

Zero Waste by Whom?

UC Berkeley's Zero-Waste Initiative and Its Impact on Campus Facility Employees

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ABSTRACT

In efforts to become more sustainable, institutions of higher education have focused on enhancing their waste management systems. Facilities staff such as custodial workers are highly impacted by waste management policies focusing on sustainability through campus operations and there is minimal research on worker experiences. In this study I look at the social impact of implementing sustainability efforts like UC Berkeley's Zero Waste plan. I conducted semi-structured interviews with ten custodial employees at the University of California, Berkeley. These interviews included questions on employee perceptions of the zero waste plan implementation and how they viewed themselves in it. Most of the changes made in the department were in infrastructure and signage, these changes proved ineffective in transitioning towards zero waste as the campus community still struggles to sort their waste properly. In addition, custodial workers felt that these changes brought an addition of labor which they were not recognized for. Furthermore, custodial employees experience social exclusion in the workplace. My findings suggest that this exclusion creates a sense of invisibility in the workplace and leads to a poor working environment. As custodial staff provide a critical service that is heavily relied on by the general community, their opinions and feedback should be prioritized.

KEYWORDS

sustainability, recycling, belonging, compost, operations staff

INTRODUCTION

With the growing concern over human drivers of climate change a wide range of institutions have made promises to become more environmentally friendly and sustainable (Lavey 2015). Institutions of higher education across the world have adopted different strategies to make their campuses more sustainable by integrating those values into their curriculum, research, and operational systems (Krizek et al. 2012). Integrating sustainability into universities has made campuses more environmentally conscious and aware of environmental issues with a wide range of initiatives that have succeeded in reducing waste and consumption. Universities such as Kun Shan University in Taiwan have minimized their water consumption and improved the efficiency of their water utilization by purifying and reusing their waste water (Kuo et al. 2018). In addition to waste reduction several universities have continued their efforts to become sustainable by enhancing their waste management systems (Armijo de Vega et al. 2003, Mason et al. 2003, Moqbel 2018, Smyth et al. 2010).

Efforts to enhance waste management systems have led to the adoption of the zero waste movement. Different organizations have their own interpretation of zero waste but most definitions largely include the goal of not producing unnecessary waste from a product at any stage of its life cycle. This is accomplished by reducing, reusing, recycling, and redesigning waste to avoid materials to become wasted or underused in a circular system (Song et al. 2015). Institutions of higher education have implemented waste management policies and adopted zero waste goals (Jiménez-Martínez and García-Barrios 2020, Mason et al. 2003). Yet while beneficial this stewardship comes at cost in terms of money and labor. The workers at the forefront of these movements are facilities employees that include custodial staff.

Custodial workers are highly impacted by waste management policies focusing on sustainability through campus operations. These service workers comprise a large vulnerable occupational group in the United States workforce (Smith and Anderson 2017). Custodial workers face a unique burden of hazardous work oftentimes without proper training and protective equipment and financial compensation (Village et al. 2009, Anderson and Marcum 2019). The University of California custodial staff are expected to sanitize and maintain campus property while incorporating the Sustainable Building Operations policy requirements (University of California 2020). Custodial staff take part in recycling, waste management, water conservation

and other environmental practices. They're the ones that turn off the lights and running water students leave behind and maintain the campus grounds. Custodial workers are environmental stewards yet there have been no published research studies that have evaluated the implementation of sustainability policies in university custodial departments.

Conditions such as language, immigration status, and physical and temporal segregation from daytime workers cause custodial workers to become invisible and therefore disregarded from associations with the organization they work for (Marotta 2019). This is seen on UC Berkeley's public report of information on their campus performance towards their sustainability goals. There is no information regarding the work of custodian workers in their assessment of their 12 performance categories (Berkeley Sustainability & Carbon Solutions). The engagement category, which focuses on the campus-wide community, mostly focuses on student engagement and sustainability education and not so much on their staff engagement. These workers are disregarded in the university's assessment of their progress towards sustainability. This has been a historic trend as university custodians have been overworked, underpaid and seen as invisible in academia (Hendrix 1998, Pettit 2008).

My goal for this study is to look at the social impact of implementing sustainability efforts like UC Berkeley's Zero Waste plan. My central research question is what is the effect of integrating sustainability practices in the workplace. To answer this question I conducted a case study on custodial staff at UC Berkeley. In doing so I ask:

- I) How has the zero waste goal changed the roles and expectations for custodial and landscape employees?
- II) How has working towards zero waste impacted custodial and landscape staff working experience?
- III) How do custodial workers see themselves in their workplace?

These questions will allow me to further analyze any gaps in the current process of integrating waste management practices that can be changed or adjusted to improve the realization of zero waste and wellbeing of workers. To answer these questions I collect information on changes in the workplace as well as feedback on the implementation of zero waste from custodial workers.

Zero waste at the University of California

The University of California (UC) is highly praised for its environmental stewardship; accordingly the University of California, Berkeley has adopted sustainability as one of its core values. In 2004 the UC released the UC Policy on Sustainable Practices which later evolved to include zero waste as a key sustainability goal. In 2013, Berkeley's Campus Recycling and Refuse Services and the Office of Sustainability created a zero waste plan to engage the campus community to send zero municipal solid waste to landfills to meet the UC zero waste goal (Lam et al. 2013). This plan was later updated to include strategies to upgrade standardized infrastructure in campus facilities, standardize and institutionalize zero waste practices, and educate the campus community on sorting and reusing materials (King et al. 2019). The Zero Waste by 2020 goal is defined to be a 90% diversion of municipal solid waste from landfill. This means that 90% of waste will go into streams like recycling or compost instead of landfill. To implement this goal the labor of the campus operations staff is vital.

Inclusion in the workplace

Feelings of belonging and inclusion are important for the wellbeing of employees. According to the social valuing perspective, employees measure their sense of worth and importance based on how others treat them (Dutton et al. 2016). A poor sense of inclusion at work is also associated with lower job satisfaction (Borrott et al. 2016, Skaalvik & Skaalvik 2011). Interactions with coworkers and employers can therefore offer opportunities for valuing and/or devaluing acts (Dutton et al. 2016). When employees feel valued, they report greater meaning in their work (Wrzesniewski et al. 2003). Studies have shown that social exclusion carries harmful consequences for direct targets as well as bystanders and broader society (Baumeister and Leary 1995, Hartgerink et al. 2015, Williams 2007) therefore invisibility and exclusion could bring negative consequences for employees' well-being. Maintaining and promoting the well-being of custodial workers is vital, not only for employees but also for the broader community who rely on their services.

METHODS

To obtain a holistic understanding of the custodial experience at UC Berkeley I conducted a case study. A case study was an appropriate research method for an empirical study that can provide quantitative data to reflect a contemporary phenomenon within its real-life context (Yin, 2009).

UC Berkeley Campus Case Study

This study is based on the UC Berkeley campus specifically the undergraduate residential halls, apartments, and campus buildings. UC Berkeley’s undergraduate housing is made up of seven dormitory units (Unit 1, Unit 2, Unit 3, Clark Kerr, Foothill, Stern, Martinez Commons, Blackwell) and six apartment buildings (Channing-Bowditch, Wada, Martinez Commons, Clark Kerr Apartments, New Sequoia, Garden Village) (Figure 1). All buildings are located on the south and northeast side of the main campus. Housing custodial staff are assigned to a specific unit and work in the buildings in that unit. Custodial staff that work in campus buildings are in a different department separated into six zones (Figure 2). These employees are part of a separate department and do not work with the housing custodians.

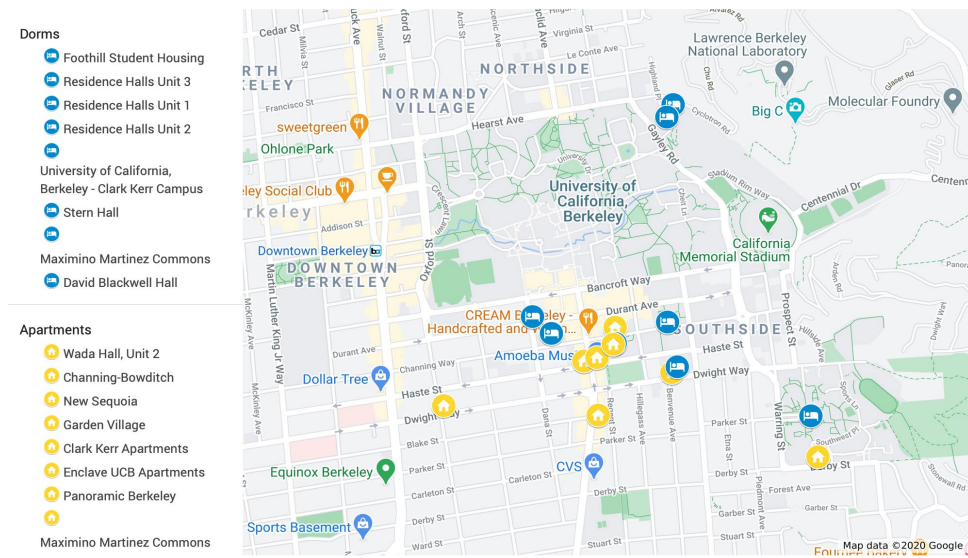


Figure 1. Map of UC Berkeley Undergraduate Housing. This map shows the different dormitories and apartments assigned to the custodians in the housing department.

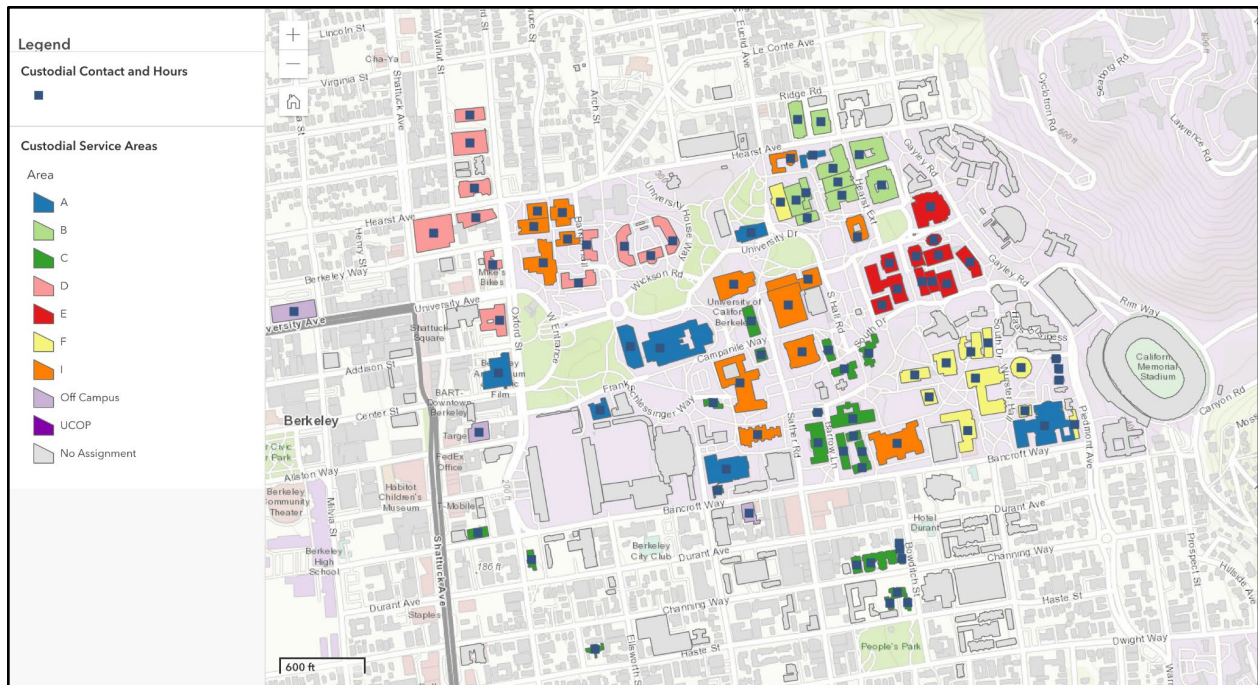


Figure 2. Custodial Zones in UC Berkeley Campus. This map shows the breakdown of the facility services custodial building assignments.

To gain as much background information as possible about UC Berkeley’s history with zero waste, I analyzed primary source documents. These documents include the 2020 UC Sustainable Practices Policy, the UC Berkeley 2009 Sustainability Plan, the 2019 UC Berkeley Zero Waste Plan, and the 2020 Campus Sustainability Plan. To understand how these efforts were put into place I met with a sustainability coordinator, a zero waste specialist, and a director of campus operations.

Interviews

To gain insight on the custodial experience, I interviewed custodial staff that had been working for UC Berkeley for at least 5 years as those employees would have experience working before the global pandemic and would best inform my study. To ensure that diverse perspectives were represented in the study, I conducted semi-structured interviews in English and Spanish. Using the participants’ first language in a qualitative interview was advantageous because it allowed participants to fully express themselves by minimizing language barriers and developing

a good rapport (Welch and Piekkari 2006). Each interview lasted from 40 to 60 min with questions that focused on the recent efforts to move towards environmental sustainability strategies, the employees' perception of the benefits and hurdles in executing zero waste practices, the employee's role and feeling of belonging in this plan, and recommendations on the implementation of environmental sustainability strategies. I interviewed campus and residence hall custodians, custodial directors, custodial leads & custodial supervisors.

Due to COVID-19 social distancing guidelines I gave participants the option of doing a virtual or phone interview instead of an in-person interview. To find interview participants, I met with a custodial supervisor and informed them about my study. They sent an email to their staff letting them know I was looking for participants.

Data Analysis

I used a thematic analysis to examine the interview data. I chose to use a thematic analysis due to its flexibility and potential to identify patterns in the data without a pre-existing theoretical framework (Braun and Clarke 2006). I transcribed the interviews and familiarized myself with the data to create preliminary ideas for codes that described the content. To code the responses of the interviewees, I grouped the responses beginning with the most common response, for example language barriers and student behaviors. After transcribing, I searched for patterns across the different interviews to assign codes. These codes were brief descriptions of important things said in the interviews. Once I coded my data I sorted my codes into themes. These themes were interpretation of the codes and the data. Once I identified themes I grouped notable quotes into their respective themes.

RESULTS

Participant demographics

I conducted 10 interviews with 5 custodians from the housing department and 5 custodians from the main campus. All participants have been working at UC Berkeley for at least 10 years, having been at UC Berkeley before zero waste became integrated on campus. Sixty percent of

participants had a managerial position such as custodial lead, custodial supervisor, or custodial director. The remaining 40% of participants were general custodians.

Implementation of zero waste

Most of the changes made in the department were in infrastructure and signage (Table 1). These changes include: adding a Max-R centralized collection unit set in place for indoor public centralized lobbies, entrances and exits, eateries, cafés and restaurants (Appendix A), a standardized slim jim set for breakrooms, kitchenettes, and common rooms, and a mini bin system for offices and cubicle spaces. In addition to changes in signage and infrastructure, staff in the dorms have had to change their trash removal schedules. The addition of compost presents a new waste stream for custodians to remove in larger volumes. They have had to increase the frequency of compost disposal because the compostable bags cannot hold a lot of weight and these bins get full quickly. Custodians are expected to be knowledgeable on this new waste management system and know how to sort the waste properly. In addition to this they are expected to maintain the new centralized waste stations and keep them clean.

Table 1. Changes made towards zero waste implementation.

Zero Waste Implementation	
Before	After
Old metal and rubber trash can	Standardized and color coordinated campus bins
Miscellaneous bins in buildings	Centralized sets of bins in common areas
General trash can in bathroom	Compost bins in bathroom
General trash bin in office and dorm rooms	Mini bin system and compost bins
Plastic liners for all trash bins	Compostable liner for compost bins
No signage on bins	Standardized signage on all bins
Emptying dorm dumpster once or twice a day	Emptying dorm compost wheeled carts multiple times a day

Interviews Themes

I identified three major themes from the interview responses (Table 2). These articulate the custodian's experiences at UC Berkeley and their perceptions of how the zero waste implementation is going. The selected quotations are shown for illustrative purposes; these are representative of each participant's views and experiences and have not been independently verified. Many themes and subthemes were interdependent, for example, lack of cooperation, invisibility, and interdepartmental communication all impacted the custodial workers' work environment and experience.

Theme 1: Implementation Effectiveness

Participants shared their views on the effectiveness of the transition towards zero waste. I identified two sub themes from their responses: perceived lack of cooperation and additional labor.

Nine out of ten interviewees mentioned a lack of cooperation from the campus community. Custodians that work in the residence halls work mainly with students in contrast to the campus custodians who serve the rest of the campus community and visitors so their responses were mostly about students. Several participants suggested that this lack of cooperation stemmed from a lack of knowledge and motivation and it created a frustrating work environment because their efforts seemed futile.

Four out of ten participants mentioned an increase in labor from the changes made to transition towards zero waste. One participant had a positive attitude towards the extra labor because it was for a good cause. Other participants were less optimistic and shared examples of times where they have had to carry out additional tasks that added to their workload. One participant mentioned that they felt these changes were inefficient for example when they have to use a plastic bag to line the compost bins to protect the bins from getting dirty when the compost bags rip. In addition two participants mentioned issues with the centralized waste stations specifically with the shape of the bins and the size of the openings. I noticed a difference in responses from general custodians and from custodians with a managerial position. The four participants that shared their experience with an increase in labor were general custodians from the residence halls as well as campus. Two participants in managerial positions said that they did

not consider these changes to bring on additional labor because the custodians still work the same amount of time.

Theme 2: Interdepartmental Communication

Responses about communication within both custodial departments were positive. Custodians shared that they felt comfortable reaching out to their supervisors to give feedback or ask questions. One of the main challenges I identified from the participants' responses was interdepartmental communication. For this theme I created two subthemes: team disengagement and barriers of communication.

Five out of ten participants mentioned the lack of communication and the need for collaboration between other departments. These participants were in a lead or supervisor role. General custodians did not have much to say about communication between departments. Participants that worked in the residence halls shared that they would like to see more collaboration from staff in residential life such as residential assistants and residential directors regarding educating the students on proper waste sorting. They believe that the signage provided by the zero waste department is not enough and does not encompass a lot of the trash that is being thrown out. One participant shared that they tried to have a residential life staff member include a training on zero waste in their meetings with the residential staff but the residential staff did not support them with that. Participants that worked on campus shared that they need better communication with other campus departments such as the food pantry, campus stores, and restaurants as these other departments are responsible for their own waste. One custodian implied that the lack of communication between their departments led to issues with the shared responsibility of waste disposal and that they wished that there was better leadership to facilitate those conversations. These workers believed that without the support of these departments their efforts were in vain because there continued to be issues with waste sorting.

Eight out of ten participants mentioned language as a barrier of communication. As stated by one custodian, many workers are “immigrants and are leery about bringing things up” thus revealing that in addition to language barriers there are also cultural barriers of communication. Consistent with these findings, ninety percent of the interview participants identified as people of color and fifty percent were immigrants. Participants shared that they did not feel comfortable

communicating directly with students because of language barriers and because they were afraid it would make things worse. One participant from the residential halls described an incident where they had asked a student not to waste water and that student got upset and created a mess in the restroom for them to clean up. Another participant shared that they used to have good communication with the residential assistants of the building they were assigned to, but since the pandemic they have lost that connection. They emphasized that this connection was important to them because that was how they best communicated with the students. Additionally, general custodians shared that they did not feel comfortable communicating directly with other departments, if they had any feedback or concerns they would relay it to their supervisors. I found that most of the custodial supervisors were bilingual and most of them had started off as general custodians. The communication between departments was between custodians with a managerial role and the other departments. One participant stated that custodial supervisors were not likely to oppose the zero waste department.

Theme 3: Experiences of exclusion

There was a noticeable difference in responses about feelings of belonging and invisibility between general custodians and custodians with a managerial position. Four out of the six custodians in a managerial position agreed when I asked if they felt like valued members of the UC Berkeley community. Two of the six managerial custodians and the four general custodians said they did not and shared instances where they felt excluded and unacknowledged. One example of this was with the implementation of the infrastructure, one participant stated that they were '*not consulted about the types of receptacles*' furthermore other custodians described issues with the receptacles. Hence, the exclusion from these decisions had a negative impact on their work environment that could have been prevented.

Table 2. Interview themes for custodial experiences

Theme	Sub Theme	Examples
Implementation Effectiveness	Perceived Lack of Cooperation	‘A lot of people just don't take recycling seriously’
		‘We put up the signage, we put new bins, but the students are still not sorting their waste’
		‘Lack of education and knowledge about how to properly sort waste definitely is one of the biggest issues’
		‘It's hard to say whether it will be effective,there's a big problem of cross-contamination’
		‘Custodians are on the front lines and we see how things really go, we get frustrated when we're trying to do our part and other people are not’
		‘They've been doing this [zero waste implementation] for a while and the students don't care... all they have to do is separate, it's easy’
		‘If they need an additional trash container or a bigger one they can let us know instead of overstuffing the bins’
		‘For us the implementation of the recycling is good, it's working good up to a certain point’ ‘Because the students are not doing it appropriately, then it leads to zero waste to blame the staff because they are not thinking beyond. First of all, how does it get there in the first place? Oh, yeah, students. That's where your separation is not happening’
	Additional Labor	‘They fill up fast and they overflow quickly... when you open up the doors of those units to remove them it's a pretty messy process. Food stuff and soda get spilled inside the units. So you have to get down on your hands and knees and clean out gunk... people don't want to do that’
		‘You have to lift weights that are in excess of the 50 pound weight that they say we're supposed to be able to lift’
		‘It is a little more work for us but it's for our wellbeing’
		‘The compost bags are super thin, we put a white plastic bag under the green compost bag so the bin does not get dirty’

		<p>‘That’s not actually more work because they’re not expanding their 8 hours and they’re not really going over their break times or lunch time’</p>
Interdepartmental Communication	Team Disengagement	<p>‘Custodians were never really consulted about the types of receptacles... the slim jims can be pretty difficult to empty’</p> <p>‘If we had more support from the RDs and the RAs, it’d be amazing’</p> <p>‘It would be so helpful if students could get a tour in the beginning of the semester with an overview of the waste stations’</p> <p>‘Here it’s called the student union but it’s a disunion because everyone works doing their own thing without caring about other people’s needs, it’s not a union’</p> <p>‘There needs to be better leadership between the departments, nobody wants to take responsibility for things’</p> <p>‘I’m not blaming the students. I’m blaming the people who have the opportunity to communicate to them, it’s not their fault’</p>
	Barriers of Communication	<p>‘All of the training documents are in English’</p> <p>‘It’s always a slow process with a big bureaucracy to get things changed. To get folks to listen to you, you need to be really persistent. You need to be able to speak English very well’</p> <p>‘Many of the workers in our custodial department are either immigrants or second-generation immigrants and are pretty leery about bringing things up. Some people aren’t. And those people become known as troublemakers’</p> <p>"A lot of people are under the impression that supervisors have a lot of power but really they don't, they don't have the final say, although they can be held responsible if they screw up, which is why most of them are very hesitant to make any kind of real decision about how things should be done...if there is resistance to the [zero waste] plan in our department the supervisors and managers would probably not voice their opposition"</p>
Experiences of Exclusion		<p>‘I feel that we are being rented over here’</p>

‘Upper management needs an understanding of language and an ability to actually listen... everybody is in such a hurry with a timeline for things to get done and when we're asking questions, they're basically trying to convince the person that whatever that person's thinking can't be done or there's a better way to do it... it's that way that upper management has already decided for us... it's all designed not to listen to the people who actually do the work’

‘I would like to know what projects they [zero waste department] have and want to implement because I don't really know what's going on’

‘We were here throughout the entire pandemic. They didn't view us as essential workers and we were not properly rewarded for our additional labor’

DISCUSSION

To understand the social impact of implementing sustainability efforts in the workplace, I interviewed custodial staff at UC Berkeley about their experiences with the implementation of the zero waste plan. My findings reflect that transitioning towards zero waste has increased the workload for custodial employees and impacted their work environment. As shown in my study, there is a need for better communication and collaboration between the housing and campus custodial departments and the departments that work alongside these employees. Moreover, without the support from other departments custodians perceive their efforts to be ineffective. My findings highlighted the need for shared responsibility and collaborative teamwork. Overall integrating zero waste into the workplace is functional but it's necessary for all stakeholders to be included even before the implementation process begins.

New expectations

Implementation of zero waste practices came with additional expectations for custodial employees. In addition to their cleaning responsibilities they were expected to be environmental stewards with knowledge on proper waste disposal. Participants shared their experience with the additional labor they encountered from these new practices. These findings are consistent with

studies that state that adding more waste streams for disposal requires additional labor (Armijo de Vega et al. 2003). No participant mentioned an additional compensation for this labor instead their responses suggested that they felt their efforts were not recognized. Additionally, some custodians with a managerial position failed to recognize the additional labor that the general custodians were doing because they still worked the same amount of hours. Studies show that this disregard of labor can be dangerous for custodians as it can elevate the risk of an occupational hazard and possibly intensify their workload (Rabelo and Mahalingam 2019), in addition this disregard contributes to a decrease in employee morale.

Campus-wide support

Custodial staff showed high commitment toward the zero waste plan, however findings suggest they did not feel the same commitment from the surrounding campus community. The lack of cooperation impacted their work experience because it led to additional labor. For instance, when people disposed of large trash, they often forced it into the small openings of the waste bins and when that trash contained any food or liquid it created a mess that the custodians needed to deal with. Moreover, the design of the receptacles is an important aspect in the implementation of new infrastructure. It's necessary to include the feedback that custodians have on the effectiveness of the receptacles because they know better than anyone else considering they work with them daily. Several studies highlight the importance of the involvement of staff and students for a successful implementation of a sustainability program (Dahle and Neumayer 2001, Keniry 1995, Mason et al. 2003). My findings support the conclusion that this collaboration is critical for a successful implementation of the zero waste plan.

Barriers of communication

Findings from the interviews suggest that there are language and cultural barriers of communication between the custodial department and the surrounding campus community. Although there was effective communication within the custodial department communication with other departments was lacking. Because the language barriers were minimized within the custodial department and there was a sense of familiarity in worker backgrounds, custodians felt comfortable

reaching out to their supervisors with feedback or concerns. My findings also show how power dynamics play a role as a barrier of communication. Although custodial supervisors receive feedback from their team there is not a safe environment for communication evident by the hesitation to relay information to a higher-up for fear of repercussions. This fear is also seen in dynamics between general custodians and students. These findings are consistent with studies that have shown how language and immigration status shape and often limit how workers are recognized at work (Marotta 2021).

Invisibility

The findings of this study show how the changes made to implement zero waste can present experiences of exclusion which lead to invisibility in the workplace. The participants' responses suggest that they believe the campus community is not educated on proper waste disposal practices or do not care enough to do it. This sentiment brings about a sense of invisibility for custodial workers as they perceive this behavior to stem from the community's lack of understanding or care for the implications that their actions have. This sense of invisibility is seen when custodians shared how they felt their work was insignificant. These feelings are consistent with studies that show how invisibility might feel like social devaluing (Dutton et al. 2016) and "interfere with the satisfaction of seeing the results of their work" (Ghidina 1992).

These findings further show how gaps and barriers in communication may reinforce power dynamics in organizations and broader society. Custodial narratives revealed how power relations may produce invisibility which led to a poor working environment. When the workers are left out of decision-making conversations, these decisions are not fully informed and can inadvertently cause problems for the workers. Furthermore, several custodians mentioned the ways that upper management's inaccessibility and lack of listening discouraged them from speaking up. Participant responses suggest that the designation of "troublemakers" for those who speak up, made people feel that their feedback was not valued and deterred others from expressing their honest opinions thus contributing to their exclusion. This exclusion rendered the custodians invisible in the workplace. These findings agree with Rabelo and Mahalingam's 2019 study in which they state that institutional practices and social representations of 'dirty' work produce various kinds of invisibility.

Recommendations

Instead of having the decision-making process at the upper management level with the tasks delegated down the organizational hierarchy, I suggest that for future projects departments should take a bottom-up approach and give the workers an opportunity to provide their input and have decision-making authority thus allowing them to feel engaged, included, and valued. Respecting the expertise and experiences of the workers should be considered as ignoring them further contributes to an environment of exclusion and invisibility. Several participants called attention to the need for zero waste education for the campus community. There are already initiatives on campus working on educating the campus community but their methods do not seem effective as students still do not know how to sort their waste. I recommend incorporating social media platforms like TikTok or Instagram with zero waste education to create quick informative videos that will cater to students' interests.

Limitations

My study population was with UC Berkeley employees, so I cannot apply my conclusions to employees at other campuses. My research would have benefited from more interviews as my sample size was limited to only 10 participants. To get a more representative sample it would have been ideal to have had at least one participant from each building. Another limitation was language, I was only able to conduct interviews in English and Spanish so that systematically excludes certain employees who feel more comfortable communicating in other languages. Lastly, the focus on a single occupation presents limitations about generalizability. For similar research in the future it would be beneficial to gather data from other facilities departments on campus that are working towards the zero waste goal.

Future directions

Some of the custodial staff shared their experiences of exclusion and invisibility on campus. Further research can be done to examine the role of race, ethnicity, gender, and age with these experiences. Additionally future studies should look into how students perceive their role in

the zero waste plan and gauge their understanding of the implications of zero waste. Further investigation could also be conducted to assess the perceptions and behavioral patterns towards waste disposal practices of the surrounding campus community.

Broader implications

Although previous research has identified the feasibility of implementing sustainable programs in institutions of higher education, in this study I not only examine its effectiveness but also the impact it has on the workers. Custodial staff are often from marginalized communities and often not paid as well and not given the job security that other staff are given. These folks are pushed to the outskirts of time and space due to the nature of their job and are asked to do these critical roles often without proper financial considerations. Campus Custodial Services as well as Housing Custodial Services move waste from the interior of the buildings to the external bins for pick-up and therefore play a key role in the implementation of the zero waste plan. It is important to create an inclusive work environment that is beneficial to their well-being. Maintaining and promoting the well-being of custodial workers is vital, not only for employees but also for the broader community who rely on their services. Additionally, there is value in educating the campus community not only to understand how to sort their waste but also on the impact of their contribution to the campus' waste management by way of the adoption of social responsibility towards the wider society beyond the campus. As custodial staff provide a critical service that is heavily relied on by the general community, their opinions and feedback should be prioritized.

ACKNOWLEDGEMENTS

I would like to thank Patina Mendez and the 175 teaching team for their guidance and constant support. I would also like to thank my friends and family for always listening to me and encouraging me throughout my thesis process. Finally, I would like to thank all of the employees who participated in my interviews and trusted me with their experiences.

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APPENDIX A: Zero Waste Infrastructure

Max-R Cabinet Set

These units are composed of four cabinets that contain the four different waste streams: compost, mixed paper, landfill, and cans and bottles. Unlike the old waste bins these receptacles have a standardized color and signage attached to them. They also have different sized openings based on the type of waste.



Slim Jim Set

This set consists of four separate bins that are color coded with lids. The lids have openings that are slightly larger than the Max-R cabinet sets. Laminated signs with examples of the corresponding waste stream are displayed on the side of each bin, along with a corresponding laminated sign on the wall directly above the bin.



Mini Bin Set

This set consists of a blue desk-side paper recycling bin with a saddle black landfill bin. Both bins are clearly labeled with standard Mixed Paper and Landfill stickers.



Compostable Liners

Compostable liners are biodegradable and used to line the compost bins.



Compost Bins

These bins are a standard green color and use compostable liners



Signage

These signs are used with waste bins to direct users to the appropriate bin for disposal.

<p>CANS & BOTTLES</p> <p>Aluminum Foil Cans Glass Plastic Bottles</p> <ul style="list-style-type: none"> • #1 and #2 plastics only • Glass bottles • Steel and aluminum cans • Water bottles 	<p>MIXED PAPER</p> <p>Scrap Paper Mail Newspapers Files</p> <ul style="list-style-type: none"> • Clean office or scrap paper • Flattened boxes and paper wrappings • Junk mail, newspapers, magazines • Post-it notes, tape, and staples • Please remove paperclips 	<p>COMPOST</p> <p>Food Waste Napkins Compostable Cups Compostable Plates and Straws</p> <ul style="list-style-type: none"> • All food scraps and waste • Meat, dairy, and cheese • Compostable cups and dining ware • Paper coffee cups • #7 PLA plastics 	<p>COMPOST</p> <p>Food Waste Napkins Compostable Cups Compostable Plates and Straws</p> <ul style="list-style-type: none"> • All food scraps and waste • Meat, dairy, and cheese • Compostable cups and dining ware • Paper coffee cups • #7 PLA plastics 	<p>LANDFILL</p> <p>Coffee Lids Styrofoam Plastic Bags Plastic Wrappers</p> <ul style="list-style-type: none"> • #3-7 plastics • Styrofoam • Coffee lids and straws • Snack wrappers and tea bags
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