would disseminate information in a variety of media, including public relations and advertising, and information campaigns that occur in-person, via paper, through audio-visual, and electronic media formats (Scott & Gough, 2003).

Moreover, the only demographic variable showing statistically significant differences in composting barriers among groups is political beliefs. Employees with liberal political beliefs are more likely to say that lack of information is the primary barrier to composting at work. This indicates that if these employees knew composting was an option on campus, they would be willing to participate. Some of the open-ended comments also confirmed this. Conservative employees are more likely to say that inconvenience is the primary barrier to composting at work. Making some of these initiatives more convenient could increase participation rates as well.

Limitations

One of the main limitations of this study is that the university's Human Resources rules prohibited the researcher from emailing the survey to all employees. This impacted the potential for a larger, more diverse sample size. There was such a small sample size among some demographic groups that they had to be excluded from analysis. For example, there was a lack of employee representation among some colleges on campus, job type, and generational groups.

Another study limitation is that data were collected right before the beginning of a new semester when not all faculty had returned to campus or were busy preparing for their classes. Additionally, the researcher received several automatic out of office email replies when the survey was emailed, so some staff were on vacation during this time. Perhaps a better time would have been once the semester had gotten started, after the initial drop/add period.

A third limitation of this study is related to a common limitation of survey research: the data lack details or depth that is obtained through qualitative research methods such as

interviews or focus groups. However, the survey included open-ended questions that provided the opportunity for participants to provide more detailed feedback in some areas.

Finally, social desirability bias is a real possible limitation to this study. When research participants are asked to self-report their actions, beliefs, attitudes or other sociopsychological variables, it is not unlikely that they bias their responses to give a better social impression of themselves (Kaiser et al., 1999; Vesely & Kockner, 2020). While it is possible that individuals with pro-environmental beliefs may bias their self-reported behavior upwards, those with less pro-environmental or anti-environmental beliefs may also underreport their sustainable behaviors (Brick et al., 2017). As noted by Vesely and Klockner (2020), “it is unlikely that controlling for social desirability alone would be enough to obtain entirely unbiased attitudinal and behavioral measures” (p.5). However, the inclusion of social desirability scales as control variables in environmental research could enhance internal validity and generate more data that can be used to evaluate possible side effects of social desirability (Vesely Klockner, 2020; Brick et al., 2017).

Implications

According to Varela-Candamio et al. (2017), environmental education is the main driver explaining green behaviors and is also the key factor in determining pre-environmental awareness, attitudes, and motivation. This study’s results show there is opportunity to enhance environmental education efforts at this university. Employee awareness was highest for the more visible sustainability initiatives such as recycling (interior and exterior), water-bottle stations, and electric vehicle charging stations. While awareness is high for recycling, there is room for improvement when it comes to making sure employees are aware of what can be recycled. Most employees are only aware that paper, plastic, aluminum cans, and

cardboard can be recycled. In addition, some incorrectly stated that glass can be recycled, which is not the case on this particular campus. Awareness is lower among the younger generations so any future environmental education efforts that focus on increasing awareness should include a multi-pronged communication approach, with communication considerations in mind for younger generations.

Since a high percentage of participants (71%) said they would be motivated by coworkers to engage in green behaviors, this is a good opportunity to promote the university's Green Office Program and try to get an environmental steward in each office or department to lead sustainability efforts within the office. Based on this study's results, including women, liberal, and Millennial employees to serve as campus environmental stewards might be beneficial. Employees from these groups are more likely to be motivated to participate in green workplace behaviors, assuming barriers such as lack of awareness and inconvenience are addressed. Identifying such employees could be challenging but asking for volunteers from these groups might be one strategy in getting them involved. An announcement for volunteers could be made via the weekly campus update email, shared via flyers, and shared with departmental leadership so that they can share with employees in staff meetings. It is also possible that individuals from these demographic groups are already seeking out ways to help campus sustainability efforts such as by joining the CCE. Asking members on this committee if they would be willing to serve as environmental stewards in their respective offices or departments is a logical starting point.

Furthermore, since 68% of respondents said they would be motivated by their supervisor or departmental leadership to engage in green workplace behaviors, this suggests it is important to have supervisors serve as role models for positive environmental behaviors.

Support and encouragement from supervisors and other leadership, including the Chancellor, is important for employee buy in. Employees need to be educated on why campus sustainability is important and hearing this from their supervisors or campus leaders makes such claims more credible.

Responses from the open-ended question about motivation also offer insight into ways to increase motivation to participate in green workplace behaviors which will hopefully translate into increased participation. The most common response was “easy access,” suggesting that many are already motivated to participate, it’s just not easy or convenient to do. The second most common suggestion was more education and awareness are needed, which again indicates the motivation is already there, but employees just aren’t sure what to do. The third most common response was incentives, however, most who mentioned this did not clarify which type of incentive would help motivate them. A few mentioned financial incentives such as discounts. One financial/discount incentive is already in place with The Mug Project yet some don’t know about it or thought it had been discontinued. This indicates there is a need to increase awareness of incentives already in place or any that are implemented in the future.

Moreover, some participants in this study mentioned lack of support from their supervisors as a barrier to participation so supervisor involvement could impact motivation as well as remove a barrier. Several participants mentioned they were told not to shut down their office computers at the end of the workday and they identified this as a barrier to energy conservation on campus. Future environmental education efforts should include campus partners such as the Office of Information Technology (OIT) and Facilities Services to clarify pertinent campus policies that might impact campus sustainability efforts. Any campus

sustainability training materials (e.g., handouts, videos, modules, etc.) could include these offices' recommendations for conserving energy and reducing waste.

Regarding barriers to green workplace behaviors, it is important to address inconvenience where possible. This was noted by participants as the second biggest barrier after lack of information. Perhaps the easiest way to address inconvenience is to increase access, assuming resources are available. An example would be increasing the number of composting and recycling bins around campus. However, there also needs to be a clear plan established indicating who is responsible for the emptying and upkeep of bins. This was a concern of some participants regarding composting. In addition, rumors that facilities' staff are throwing recyclables in the trash and not recycling them should also be addressed. Any ongoing efforts to increase green behaviors among employees will not be successful if this is not dispelled.

Finally, since increasing green workplace behaviors at a large, research university is a complex undertaking, a systems thinking approach to tackling this issue is warranted. To ensure a careful balance of environmental, social, and economic performance, sustainable organizations require a systems approach (Jackson et al., 2012; Ones & Dilchert, 2013). Examining the whole system allows for consideration of multiple stakeholder concerns and externalities and facilitates understanding of the organization as a whole and complex entity (DuBois et al., 2013). This is already happening to some extent through the CCE. This committee consists of university stakeholders (administrators, faculty, staff, and students), and sustainability officials from the city that advise the university administration on institutional policies and behaviors that promote environmental stewardship on campus. To my knowledge, there is no one from OIT involved with CCE, so this offers a good opportunity

to include OIT staff in campus sustainability discussions and plans. Having an OIT representative could help clarify policies regarding shutting down computers at the end of the day. Some participants stated they were told not to do so by OIT. Moving forward, the CCE and the Office of Sustainability should continue working together to prioritize sustainability initiatives and consider stakeholder feedback in developing environmental education outreach plans and implementing new initiatives.

Future Research

This study examined university employees' green behaviors in the workplace, focusing on their awareness of and participation in campus sustainability initiatives, motivation to participate in green behaviors at work, and the identification of barriers that keep them from engaging in green workplace behaviors. This study could be expanded to include universities outside of the southeastern U.S. to determine if geographic location has an impact on workplace sustainability. Research at different sized institutions would also be another avenue to explore. For instance, is it easier to implement an awareness campaign to increase green behaviors at a smaller school? Another area of future research could include investigating which variables might predict employee participation green workplace behaviors. Since participants in this study mentioned the use of incentives as one way to increase employee motivation to participate in campus sustainability initiatives, research on the effectiveness of using incentives to increase employees' participation in green workplace behaviors is warranted.

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APPENDICES

APPENDIX A: Recruitment Email

Hello \${m://FirstName},

Because you are an employee at the University of Tennessee, Knoxville (UT), we are inviting you to participate in an anonymous, brief online survey (less than 10 minutes) that seeks to understand UT employees' awareness of and participation in sustainability initiatives and green behaviors on the Knoxville campus. Your feedback will help the **UT Office of Sustainability** understand the extent to which faculty and staff participate in these initiatives, including motivation to participate, and barriers prohibiting participation.

Your participation is entirely voluntary. As a thank you for participating, you may choose to enter a prize drawing at the end of the survey. You will have the chance to win one (1) of forty (40) \$10 gift cards to Golden Roast Coffee (<https://tgroast.com/>). To complete the survey, click the link below.

Follow this link to the survey: <https://tinyurl.com/UTKgreen> Or copy and paste the URL into your internet browser.

Thank you in advance for your time and participation. Please don't hesitate to contact me (snicjo@utk.edu) or Dr. Jennifer Ann Morrow (jamorrow@utk.edu) if you have any questions.

Sincerely,

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APPENDIX B: Recruitment Flyer

UT Employee Participants Needed for Dissertation Research Study

We are conducting a research study that will investigate UT employees' green behaviors while on campus. This research is sponsored by UT's Office of Sustainability and is designed to better understand the extent that UT employees are aware of and are motivated to participate in campus sustainability initiatives.

WHO IS ELIGIBLE?

Employees (faculty & staff) at the UT Knoxville campus

DESCRIPTION OF STUDY

Participants will complete a brief online survey. There are no anticipated risks or benefits for participating. Participants will have the chance to win one of forty \$10 gift cards to Golden Roast Coffee.

HOW TO PARTICIPATE?

Scan the QR code below or visit <https://tinyurl.com/utkgreen>

QUESTIONS?

Please contact Nicole Jones at snicjo@utk.edu or Dr. Jennifer Morrow at jamorrow@utk.edu.



APPENDIX C: Survey

UT Employees' Green Behaviors Survey

[Consent Form Inserted Here]

- ☐ Yes, I agree to participate.
- ☐ No, I do not want to participate. (if selected, survey ends)

Screening Question

Q1. What is your primary role at UT Knoxville?

- ☐ Staff
- ☐ Faculty
- ☐ Administration
- ☐ Student (if selected, survey ends)
- ☐ Other (please describe): _____

Section I: Awareness & Participation

This section includes questions that seek to understand your awareness of and participation in campus sustainability initiatives.

Q2. Before today, were you aware of the Office of Sustainability on the Knoxville campus?

- ☐ Yes
- ☐ No (if selected, skip to Q4)

Q3. How did you learn about the Office of Sustainability? (Select all that apply.)

- ☐ An article in Tennessee Today or Vol Update
- ☐ Attended a campus event hosted by the office (e.g., Big Green Friday, Earth Month Celebration, etc.)
- ☐ Co-worker or supervisor
- ☐ I work in the Office of Sustainability
- ☐ Saw signs around campus (e.g., My Tiny Trash, Office recycling bins)
- ☐ Social media
- ☐ Student(s)
- ☐ Office of Sustainability website
- ☐ Previous surveys distributed by the Office of Sustainability
- ☐ Other (please describe): _____

Q4. Before today, which of the following UT sustainability initiatives have you heard of, seen, or participated in? (Select all that apply.)

- ☐ Committee for Campus Environment
- ☐ Eco To-Go (reusable to-go boxes at Stokely's Fresh Food Company)
- ☐ Electric vehicle charging stations
- ☐ Exterior recycling bins
- ☐ Interior recycling bins in the hallway or breakroom near your office
- ☐ Move out donations

- ☐ My Tiny Trash
- ☐ Public Recycling Drop Off (2121 Stephenson Drive Dock 24)
- ☐ Solar-powered outlets on select picnic tables around campus
- ☐ Sustainability Champion (monthly award recognizing a UT faculty, staff, or student who leads by example in environmental stewardship, leadership, or activism)
- ☐ Sustainability events (e.g., Big Green Friday, Sustainability Symposium, etc.)
- ☐ The Free Store (community share space that allows UT students to shop for free clothing, kitchenware, etc.)
- ☐ The Green Office Program (certification program that engages faculty & staff in helping campus offices contribute to the university's sustainability goals)
- ☐ The Grow Lab (campus garden/laboratory that promotes experiential and service learning and seeks to address food insecurity)
- ☐ The Mug Project (campus-wide initiative to eliminate single use containers and bottles by encouraging and incentivizing the use of reusable bottles and mugs on campus)
- ☐ UT Compost Facility
- ☐ Water bottle refill stations
- ☐ Zero Waste Events (compost and recycling bins provided for your campus events)
- ☐ Zero Waste Game Day (recycling bins provided at tailgating locations and around Neyland Stadium during home football games)
- ☐ None of the above
- ☐ Other (please describe): _____

Q5. Please use the space below to share any feedback you have about UT's sustainability initiatives.

Q6. Which of the following items are you aware of that can be recycled on the Knoxville campus? (Select all that apply.)

- ☐ Aluminum cans
- ☐ Batteries
- ☐ Cardboard
- ☐ Electronic waste (e.g., printer/toner cartridges, small electronics)
- ☐ Food waste
- ☐ Paper
- ☐ Plastic bottles
- ☐ Plastic wrap/film
- ☐ Steel cans
- ☐ Other (please describe): _____

Q7. Please rate how often you engage in the following behaviors while working at the Knoxville campus.

Scale: 1= Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Always, N/A = Not applicable

	Scale will be listed for each item in a matrix table
Bring a reusable mug to receive a drink discount at participating locations on campus (The Mug Project)	
Drive an electric vehicle to work	

Place recyclable materials in the blue or green recycling bins in my office or department	
Place recyclable materials in the recycling bins outside around campus	
Place recyclable materials in the regular grey trash bins	
Shut down my computer at the end of the workday	
Turn the lights off when I leave my office	
Use hand dryers instead of paper towels after washing my hands	
Use the My Tiny Trash bin in my office	
Use the water bottle refill stations on campus	
Walk, bike, carpool, or take public transportation to work	

Q8. Which of the following sustainability initiatives does your office or department participate in? (Select all that apply.)

- ☐ Composting
- ☐ My Tiny Trash
- ☐ Recycling
- ☐ The Green Office Program
- ☐ Zero Waste Events
- ☐ Other (please describe): _____
- ☐ None of the above
- ☐ I don't know

Q9. Before today, were you aware that UT Knoxville has a Campus Sustainability Master Plan?

- ☐ Yes
- ☐ No

Q10. Before today, were you aware that Chancellor Plowman's Zero Waste Commitment commits to diverting 50% of UT Knoxville's waste from the landfill by 2030?

- ☐ Yes
- ☐ No

Q11. What suggestions do you have for increasing the awareness of sustainability initiatives on the Knoxville campus?

Section II: Motivation

This section includes questions that seek to understand your motivation to participate or not participate in green behaviors at work. **Green behaviors** are actions and behaviors that are linked with and contribute to environmental sustainability. The goal of **environmental sustainability** is to conserve natural resources and to develop alternate sources of power while reducing pollution and harm to the environment. **Composting** is the natural process of recycling organic matter, such as leaves and food scraps, into a soil sediment that can improve the overall quality of the soil.

Q12. How important do you think it is to reduce the negative impact on the environment?

- ☐ Not important
- ☐ Slightly important
- ☐ Moderately important
- ☐ Important
- ☐ Very important

Q13. How important do you think it is for you to personally contribute to environmental sustainability?

- ☐ Not important
- ☐ Slightly important
- ☐ Moderately important
- ☐ Important
- ☐ Very important

Q14. How often do you participate in the following behaviors *outside of work*?

Scale: 1= Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Always, N/A = Not applicable

	Scale will be listed for each item in a matrix table
Compost food or yard waste	
Curbside recycling at my residence	
Donate or re-sell goods I no longer need	
Dispose of non-broken or reusable items I no longer need in the trash	
Drop off recyclable materials at designated recycling centers around town	
Eat a plant-based diet	
Implement energy saving techniques in my home (i.e., energy star appliances, energy-saving lighting, etc.)	
Reduce my consumption of single-use plastics	
Shop with a reusable bag	
Walk, bike, carpool, or take public transportation instead driving myself to run errands	

Q15. Please rate your level of agreement with the following statement: *I would be motivated to participate in green behaviors at work (recycling, composting, conserving energy, using a reusable mug, etc.) if my supervisor or department leadership encouraged or promoted participation in these behaviors.*

- ☐ Strongly disagree
- ☐ Somewhat disagree
- ☐ Unsure
- ☐ Somewhat agree
- ☐ Strongly agree

Q16. Please rate your level of agreement with the following statement: *I would be motivated to participate in green behaviors at work (recycling, composting, conserving energy, using a reusable mug, etc.) if observed coworkers participating in these behaviors.*

- ☐ Strongly disagree
- ☐ Somewhat disagree
- ☐ Unsure
- ☐ Somewhat agree
- ☐ Strongly agree

Q17. Please use the space below to describe what would motivate you to engage in more green behaviors at work.

Section III: Barriers

This section includes questions that seek to identify any barriers that may keep you from engaging in green behaviors at work.

Q18. Which one of the following barriers has the most impact on your participation in *recycling* while at work? (Choose only one)

- ☐ Don't feel it's my responsibility
- ☐ Inconvenient (not available in my office space)
- ☐ Lack of information (don't know what or where to recycle)
- ☐ Lack of time
- ☐ No barriers
- ☐ Other (please describe): _____

Q19. Which one of the following barriers has the most impact on your participation in *composting* while at work? (Choose only one)

- ☐ Don't feel it's my responsibility
- ☐ Inconvenient (not available in my office space)
- ☐ Lack of information (don't know what or where to compost)
- ☐ Lack of time
- ☐ No barriers
- ☐ Other (please describe): _____

Q20. Which one of the following barriers has the most impact on your participation in *conserving energy* while at work? (e.g., shutting down your computer at the end of the day, turning off lights, etc.) (Choose only one)

- ☐ Don't feel it's my responsibility
- ☐ Inconvenient
- ☐ Lack of information
- ☐ Lack of time
- ☐ No barriers
- ☐ Other (please describe): _____

Q21. Please use the space below to describe any additional barriers or reasons that might keep you from engaging in green behaviors while at work.

Section IV: Demographics

This section includes select demographic questions that will be used to describe participants in this study. If you do not want to answer any of these questions, please choose “prefer not to answer.”

Q22. What is your current employment status at UT Knoxville?

- ☐ Full-time
- ☐ Part-time
- ☐ Temporary
- ☐ Prefer not to answer

Q23. How long have you been working at UT Knoxville?

- ☐ 5 years or less
- ☐ 6 to 10 years
- ☐ 11 to 20 years
- ☐ 21 to 30 years
- ☐ 31 or more years
- ☐ Prefer not to answer

Q24. Which of the following describes your current work situation?

- ☐ On-campus
- ☐ Remotely
- ☐ Hybrid: combination of on-campus and remotely
- ☐ Prefer not to answer

Q25. Do you work in a specific college at the Knoxville campus?

- ☐ Yes
- ☐ No
- ☐ Prefer not to answer

Q26. Which college? (Display only if yes is selected in Q25)

- ☐ Agriculture
- ☐ Architecture and Design
- ☐ Arts & Sciences
- ☐ Business
- ☐ Communication & Information
- ☐ Education, Health, & Human Sciences
- ☐ Engineering
- ☐ Law
- ☐ Nursing
- ☐ Social Work
- ☐ Veterinary Medicine
- ☐ Prefer not to answer

Q27. In which of the following offices/departments/divisions do you work at the Knoxville campus? (Display only if no is selected in Q25).

- ☐ Academic Affairs
- ☐ Athletics
- ☐ Diversity & Engagement
- ☐ Enrollment Management

- ☐ Facilities Services
- ☐ Faculty Affairs
- ☐ Finance & Administration
- ☐ Human Resources
- ☐ Office of Information Technology (OIT)
- ☐ Office of Research, Innovation & Economic Development (ORIED)
- ☐ Public Safety
- ☐ Student Life
- ☐ Student Success
- ☐ University Libraries
- ☐ Vol Dining
- ☐ Other (please describe): _____
- ☐ Prefer not to answer

Q28. To which of the following generations do you belong?

- ☐ Silent Generation (born 1928-1945)
- ☐ Baby Boomer Generation (born 1946-1964)
- ☐ Generation X (born 1965-1980)
- ☐ Millennial Generation (born 1981-1996)
- ☐ Generation Z (born 1997-2012)
- ☐ Prefer not to answer

Q29. What is the highest degree or level of education you have completed?

- ☐ High school diploma or GED
- ☐ Vocational certificate (i.e., trade or tech school)
- ☐ Some college, no degree
- ☐ Associate degree
- ☐ Bachelor's degree
- ☐ Master's degree
- ☐ Doctorate or professional degree
- ☐ Prefer not to answer

Q30. Which of the following best describes your political beliefs?

- ☐ Consistently conservative
- ☐ Mostly conservative
- ☐ Mixed
- ☐ Mostly liberal
- ☐ Consistently liberal
- ☐ Prefer not to answer

Q31. What is your gender?

- ☐ Agender
- ☐ Gender fluid
- ☐ Gender non-conforming or non-binary
- ☐ Man
- ☐ Woman
- ☐ Another identity: _____
- ☐ Prefer not to answer

End of Survey

Thank you for participating in this survey!

To enter the random drawing for one of the forty (40) \$10 Golden Roast Coffee gift cards, please click [here](#).

If you have any questions about this research, please contact Nicole Jones at snicjo@utk.edu.
If you would like to learn more about how you can help UT Knoxville be more sustainable and meet its waste reduction goals, please visit: <https://sustainability.utk.edu>.



APPENDIX D: Informed Consent Form

Research Study Title: An Exploration of University Employees' Green Workplace Behaviors

Researcher(s):

S. Nicole Jones, University of Tennessee, Knoxville
Jennifer Ann Morrow, PhD, University of Tennessee, Knoxville

We are asking you to be in this research study because you are an employee at the University of Tennessee, Knoxville (UT). You must be 18 or older to participate in the study and your primary role at the university must not be a student. The information in this consent form is to help you decide if you want to participate in this research study. Please take your time reading this form and contact the researcher(s) to ask questions if there is anything you do not understand.

Why is the research being done?

The purpose of this dissertation research study is to better understand UT employees' awareness of and participation in campus sustainability initiatives. The results of this study will be used to help the UT Sustainability Office identify areas where additional environmental education is needed among UT faculty and staff.

What will I do in this study?

If you agree to be in this study, you will complete an online survey. The survey includes questions about your awareness, motivation, and any barriers to participating in UT sustainability initiatives. This survey should take you no more than ten (10) minutes to complete.

Can I say "No"?

Being in this study is up to you. You can stop up until you submit the survey. After you submit the survey, we cannot remove your responses because we will not know which responses are yours.

Are there any risks to me?

We don't know of any risks to you from being in the study that are greater than the risks you encounter in everyday life.

Are there any benefits to me?

We do not expect you to benefit from being in this study.

What will happen with the information collected for this study?

The survey is confidential, and no one will be able to link your responses back to you. Your responses to the survey will not be linked to your computer, email address, or other electronic identifiers. Information provided in this survey can only be kept as secure as any other online communication. The researcher is a member of UT's Committee for Campus Environment and results will be shared with that committee and with the Office of Sustainability. Some information collected for this study may be published and possibly presented at scientific meetings. No identifiable information will be used for this.

Will I be paid for being in this research study?

You may opt-in to a drawing for one (1) of forty (40) \$10 gift cards to Golden Roast Coffee. To enter this drawing, you will be asked to enter your name and university email address at the end of this survey. If you do not wish to complete this survey but would still like to enter the drawing, you may email Nicole Jones at snicjo@utk.edu. The odds of winning are based on how many people enter the drawing. We estimate odds of winning at 2:15 for 300 participants.

Who can answer my questions about this research study?

If you have questions or concerns about this study, or have experienced a research related problem or injury, contact the researchers Nicole Jones (snicjo@utk.edu) or Dr. Jennifer Morrow (jamorrow@utk.edu).

For questions or concerns about your rights or to speak with someone other than the research team about the study, please contact:

Institutional Review Board
The University of Tennessee, Knoxville
1534 White Avenue
Blount Hall, Room 408
Knoxville, TN 37996-1529
Phone: 865-974-7697
Email: utkirb@utk.edu

Statement of Consent

I have read this form, been given the chance to ask questions, and have my questions answered. If I have more questions, I have been told who to contact. By clicking the “Yes, I agree to participate” option below, I am agreeing to be in this study. I can print or save a copy of this consent information for future reference. If I do not want to be in this study, I can select the “No, do not want to participate” option below or close my internet browser.

APPENDIX E: Employee Suggestions for Increasing Awareness

Themes	Select Employees' Suggestions
Promotion/Marketing	<i>"More advertising. I did not know about most of these things."</i> <i>"Booth at all events to promote"</i> <i>"Contests/promotions and on-site visits to talk to faculty and staff also should be explored."</i> <i>"Have more messages about this come from the Chancellor."</i> <i>"Include campaign and marketing efforts to inform staff."</i>
Signage/Visibility	<i>"Signage and clearly marked bins"</i> <i>"More highly visible signage in academic buildings."</i> <i>"Post on bulletin boards."</i> <i>"Campus signage would be the most helpful, social media may not be the best tool, most of what I learned came from campus signage."</i> <i>"So far just seeing things around my building and office have been the most successful, so signs and actual physical infrastructure."</i> <i>"Put more recycle bins and trash cans throughout campus such as parking garages. I only see the bins in buildings. Nothing to help with everyday recycling for those who are in a building every day or who don't have an office."</i>
Emails/Newsletters	<i>"Email campaign educating folks."</i> <i>"More newsletters with stats and information of what's been going on."</i> <i>"More exposure through employee newsletters including departmental newsletters."</i> <i>"I am not sure if there is a newsletter, but I would love to receive something like that or more information in departmental newsletters."</i> <i>"Perhaps emails more clearly labeled as sustainable initiatives, rather than being rolled into general campus emails?"</i> <i>"A newsletter or occasional email reminding about these initiatives and where to go to do things."</i>
Training/Meetings	<i>"Materials for new employee orientations; more outreach about initiatives - maybe at the staff welcome picnic, and dept orientations in the fall."</i> <i>"A video training session about all of the initiatives and what that means for our community."</i>

	<i>"Include a presentation during HR's orientation for new hires; ask to present to different offices during their lunch break."</i> <i>"Annual required training on K@te."</i> <i>"Lunch and learns."</i>
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APPENDIX E: Employee Suggestions for Increasing Motivation

Themes	Select Employees' Suggestions
Easy access & convenience	<i>"Accessibility."</i> <i>"Convenience. I am not wasting my time to go far out of the way to be 'green'."</i> <i>"The fact that I have a tiny waste bin and a recycle bin makes it very easy for me to take part. I used to compost all the time in Seattle because they provided bins and collected the compost. I would do the same here if those were options."</i> <i>"Having more water bottle refill stations. Currently we have none in our office area."</i> <i>"Easy access to participate. For example, there is no battery recycling in my building on the Hill."</i> <i>"Visibility and ease of use. I currently only see recycling bins and water bottle fillers."</i>
More education & awareness	<i>"Part of motivation is the knowledge that something even exists. Put up signage in staff break rooms about different green behaviors that are easily accessible."</i> <i>"Info on disposal of compost."</i> <i>"Maybe have more information at staff picnics and such where it is more likely to grab people's attention."</i> <i>"Better understanding of ways to do so; programs that support green behaviors."</i> <i>"More information (or clearer information) about current programs and initiatives."</i>
Incentives	<i>"I already do participate in a lot of the initiatives i think people would be motivated by incentives."</i> <i>"Financial incentives. For example, I did not know the mug project gave discounts."</i> <i>"Money."</i> <i>"Rewards and group participation are very encouraging."</i> <i>"Rewards for engaging in green behaviors."</i>

Data	<i>"Seeing that stuff is actually recycled."</i> <i>"Knowing that it [recycling] isn't being put in the trash."</i> <i>"Indicate the value of individual actions (i.e. -- what are we saving by using hand dryers?"</i> <i>"Being provided with evidence/data of the fruits of our efforts."</i> <i>"I engage in green behaviors because I know our world only has so many resources and so much space, I am not influenced by others around me I am influenced by the data science behind why it's great to reduce, reuse, recycle."</i>
Office participation	<i>"Our office has adopted composting and Tiny Trash usage. Office-wide initiatives or contests might draw more into these behaviors."</i> <i>"More people doing it."</i> <i>"Others involved."</i> <i>"Seeing others do it."</i> <i>"If my department had stronger initiatives!"</i> <i>"If a campaign could get department buy in with a sustainability champion in each department that may be a way to bolster buy in."</i>
Competition/games	<i>"A fun competition."</i> <i>"Competitions for prizes, information about why my participation is important to the bigger picture."</i> <i>"Contest activities, educational workshops, campus projects."</i> <i>"Gamification of green behaviors at work: competitions."</i>
Leadership encouragement/support	<i>"My boss telling me it was okay would definitely motivate me the most, because it shows that I have the time and will not be judged against my work ethic taking the time to do it."</i> <i>"I do recycle and never by bottled water. Again, supervisors are very important in adopting sustainability as just the culture of what we do. I see paper boxes from frozen food in the garbage right next to the paper recycling in our break room."</i> <i>"More encouragement/reminders from department and campus administration."</i>

APPENDIX G: Additional Barriers to Engaging in Green Behaviors at Work

Theme	Related Participants' Quotes
Campus culture	<i>"Sometimes bosses discourage taking extra time to do something that the university pushes because it could take away from normal job duties."</i> <i>"It seems like no one else in my department turns off lights not in use, takes recycling seriously, so it's almost like What's the point if I am only 1 of 50 people doing this?"</i> <i>"Not emphasized as a priority."</i> <i>"Not an office culture that cares"</i> <i>"Complete lack of concern."</i> <i>"A lack of this behavior in coworkers."</i>
Skepticism	<i>"Don't believe my recycled items actually get recycled."</i> <i>"The environmental logic behind certain fads is unconvincing."</i> <i>"The climate catastrophe and everything shortage is already here, and it will continue to get worse. I'm not convinced that recycling helps at all. From what I understand, most of it ends up in the dump anyway."</i> <i>"I think people don't believe that the material in the bins is actually recycled."</i> <i>"With the energy-saving features of modern computers, I feel that shutting down my computer nightly simply wastes time twice a day, for virtually no real effect."</i>
Transportation issues	<i>"Lack of public transit."</i> <i>"No bike lanes to and from campus."</i> <i>"Trying to commute into work is not as possible from where I live, nor getting an electric vehicle. I can be more eco-friendly when I WFH."</i> <i>"I don't own an electric vehicle."</i> <i>"I live too far to walk/cycle to work."</i>

Frustration	<i>"I don't use My Tiny Trash because I find it extremely frustrating and inconvenient. Having a Tiny Trash can actually increases my NON green behavior."</i> <i>"The tiny trash is not really that efficient and actually makes me less likely to use it."</i> <i>"How to reduce the use of single-use plastics when everything one buys is wrapped in plastic??? Very frustrating."</i> <i>"Composting just makes a container that stinks in your office space. Shutting down my computer just makes me waste time every morning waiting to start work."</i> <i>"I do not compost because I do not like the smell or the flies."</i> <i>"I do think a few efforts are misguided and, to some, annoying such as the tiny trash can initiative. I think others such as the replacement of paper towels with hand dryers have unintended consequences (i.e. no paper towels available to enable people to clean up spills and the damage to hearing many say is caused by the noisy hand dryers)."</i>
Overflowing/lack of bins	<i>"When trashcans and recycle bins are overflowing, it keeps people from using them."</i> <i>"Building services needs to empty trash and recycling."</i> <i>"The lack of recycling bins outside."</i> <i>"Need more battery trash."</i> <i>"No place to recycle bottles."</i>
Work from home	<i>"Have to keep my computer on during the week to work from home."</i> <i>"I have to leave my pc on so I can remote access it."</i> <i>"Can't work from home if my office computer is off. Lights already turn off automatically in my office."</i>
Building issues	<i>"Building design of older campus structures and their building system."</i> <i>"I think there are a lot of unused spaces that have AC/heat on constantly- I try to turn them off or down when I see them."</i>

	<i>"I am in a building that get very hot due to steam heat so even in the winter I have to have a window unit cooling the space which seems ridiculous."</i> <i>"Seeing the university keeping the summer inside temperature at 68 degrees."</i>
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APPENDIX H: Letter of Support



May 26, 2022

To the Institutional Review Board at the University of Tennessee, Knoxville,

I am writing this letter of support for S. Nicole Jones' dissertation research. I am aware of her planned research that seeks to investigate UT employees' awareness of and participation in campus sustainability initiatives. As such, I am very interested in the results of that work, and give my full endorsement for her proposed research. The Office of Sustainability which I represent plans to utilize that data to improve our outreach efforts. We have worked with Nicole on another research project investigating students' interest in sustainable energy infrastructure for campus and she was an amazing partner in that endeavor.

If you have any questions or wish to discuss anything contained in this letter, please contact me at 865-200-7662 or jayprice@utk.edu.

Sincerely,



Jay Price
Sustainability Manager
Office of Sustainability
Facilities Services Department
University of Tennessee, Knoxville

VITA

Stephanie Nicole Jones is originally from southwest Georgia. She earned both a Bachelor of Science degree in Psychology and a Master of Education degree in College Student Affairs Administration from the University of Georgia. Since completing her master's degree, she has worked for 14 years in higher education in the areas of academic advising, academic and career coaching, and currently in program evaluation and assessment. Additionally, Nicole briefly left higher education and worked for 5 years in investigative and analytical roles at the FBI. In 2018, while working full-time at the University of Tennessee, Knoxville, Nicole began doctoral studies in the Educational Psychology and Research Ph.D. program, with a concentration in Evaluation, Statistics, and Measurement. She graduated from the program in December 2022.