School Food Waste Prevention and Collection:

Understanding Phoenix Public Schools' Interest and Challenges to Adoption

by

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A Thesis Presented in Partial Fulfillment

of the Requirements for the Degree

Master of Science, Sustainable Food Systems

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ABSTRACT

This research study seeks to determine demand for food waste reduction programs within Phoenix schools, while understanding the key obstacles preventing large-scale implementation. A literature review was conducted to examine school food waste challenges and potential solutions on a national scale. Concurrently, a digital research survey was distributed locally within public school districts in Phoenix, Arizona to understand different stakeholder perspectives in food waste programs by individuals who have witnessed a program in the past, present, or those who hope to be involved in a program in the future.

Representation from stakeholders across 15 Phoenix school districts indicated positive feedback from schools/districts that have taken steps to implement a food waste mitigation program. The results also suggest interest for school food waste mitigation for those who have never implemented a program, however, an uncertainty of where to start and fund these programs will need to be addressed to encourage city-wide adoption.

ACKNOWLEDGEMENTS

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BACKGROUND

Food waste is a significant environmental, social, and economic issue in the United States. Schools are a notable contributor to this problem. The meals distributed to children daily at schools result in large amounts of unintended food waste. Food waste from schools in the United States originates as a result of different factors. Inadequate time allotment to finish meals, large portion sizes, and student taste preferences are just a few factors that have a significant effect on this waste generation. According to the Environmental Protection Agency (EPA), K-12 schools in the United States wasted 1,248,532 tons of food in 2019 (EPA, 2023).

American schools generate a far larger portion of plate waste when compared to other developed countries. A recent study conducted by Penn State University found that American schools average 28-53% plate waste compared to other studies in Sweden, Italy, and Spain reflecting 23%, 20-29%, and 30%, respectively (Garcia-Herrero et. al, 2021). Food waste in American schools leads to the economic waste of approximately $1.7 billion every school year, for all the schools participating in NSLP alone (World Wildlife Fund, 2019). A significant portion of this waste is avoidable and could be mitigated through better waste management strategies. The goal of this research is to understand current mitigation strategies and limitations to food waste collection in schools across the nation.

LITERATURE REVIEW

Addressing food waste in schools requires a multifaceted approach driven by all stakeholders including educational programs, waste collection practices, and policy interventions. This literature review examines existing research on food waste collection in schools across the United States, highlighting challenges, existing strategies, and results associated with these practices.

Food Waste Collection Strategies

When food waste mitigation strategies are considered at the source, waste collection strategies can have a significant impact on food waste sent to landfills. The EPA released an updated version of their Food Recovery Hierarchy in October of 2023 highlighting a new wasted food scale as a guide for food waste solutions. The preferences show a focus in prevention as a most preferred strategy while landfilling is the least preferred due to the large contribution of methane produced by anaerobic digestion of food in landfills.

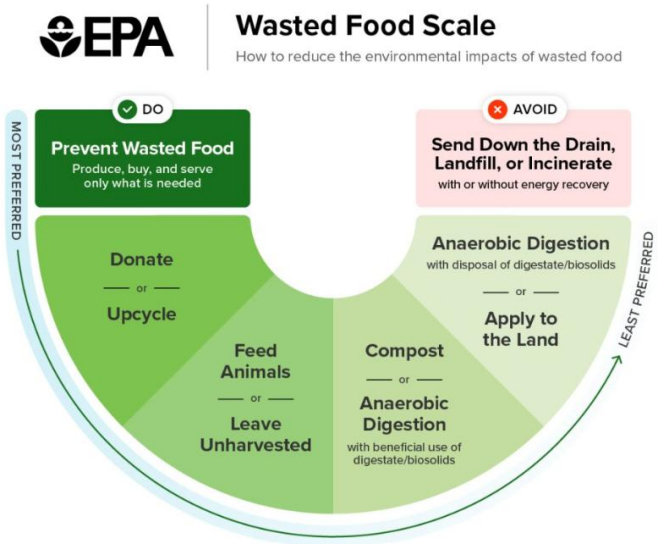

Figure 1: EPA Food Recovery Hierarchy (EPA, 2023)

Source Separation and Sorting

When prevention and donation strategies are not a viable solution for specific school programs, source separation is a key component any school can employ to manage their food waste. It involves the specific placement of different waste items at the point of disposal according to the waste destination. By implementing dedicated bins for food waste and educating students on proper disposal, schools can reduce landfill collections costs and divert the material to commercial compost facilities (Schwarz, 2017). A study conducted in 15 elementary and middle schools in the northeastern United States found the intervention of post-consumer source separation at the schools resulted in a 7% reduction in food waste (Elnakib et. al, 2021). The visual lesson for students is a key to remind them of their daily waste practices and offers an opportunity for them to acknowledge the need for change. A growing trend, visible in government, private, and non-profit research, showcases the ability for schools to adopt source separation as a viable option for food waste collection.

Figure 2: Hollis Primary School cafeteria source separation in New Hampshire (Happy, 2022).

Composting and Renewable Natural Gas Collection Programs

Composting is a widely practiced method for managing food waste. Schools across the U.S. have implemented composting programs on-site in school gardens or through partnership with commercial facilities to divert food waste from landfills and create valuable compost for use as a nutrient-rich soil amendment. Awareness of the issue and the empowerment of students, to be a part of the solution, directly influence the results of a food waste collection program. Involvement in the collections process and composting process provides educational opportunities for students to learn about the circular food system.

In locations where composting solutions are not directly available, schools are partnering with organizations to divert food waste into anaerobic food waste digesters for biogas production. In New York, a three-way partnership between Clarkson University, a local farm owned by the Cornell Cooperative Extension at Saint Lawrence County, and local schools formed an opportunity to create a food waste to energy project. The program utilized source separation to divert approximately 16 metric tons of food waste into the farm's anaerobic digester creating 3,400 cubic meters of biogas and saving the school district roughly $4,000 in the first three years of the program (DeWaters & Grimberg, 2022).

Procurement Changes

The procurement of school food items is often overlooked as a source of waste generation. School districts and/or their food service managers have strict guidelines to meet in order to qualify for free or reduced lunch programs. Schools participating in the

National School Lunch Program and School Breakfast Program must adhere to federal guidelines determined by the USDA, including nutritional standards, portion sizes, and eligibility criteria (USDA, 2017). These programs are critical to traditionally underprivileged schools represented by minority dominant populations. As a result, taste preferences may not be considered resulting in excessive food waste. Culturally sensitive food options play a significant role in increasing familiarity and therefore palatability of food to students (Cooke, 2007). School meals that emphasize familiar flavors and taste may be a key component to ensuring high meal consumption rates and reducing food waste at the source (Cohen et.al, 2021).

Challenges in Food Waste Collection

Behavioral and Educational Barriers

One significant challenge in implementing effective food waste collection is changing student behaviors and attitudes toward food waste. Redman & Redman suggest teachers are critical to student responses towards sustainable behaviors as they serve as a role model to the students. When a teacher exhibits low levels of knowledge and pays little attention to food and waste sustainability, the students are less likely to grasp sustainable behaviors our current education system and approaches reinforce unsustainable practices (Redman & Redman, 2013).

While students are generally receptive to sustainability education, translating this awareness into consistent waste reduction practices requires ongoing effort and reinforcement. Reinforcement of food system education is essential to drive the core principles of minimizing food waste through adulthood. One study found a 70%

reduction among middle school students in plate waste of salad bar vegetables between the control group and the intervention group that was exposed to standards-based curriculum on sustainable food systems (Prescott et. al, 2019). This emphasizes the need for schools to integrate comprehensive educational programs and incentives to encourage proper waste management.

Infrastructure and Resource Limitations

Many schools face constraints related to the infrastructure and resources necessary for effective waste collection. In an educational setting inadequate waste management infrastructure, experience, labor, and financial concerns can hinder the implementation of food waste collection programs (Musicus et al, 2022). Schools often need support from local governments and grassroots organizations to establish and maintain these systems (Wondmagegn, 2018).

Logistical and Operational Issues

Logistical issues often arise when employees lack clear guidelines and training for staff involved in waste management and their role in food waste mitigation programs. The Massachusetts Department of Environmental Protection emphasizes that buy-in must occur at the top level of administrators and staff in order to enforce adoption by individuals directly managing food operation in school cafeterias (MassDEP, 2022).

Operational challenges such as managing waste collection schedules, maintaining cleanliness, and handling contaminated waste can complicate food waste management efforts. Research indicated that employees in the food service sector with low levels of sustainability training are more likely to produce higher food waste in the kitchens

(Montesdeoca-Calderón, et al, 2024). Addressing these challenges requires well-coordinated efforts and clear operational protocols.

Case Studies and Examples

Businesses

R. City

R. City (formerly Recycled City) is a local business working to provide circularity in the food system through its waste-to-farm model. Residents, businesses, schools and more can utilize their collections services to haul leftover food waste back to their farm to be composted on-site, helping to grow more food free of synthetic fertilizers (R. City, 2024).

Figure 3: R. City food waste collections vehicle (R. City, 2024).

Non-profit Organizations

Let's Go Compost

Let's Go Compost is a 501(c)(3) non-profit organization local to the Phoenix Metropolitan Area. The organization provides free classroom composting materials and

curriculum to schools in Arizona. Through their Classroom Composting Program initiative, they "aim to enhance environmental literacy, foster a deeper understanding of waste reduction and recycling, and inspire the next generation of environmentally conscious citizens while ultimately reducing the amount of waste going from schools and to landfills" (Let's Go Compost, 2024). The organization's direct interaction with schools and the community cements itself as one of the many non-profit organizations making a difference in food waste mitigation at schools in Phoenix.

Figure 4: Let's Go Compost school food waste strategy (Let's Go Compost, 2024).

Local Government

City of Phoenix Public Works Department

The City of Phoenix Public Works Department successfully launched a school food waste pilot program in 2022 after being awarded a Composting and Food Waste Reduction grant from the USDA. The program was designed to minimize and capture food waste through education efforts and source separation on-site at five schools representing three school districts within Phoenix City limits. The schools diverted a total

of 75,722 pounds of compostable material to the City of Phoenix Compost Facility over the course of one full school year (Arizona Forward, 2024).

Following the expiration of the grant's funding, four of the five schools continue to participate in food waste collection after discovering how affordable it is to transition waste collection practices. The program serves as an example to other local schools in the ability to take the first step in minimizing food waste sent to landfills from schools.

Figure 5: City of Phoenix school food waste pilot program (Arizona Forward, 2024).

Educational Institutions

University of Arizona/Tucson Unified School District Partnership

Utilizing the same USDA grant funding as the City of Phoenix, the Tucson Unified School District has begun a food recovery program in collaboration with the University of Arizona School Garden Workshop and Compost Cats at 11 schools. In addition to infrastructure and programming aid, the program utilizes source separation to sort food waste to become usable compost on-site in school gardens. The district has collected more than 500 pounds of food waste in the early stages of the program, resulting in the creation of more than 100 cubic feet of compost for school gardens and

two professional development workshops on composting (Tucson Unified School District, 2024).

Conclusion

Food waste reduction in Arizona schools involves a range of strategies, including source separation, composting, and changes in procurement. While these initiatives have shown promise in reducing food waste and enhancing sustainability, challenges such as behavioral barriers, resource limitations, and logistical issues persist. Addressing these challenges requires continued effort, collaboration, and support from various stakeholders, including businesses, community organizations, government agencies, and educational institutions. Future research should focus on developing best practices, enhancing educational initiatives, and exploring innovative solutions to improve food waste management in schools.

METHODOLOGY

This research study utilizes a mixed-method survey approach to comprehensively understand the demand for and barriers to food waste collection in schools within the Phoenix city limits. Both quantitative and qualitative data were collected in the form of a digital survey to provide insight into the current situation and to guide future food waste management strategies.

Survey Development and Distribution

In order to quantify the demand for food waste collection and identify barriers, a structured survey was developed. The survey comprised closed-ended questions, including Likert scale items, ranking scale questions, multiple-choice questions, and open-ended questions (see Appendix B for all questions represented in the survey). Key survey areas included:

- Food Waste Collection Practices: Current or previous efforts to collect food waste for composting.
- Demand Indicators: Interest in adopting or enhancing food waste collection programs, perceived benefits, and willingness to participate.
- Barrier Identification: Financial, logistical, educational, and infrastructural challenges faced by schools.

The survey was distributed to the 24 public school districts within the Phoenix city limits across different school types and grade levels. Primary contacts included school district general contact email, child nutrition directors contact email, and food service providers' contact email, if applicable. The distribution was conducted via email

with follow-up reminders sent to maximize response rates (see Appendix A for email distribution details). Data collection occurred over a four-week period. Although public schools were the focus, an option for private and charter schools was included in case the survey was distributed to a private or charter school network.

Data Analysis

Representation from different school districts was critical to isolating geographical and demographic limitations. Themes and patterns were deduced from survey responses using statistical analysis. Correlation analysis was used to explore relationships between perceived barriers and demand indicators.

Limitations of the Methodology

According to the U.S. Census Bureau, Phoenix is the fifth largest city by population. With hundreds of schools located within Phoenix city limits, data collection from all schools would be a major undertaking that would require a longer data collection time frame. For the purpose of efficient data collection, school districts were targeted to receive comprehensive data that represent the interests of schools within the entire district. Individuals who were contacted were prompted to distribute the survey among their staff and it was incumbent on them to share the survey across their organization. Therefore, differing employee representation by the respondents was outside of direct control, yet welcomed as part of the research.

RESULTS AND ANALYSIS

The digital survey distributed in the four-week window yielded a total of 20 responses encompassing 15 of the 24 public school districts within Phoenix city limits, representing a district sample size of approximately 63% and a minimum of 72 schools. The respondents surveyed work in conjunction with schools averaging approximately 942 students per school, with a minimum of 381 and a maximum of 3,000 students. Their duties primarily consisted of student instruction (53%), meal operations (42%) , kitchen supervision (37%), and food procurement (32%). Other less common but notable duties included school administration (21%), and curriculum development (21%). The least common duty of those surveyed was waste management (16%).

Respondent Food Waste Background Knowledge

When asked about their background knowledge in food waste, respondents demonstrated small distinctions. In question number five (see Appendix B), participants averaged a score of 7.90 at home and 7.75 at school out of 10 in their familiarity with food waste issues. However, when asked similarly in question number 6 (see Appendix B) about their familiarity with food waste's social, environmental, and economic impacts, a decline in familiarity was found. Respondents averaged 6.15 at home and 6.40 at school. Although a minor decline, it is noteworthy that participants may be aware of the challenges of food waste but not as knowledgeable about the impact.

Participation in Food Waste Programs

Survey respondents shared their school/districts' participation in a food waste education, reduction, or collections program. Out of the 20 responses, 40% have never

considered, 20% currently participate, and 10% have participated in the past but do not have a current program in place. It was noted that 30% also were not aware of current or past participation in such a program.

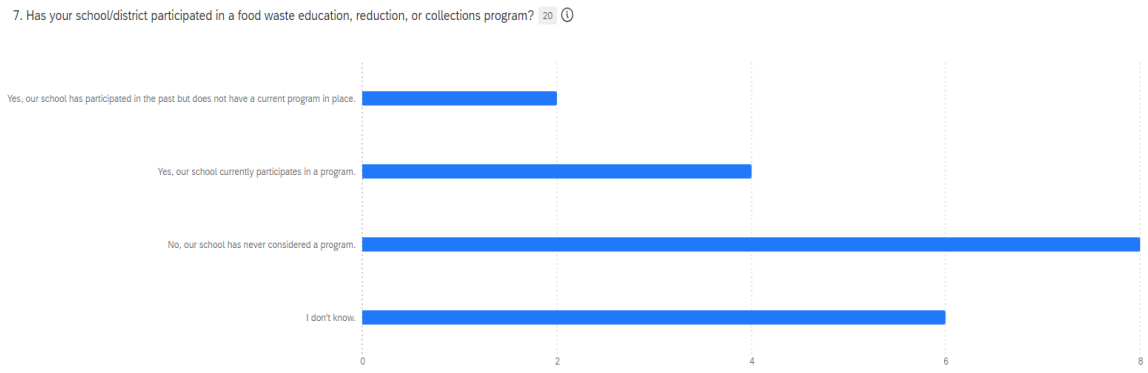

Figure 6: Participation in a food waste education, reduction, or collections program.

Current or Past Program Participation

Staff Involvement/Topics Discussed and Implemented

For those who indicated school/district current or past food waste program participation, members shared involvement of high (33%), moderate (33%), low (17%) or no involvement (17%), slightly favoring a moderate to high level of involvement. The major topics discussed and implemented included food waste reduction strategies (100%), composting basics (83%), a food waste overview (67%), and food waste collections/waste sorting (67%).

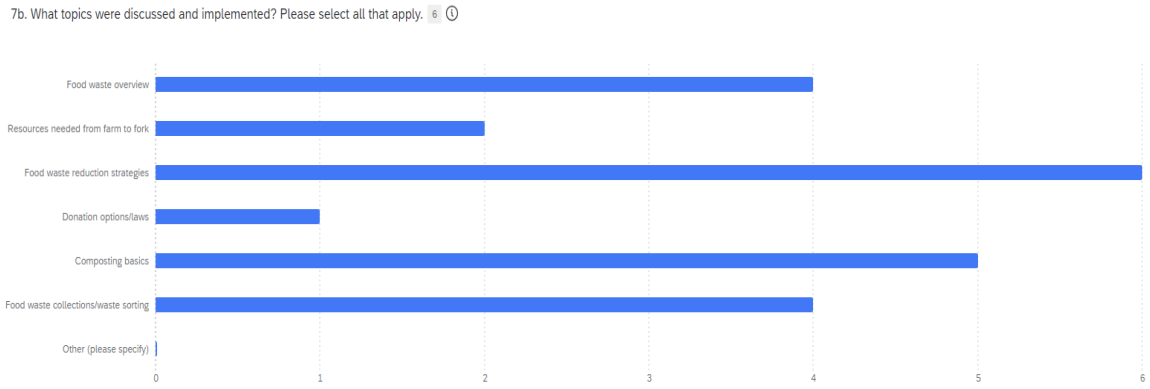

Figure 7: Topics discussed and implemented in a previous school food waste program.

Greatest Challenges

The top challenge indicated by respondents in their schools/district was time availability within existing curriculum in the classroom (60%). It was followed by an equal representation of responses of limited staff availability/high turnover, time/staff availability in the cafeteria, leadership presence, and an overall lack of awareness (40%). Other responses equally noted included financial concerns/funding availability for collections costs, availability of compost haulers, pest concerns, and odor concerns (20%).

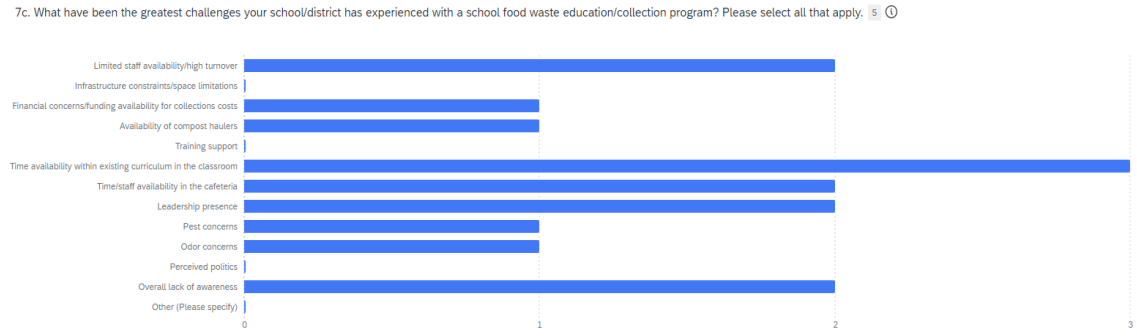

Figure 8: Greatest challenges in previous school food waste program.

In the following question, respondents detailed the significance of these challenges and their answers were tallied by their average significance. Limited staff availability/high turnover, overall lack of awareness, and financial concerns/funding availability for collections costs (1) were determined to be the most significant challenges. This was followed by odor concerns (2) and availability of compost haulers (2). Time/staff availability in the cafeteria (3), time availability within existing curriculum in the classroom (3), pest concerns (3), and leadership presence (3) finished tied for third.

Restart/Expansion Interest

Despite all challenges faced in the present or past in a food waste program, 83% of respondents in this category indicated their schools/district are extremely interested and 17% are somewhat interested in restarting or expanding the program. This suggests a positive experience with the program as an important educational tool.

No Previous Participation in a Food Waste Program

On the other end of the spectrum, respondents who indicated their schools/district have never participated in a program, yielded different responses. In determining level of interest in implementing a food waste program for these respondents, observations included extreme interest (21%), somewhat of an interest (36%), and no interest (43%). It is important to note the explanation given by respondents who selected no interest specified either “not sure if they would”, “I wish they can”, “I would like to start it”, and “the decision is not mine.” It can be inferred that a higher level approval of a program may be needed.

Greatest Obstacles

Similar to question 7c (see Appendix B), when asked about the obstacles preventing a food waste program the following results were found. Respondents selected training support/not sure where to get started as the most common obstacle (88%). This was followed by limited staff availability/high turnover (63%), pest concerns (63%), time/staff availability in the cafeteria (63%), and financial concerns/funding availability for collections costs (63%). Other notable responses included availability of compost haulers (50%), time availability within existing curriculum (50%), leadership presence (50%), odor concerns (50%), infrastructure constraints/space limitations (50%), and overall lack of awareness (50%).

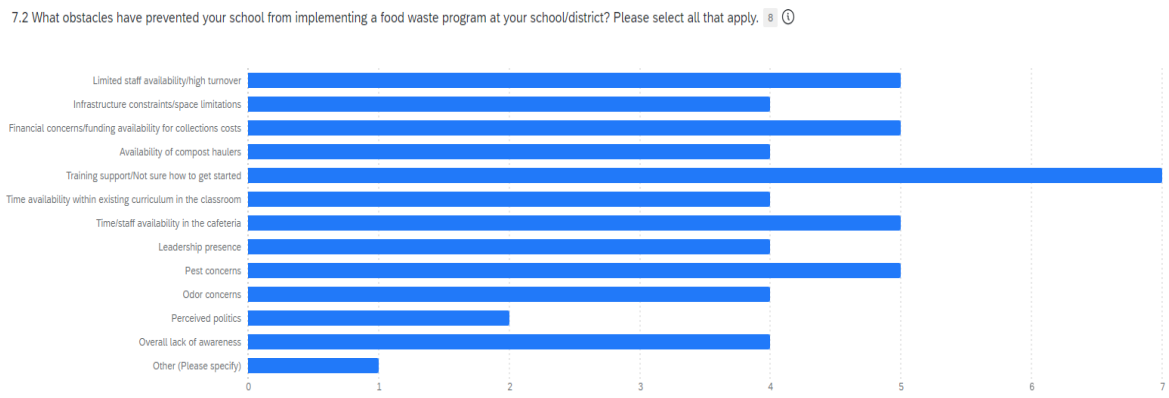

Figure 9: Greatest challenges preventing implementation of a school food waste program.

The obstacles ranked in the following order based on the average significance with the lowest number representing the most significant: Time availability within existing curriculum (2.75), training support/not sure where to get started (3.14), limited staff availability/high turnover (3.6), overall lack of awareness (4.25), financial concerns/funding availability for collections costs (4.4), and leadership presence (4.5).

Employee Support, Decision-Making Power, Financial Support

Question 8 in the survey gauged individual support or apprehension to a food waste program (see Appendix B). 94% responded they would be willing to support a food waste education and collections program. This was then followed by question 9 (see Appendix B) to determine their decision-making power. A majority of individuals would need to seek approval for consideration (61%), followed by individuals that assist with new school program implementation (17%), those not available to assist with implementation (11%), and lastly those that are on the team that approve new school programs (11%).

Financial support for a food waste program was determined with the final responses. Based on their knowledge, a majority would be dependent on grant funding (60%), followed by those that would have some funding available/would need to seek additional grant funding (33%), and would have funding available (7%).

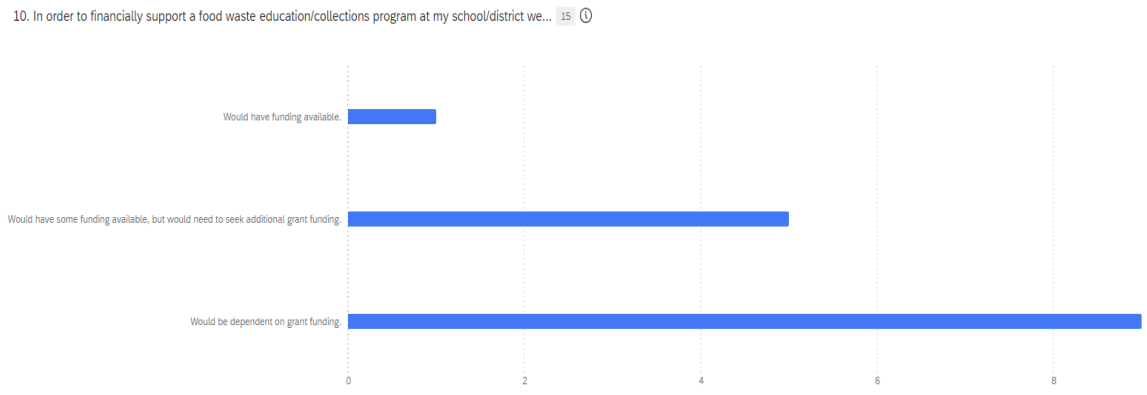

Figure 10: Financial support needed to support a school food waste program.

Analysis and Recommendation

Based on the findings of those who currently or previously have participated in a food waste program, the opportunity has been a positive experience while some challenges jeopardize the future continuation or consideration of restarting a food waste program. On the other hand, the unknowns of starting a program from scratch without external support present a barrier to schools/districts considering launching a new program. Shared concerns that generated mid-level concern by both groups of respondents included limited staff availability/high turnover and time/staff availability in the classrooms and cafeteria. This suggests that adequate staffing/retention plays a large role in the success of these types of programs. Arizona was ranked last in education in the United States in 2023 as a result of funding and overall education spending (Education Data Initiative, 2023). It can be inferred that the root cause of less and limited success of specialty programs is the direct result of improper funding allocation away from schools in Phoenix.

As indicated by the survey results, there is support and interest for food waste programs and initiatives by employees, but they are hampered by external factors outside of their direct control. It is my recommendation that grant funding initiatives are allocated to specialty food waste programs in the form of awareness campaigns and pilot programs. We have seen the success of this effort in local Phoenix programs to mitigate food waste in schools. Local government departments, non-profit organizations, and educational institutions have provided adaptable solutions for schools in Phoenix to consider and implement. Continued funding to schools will alleviate pressure from external organizations from being the determining factor to the success of these programs.

CONCLUSION

In summary, interest and demand by Phoenix schools does exist for incorporating food waste prevention and reduction strategies. The research suggests Phoenix school stakeholders are looking for opportunities to mitigate food waste, however, there is a shared feeling of being unsure where to get started and if there are enough resources available to enact permanent solutions. An overall growing awareness of food waste by adults is aiding the increase in school food waste programs developing, however, awareness still is in the early stages.

While grant funding does exist to launch pilot programs, schools/districts may be apprehensive to start a school food waste program given the uncertainty of future funding. Limited time in the classrooms and cafeterias hinder the availability of staff to support and reinforce food waste mitigation strategies. Increased funding to Arizona schools can be pivotal in supporting educational programs inside and outside of the classroom in a variety of topics. Continuous education campaigns centered around food waste introduced by local government, businesses, educational institutions, and non-profit organizations will also be essential to gaining school stakeholder involvement in such programs. A future without food waste in schools is possible. Increased school funding, food waste educational campaigns, and determined leadership by key school officials will catapult Phoenix schools to zero food waste.

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APPENDICES

Appendix A: Survey Recruitment via Email

Hello,

My name is Kaysey England and I am a graduate student under the direction of Professors Joe Dobrow and Kathleen Merrigan in the College of Global Futures at Arizona State University. I am conducting a research study to gauge interest in school food waste collection and reduction programs within Phoenix city limits, while gaining an understanding of the challenges to adoption.

I am inviting you and anyone among your school/district staff to participate, which will involve an anonymous 10-minute online survey to learn about the challenges and opportunities of school food waste collection programs. All staff members must be 18 years or older to participate. The questions will be multiple choice with optional open-ended opportunities. You have the right not to answer any question, and to stop participation at any time.

Your participation in this study is voluntary. If you choose not to participate or to withdraw from the study at any time, there will be no penalty. There are no direct benefits or compensation for your involvement in this study. There are no foreseeable risks or discomforts to your participation.

Your responses will be anonymous. The results of this study may be used in reports, presentations, or publications but your name will not be used.

You can complete the SURVEY at your earliest convenience. Thank you so much for your time and consideration of this important research study. Please reach out to me if you have any questions or concerns.

Kind Regards,

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530-312-3859

Appendix B: Survey Questions

The purpose of this survey is to measure demand for school food waste collection efforts within Phoenix City limits. The information will be used to guide future food waste diversion/composting initiatives. All data collected will be used anonymously in an Arizona State University College of Global Futures Graduate Student Capstone Report. You must be 18 years or older to participate. Required questions are noted with an asterisk*.

1. Please select the school district(s) you serve. *

- [ ] Alhambra
- [ ] Balsz
- [ ] Cartwright
- [ ] Cave Creek Unified
- [ ] Creighton
- [ ] Deer Valley Unified
- [ ] Fowler
- [ ] Glendale Union
- [ ] Isaac
- [ ] Kyrene
- [ ] Laveen
- [ ] Littleton
- [ ] Madison
- [ ] Murphy
- [ ] Osborn
- [ ] Paradise Valley Unified
- [ ] Pendergast
- [ ] Phoenix Elementary
- [ ] Phoenix Union
- [ ] Roosevelt
- [ ] Riverside
- [ ] Union Elementary
- [ ] Washington
- [ ] Wilson
- [ ] Charter School
- [ ] Private School
- [ ] Other (Please Specify)_____

2. Please write the school(s) you serve. *

_____

3. What is your school's total approximate enrollment? Please average the enrollment if you are answering on behalf of a district. *

	0 500 1000 1500 2000 2500 3000
Total Enrollment Number ()	

4. Which of the following does your job entail?

- [ ] School Administration
- [ ] Food Procurement
- [ ] Waste Management
- [ ] Meal Operations
- [ ] Kitchen Supervision
- [ ] Curriculum Development
- [ ] Student Instruction

5. On a scale from 1-10, with 1 being the lowest and 10 being the highest, how familiar are you with the issues associated with food waste... *

	Not familiar at all / Moderately familiar / Extremely familiar 1 2 3 4 5 6 6 7 8 9 10
At Home ()	
At School ()	

6. On a scale from 1-10, with 1 being the lowest and 10 being the highest, how knowledgeable are you of food waste's social, environmental, and economic impact in the community... *

	Not knowledgeable at all					Moderately knowledgeable				Extremely knowledgeable
	1	2	3	4	5	6	6	7	8	9	10
At Home ()											
At School ()											

7. Has your school/district participated in a food waste education, reduction, or collections program? *

- Yes, our school has participated in the past but does not have a current program in place.
- Yes, our school currently participates in a program.
- No, our school has never considered a program.
- I don't know.

Display This Question:

If QID10 = Yes, our school has participated in the past but does not have a current program in place.

Or QID10 = Yes, our school currently participates in a program.

7a. What was your level of involvement with a food waste program?

- ○ High involvement (led the program)
- ○ Moderate involvement (helped facilitate the program and assisted with education efforts)
- ○ Low involvement (assisted the program only when assigned)
- ○ No involvement (aware of the program but the program did not intersect with my daily responsibilities)

Display This Question:

If QID10 = Yes, our school has participated in the past but does not have a current program in place.

Or QID10 = Yes, our school currently participates in a program.

7b. What topics were discussed and implemented? Please select all that apply.

- ☐ Food waste overview
- ☐ Resources needed from farm to fork
- ☐ Food waste reduction strategies
- ☐ Donation options/laws
- ☐ Composting basics
- ☐ Food waste collections/waste sorting
- ☐ Other (please specify) _____

Display This Question:

If QID10 = Yes, our school has participated in the past but does not have a current program in place.

Or QID10 = Yes, our school currently participates in a program.

7c. What have been the greatest challenges your school/district has experienced with a school food waste education/collection program? Please select all that apply.

- ☐ Limited staff availability/high turnover
- ☐ Infrastructure constraints/space limitations
- ☐ Financial concerns/funding availability for collections costs
- ☐ Availability of compost haulers
- ☐ Training support
- ☐ Time availability within existing curriculum in the classroom
- ☐ Time/staff availability in the cafeteria
- ☐ Leadership presence
- ☐ Pest concerns
- ☐ Odor concerns
- ☐ Perceived politics
- ☐ Overall lack of awareness
- ☐ Other (Please specify) _____

Display This Question:

If QID10 = Yes, our school has participated in the past but does not have a current program in place.

Or QID10 = Yes, our school currently participates in a program.

Carry Forward Selected Choices from ""

7d. Please drag and rank the challenges selected by significance (1 equals most significant, highest number equals least significant).

_____ Limited staff availability/high turnover
_____ Infrastructure constraints/space limitations
_____ Financial concerns/funding availability for collections costs
_____ Availability of compost haulers
_____ Training support
_____ Time availability within existing curriculum in the classroom
_____ Time/staff availability in the cafeteria
_____ Leadership presence
_____ Pest concerns
_____ Odor concerns
_____ Perceived politics
_____ Overall lack of awareness
_____ Other (Please specify)

Display This Question:

If QID10 = Yes, our school has participated in the past but does not have a current program in place.

Or QID10 = Yes, our school currently participates in a program.

7e. How interested is your school/district in restarting or expanding a food waste education/collections program?

- Extremely Interested (Ready to incorporate new tools to the program)
- Somewhat Interested (Willing to incorporate new tools, but is not a priority)
- Not Interested (Please explain why)_____

Display This Question:

If QID10 = No, our school has never considered a program.

Or QID10 = I don't know.

7.1 How interested is your school/district in implementing a food waste education/collections program?

- Extremely interested (Ready to learn next steps when service is available)
- Somewhat Interested (Open to starting a conversation for consideration)
- Not interested (Please explain why) _____

Display This Question:

If QID10 = No, our school has never considered a program.

7.2 What obstacles have prevented your school from implementing a food waste program at your school/district? Please select all that apply.

- ☐ Limited staff availability/high turnover
- ☐ Infrastructure constraints/space limitations
- ☐ Financial concerns/funding availability for collections costs
- ☐ Availability of compost haulers
- ☐ Training support/Not sure how to get started
- ☐ Time availability within existing curriculum in the classroom
- ☐ Time/staff availability in the cafeteria
- ☐ Leadership presence
- ☐ Pest concerns
- ☐ Odor concerns
- ☐ Perceived politics
- ☐ Overall lack of awareness
- ☐ Other (Please specify) _____

Carry Forward Selected Choices from ""

7.3 Please drag and rank the obstacles selected by significance (1 equals most significant, highest number equals least significant).

_____ Limited staff availability/high turnover
_____ Infrastructure constraints/space limitations
_____ Financial concerns/funding availability for collections costs
_____ Availability of compost haulers
_____ Training support/Not sure how to get started
_____ Time availability within existing curriculum in the classroom
_____ Time/staff availability in the cafeteria
_____ Leadership presence
_____ Pest concerns
_____ Odor concerns
_____ Perceived politics
_____ Overall lack of awareness
_____ Other (Please specify)

---

8. Would you personally be willing to support food waste education and collection programs efforts at your school/district? *

- Yes, I would be willing to assist this program.
- No, I would not be willing to assist this program.

---

9. Please describe your decision-making power to implement a food waste program at your school/district. *

- I am on the team that approves new school programs.
- I would need to seek approval for consideration.
- I assist with new school program implementation.
- I am not available to help with new school program implementation.

Display This Question:

If QID20 = I am on the team that approves new school programs.

Or QID20 = I would need to seek approval for consideration.

Or QID20 = I assist with new school program implementation.

9a. How much would would be the maximum your school would be willing to PAY PER MONTH for weekly food waste collections to be composted at a commercial facility?

- Under $50
- $51-$75
- $76-$100
- $101-$125
- $126-$150
- $151-$175
- $176-$200
- Over $200
- I don't know.

Display This Question:

If QID20 = I am not available to help with new school program implementation.

9b. If you could estimate, how much would be the maximum your school would be willing to PAY PER MONTH for weekly food waste collections to be composted at a commercial facility?

- Under $50
- $51-$75
- $76-$100
- $101-$125
- $126-$150
- $151-$175
- $176-$200
- Over $200
- I don't know.

10. In order to financially support a food waste education/collections program at my school/district we...

- Would have funding available.
- Would have some funding available, but would need to seek additional grant funding.
- Would be dependent on grant funding.

Optional: How much does your school pay for landfill disposal fees per month? Who is your current landfill waste hauler?

_____

Optional: Do you have any questions or comments you would like to add?

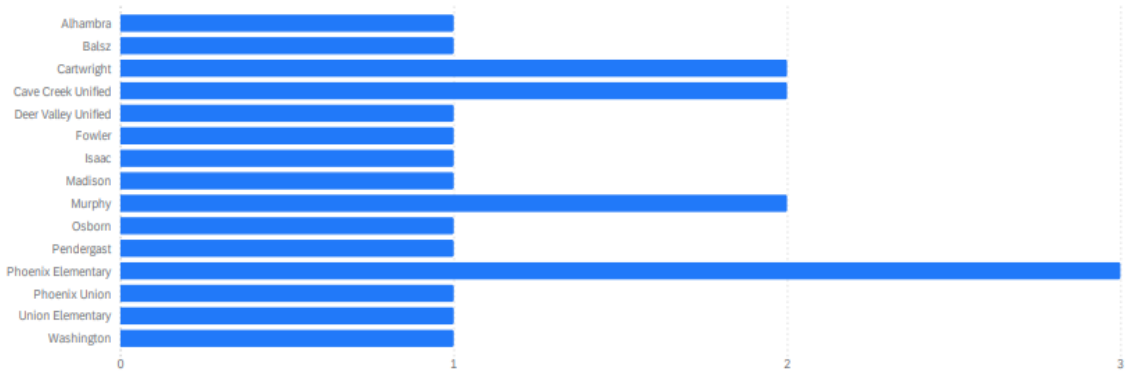
_____

If you would like to be put on a mailing list to receive a copy of the report and other updates entailing food waste collection consideration opportunities in Phoenix in the future, please email Kaysey England at Kenglan2@asu.edu.

_____

Appendix C: Survey Results

1. Please select the school district(s) you serve. 20



1. Please select the school district(s) you serve. 20

QID1 - 1. Please select the school district(s) you serve. - Selected Choice	Percentage	Count
Alhambra	5%	1
Balsz	5%	1
Cartwright	10%	2
Cave Creek Unified	10%	2
Deer Valley Unified	5%	1
Fowler	5%	1
Isaac	5%	1
Madison	5%	1
Murphy	10%	2
Osborn	5%	1
Pendergast	5%	1
Phoenix Elementary	15%	3
Phoenix Union	5%	1
Union Elementary	5%	1
Washington	5%	1

2. Please write the school(s) you serve. 20

2. Please write the school(s) you serve.

Tillman, Brunson-Lee, Crockett, Griffith, Orangedale

Sonoran Trails Middle School

Whole District

Hamilton, Sullivan and Kuban

DSA

2. Please write the school(s) you serve.

At 12 Pendergast schools

Palm Lane

All 32

Garfield

Norterra Canyon

Fowler, Sunridge, Santa Maria, Sun Canyon, Western Valleys, Tuscano

Dos Rios, Hurley Ranch, Union Elementary

Joseph Zito Elementary

Camelback HS

Garfield Elementary

William R Sullivan & Jack L Kuban

Catalina Ventura

Garfield Elementary

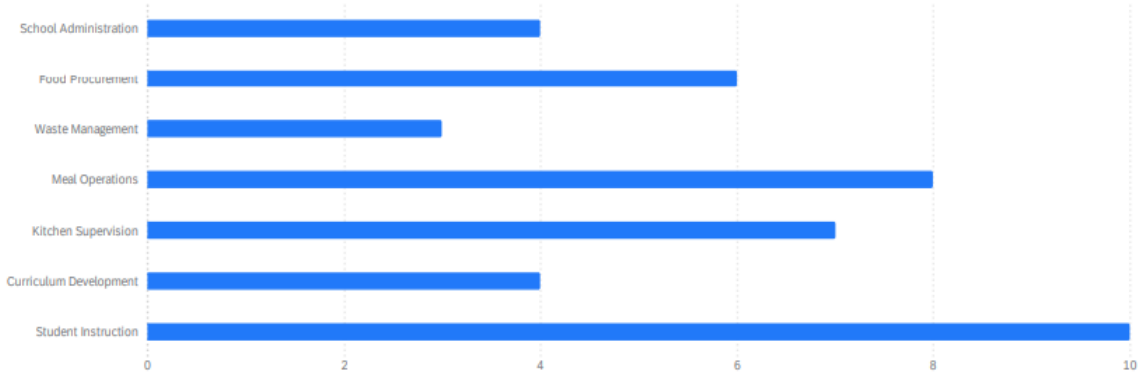
Encanto Elementary

ASU Prep Academy, Estrella Middle school, Harris Elementary School, Little Big Minds

3. What is your school's total approximate enrollment? 20

3. What is your school's total approximate enrollment?	Average	Minimum	Maximum	Count
Total Enrollment Number	942.60	381.00	3,000.00	20

4. Which of the following does your job entail? 19



4. Which of the following does your job entail? 19

QID5 - 4. Which of the following does your job entail?	Percentage	Count
School Administration	21%	4
Food Procurement	32%	6
Waste Management	16%	3
Meal Operations	42%	8
Kitchen Supervision	37%	7
Curriculum Development	21%	4
Student Instruction	53%	10

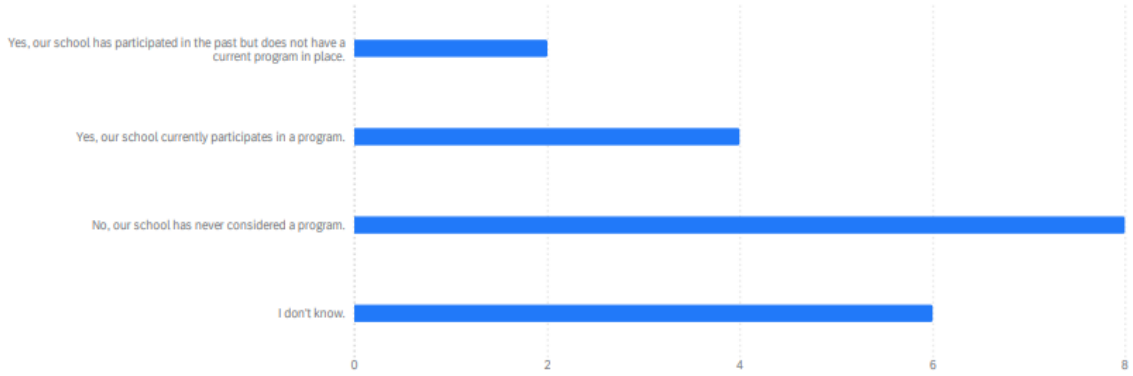
5. On a scale from 1-10, with 1 being the lowest and 10 being the highest, how familiar are you with the issues associated with food waste... 20

5. On a scale from 1-10, with 1 being the lowest and 10 being the highest,...	Average	Minimum	Maximum	Count
At Home	7.90	1.00	10.00	20
At School	7.75	1.00	10.00	20

6. 5. On a scale from 1-10, with 1 being the lowest and 10 being the highest, how knowledgeable are you of food waste's social, environmental, and economic impact in the community... 20

6. 5. On a scale from 1-10, with 1 being the lowest and 10 being the highes...	Average	Minimum	Maximum	Count
At Home	6.15	3.00	10.00	20
At School	6.40	2.00	10.00	20

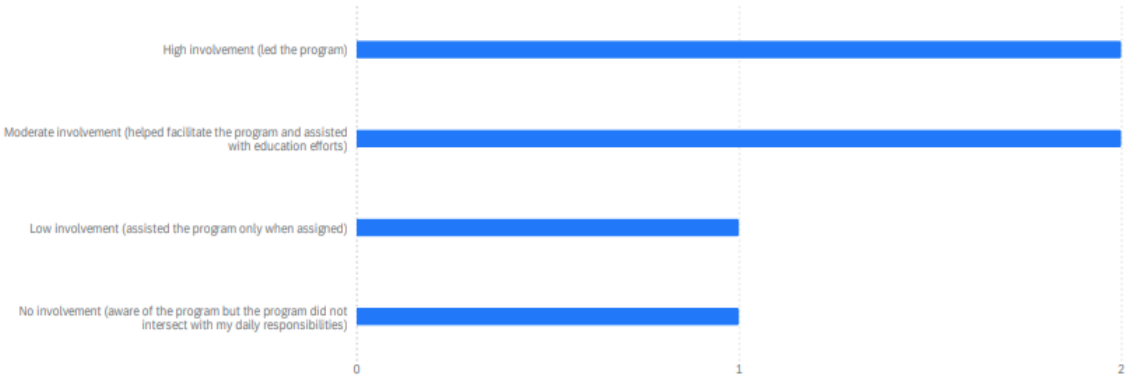
7. Has your school/district participated in a food waste education, reduction, or collections program? 20



7. Has your school/district participated in a food waste education, reduction, or collections program? 20

QID10 - 7. Has your school/district participated in a food waste education, reduction, or collections program?	Percentage	Count
Yes, our school has participated in the past but does not have a current program in place.	10%	2
Yes, our school currently participates in a program.	20%	4
No, our school has never considered a program.	40%	8
I don't know.	30%	6

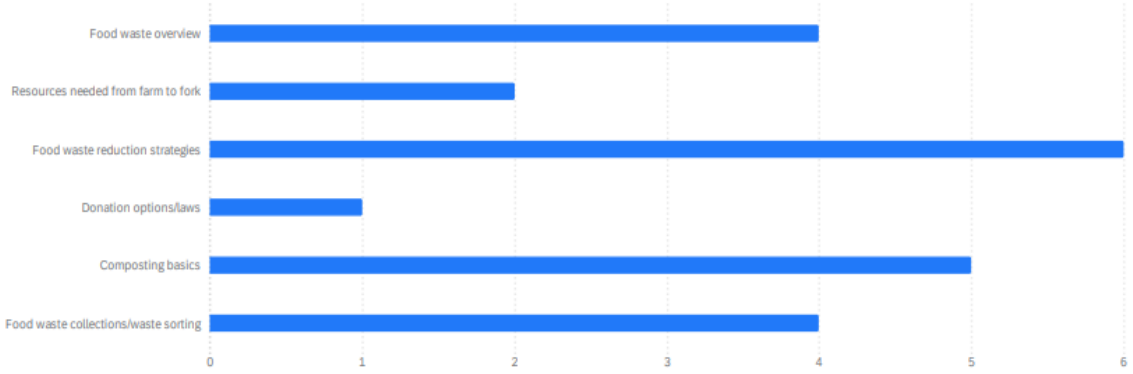
7a. What was your level of involvement with a food waste program? 6



7a. What was your level of involvement with a food waste program? 6

QID11 - 7a. What was your level of involvement with a food waste program?	Percentage	Count
High involvement (led the program)	33%	2
Moderate involvement (helped facilitate the program and assisted with education efforts)	33%	2
Low involvement (assisted the program only when assigned)	17%	1
No involvement (aware of the program but the program did not intersect with my daily responsibilities)	17%	1

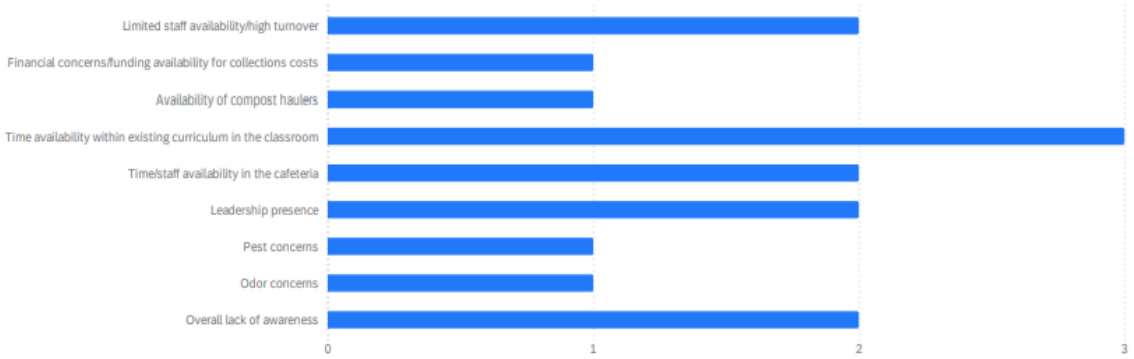
7b. What topics were discussed and implemented? Please select all that apply. 6



7b. What topics were discussed and implemented? Please select all that apply. 6

QID12 - 7b. What topics were discussed and implemented? Please select all that apply. - Selected Choice	Percentage	Count
Food waste overview	67%	4
Resources needed from farm to fork	33%	2
Food waste reduction strategies	100%	6
Donation options/laws	17%	1
Composting basics	83%	5
Food waste collections/waste sorting	67%	4

7c. What have been the greatest challenges your school/district has experienced with a school food waste education/collection program? Please select all that apply. 5



7c. What have been the greatest challenges your school/district has experienced with a school food waste education/collection program? Please select all that apply. 5

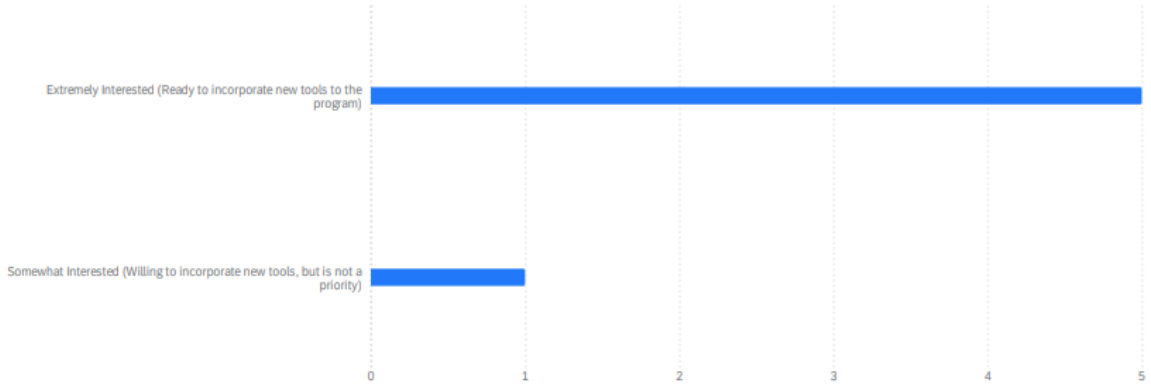
QID13 - 7c. What have been the greatest challenges your school/district has experienced with a school food waste education/collection program? Please select all that apply. - Selected Choice	Percentage	Count
Limited staff availability/high turnover	40%	2
Financial concerns/funding availability for collections costs	20%	1
Availability of compost haulers	20%	1
Time availability within existing curriculum in the classroom	60%	3
Time/staff availability in the cafeteria	40%	2
Leadership presence	40%	2
Pest concerns	20%	1
Odor concerns	20%	1
Overall lack of awareness	40%	2

7d. Please drag and rank the challenges selected by significance (1 equals most significant, highest number equals least significant). 4

7d. Please drag and rank the challenges selected by significance (1 equals most significant, highest number equals least significant). 4

7d. Please drag and rank the challenges selected by significance (1 equals...	1	2	3	4
Limited staff availability/high turnover	2	0	0	0
Odor concerns	0	1	0	0
Overall lack of awareness	1	0	0	0
Financial concerns/funding availability for collections costs	1	0	0	0
Availability of compost haulers	0	1	0	0
Time availability within existing curriculum in the classroom	0	0	3	0
Time/staff availability in the cafeteria	0	1	0	1
Leadership presence	0	1	0	1
Pest concerns	0	0	1	0

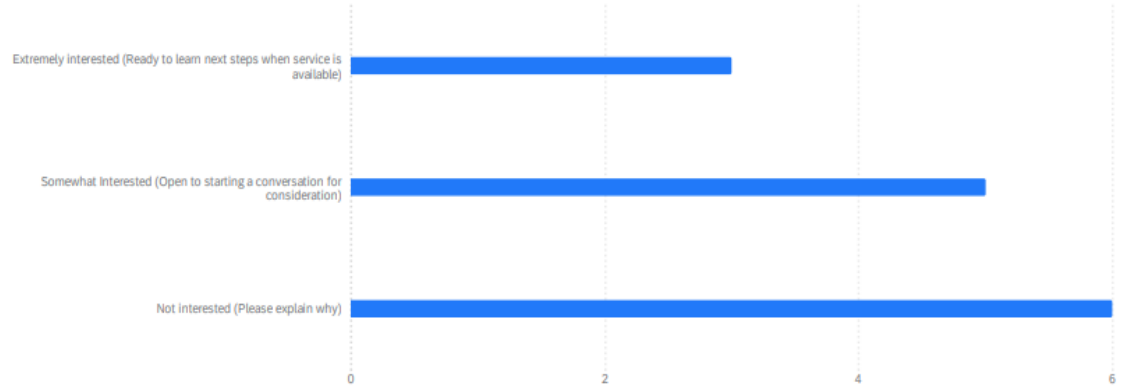
7e. How interested is your school/district in restarting or expanding a food waste education/collections program? 6



7e. How interested is your school/district in restarting or expanding a food waste education/collections program? 6

QID18 - 7e. How interested is your school/district in restarting or expanding a food waste education/collections program? - Selected Choice	Percentage	Count
Extremely Interested (Ready to incorporate new tools to the program)	83%	5
Somewhat Interested (Willing to incorporate new tools, but is not a priority)	17%	1

7.1 How interested is your school/district in implementing a food waste education/collections program? 14



7.1 How interested is your school/district in implementing a food waste education/collections program? 14

QID17 - 7.1 How interested is your school/district in implementing a food waste education/collections program? - Selected Choice	Percentage	Count
Extremely interested (Ready to learn next steps when service is available)	21%	3
Somewhat Interested (Open to starting a conversation for consideration)	36%	5
Not interested (Please explain why)	43%	6

7.1 How interested is your school/district in implementing a food waste education/collections program?: Not interested (Please explain why) 20

Not interested (Please explain why)

Not sure if they would

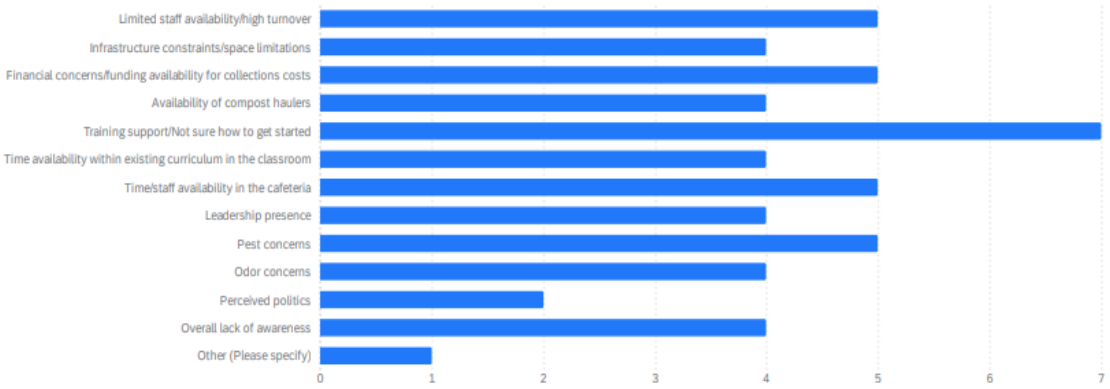
This decision is not mi e

I would like to start it at our school

New to this position still learning

I wish they can participate in an implementation of food waste

7.2 What obstacles have prevented your school from implementing a food waste program at your school/district? Please select all that apply. 8



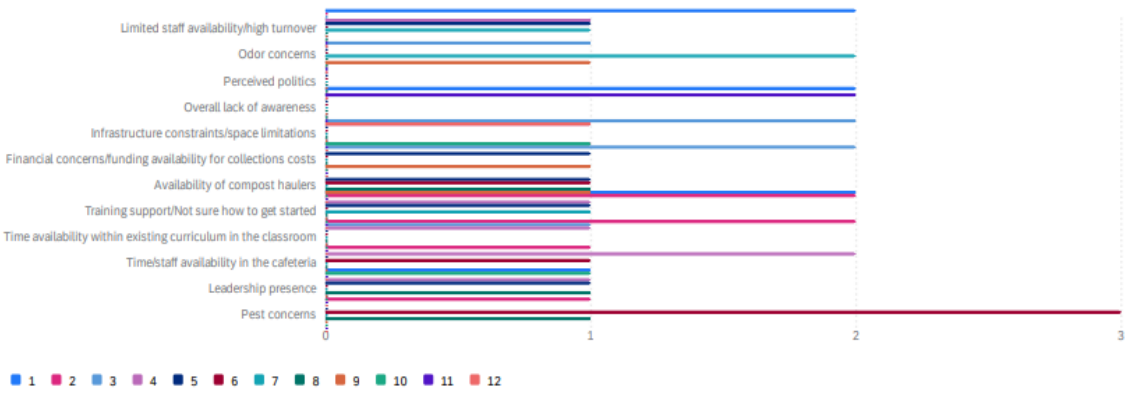
7.2 What obstacles have prevented your school from implementing a food waste program at your school/district? Please select all that apply. 8

QID14 - 7.2 What obstacles have prevented your school from implementing a food waste program at your school/district? Please select all that apply. - Selected Choice	Percentage	Count
Limited staff availability/high turnover	63%	5
Infrastructure constraints/space limitations	50%	4
Financial concerns/funding availability for collections costs	63%	5
Availability of compost haulers	50%	4
Training support/Not sure how to get started	88%	7
Time availability within existing curriculum in the classroom	50%	4
Time/staff availability in the cafeteria	63%	5
Leadership presence	50%	4
Pest concerns	63%	5
Odor concerns	50%	4
Perceived politics	25%	2
Overall lack of awareness	50%	4
Other (Please specify)	13%	1

Other (Please specify)

I don't know

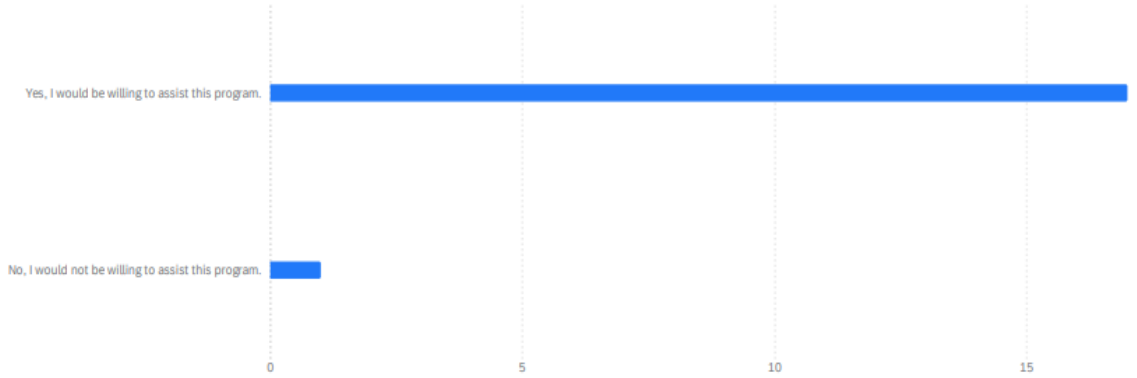
7.3 Please drag and rank the obstacles selected by significance (1 equals most significant, highest number equals least significant). 7



7.3 Please drag and rank the obstacles selected by significance (1 equals most significant, highest number equals least significant). 7

7.3 Please drag and rank the obstacles selected by significance (1 equals m...	1	2	3	4	5	6	7	8	9	10	11	12
Limited staff availability/high turnover	2	0	0	1	1	0	1	0	0	0	0	0
Odor concerns	0	0	1	0	0	0	2	0	1	0	0	0
Perceived politics	0	0	0	0	0	0	0	0	0	0	2	0
Overall lack of awareness	2	0	1	0	0	0	0	0	0	0	0	1
Infrastructure constraints/space limitations	0	0	2	1	0	0	0	0	0	1	0	0
Financial concerns/funding availability for collections costs	0	1	2	0	1	0	0	0	1	0	0	0
Availability of compost haulers	0	0	0	0	1	1	0	1	1	0	0	0
Training support/Not sure how to get started	2	2	0	1	1	0	1	0	0	0	0	0
Time availability within existing curriculum in the classroom	0	2	1	1	0	0	0	0	0	0	0	0
Time/staff availability in the cafeteria	0	1	0	2	0	1	0	0	0	1	0	0
Leadership presence	1	0	0	1	1	0	0	1	0	0	0	0
Pest concerns	0	1	0	0	0	3	0	1	0	0	0	0

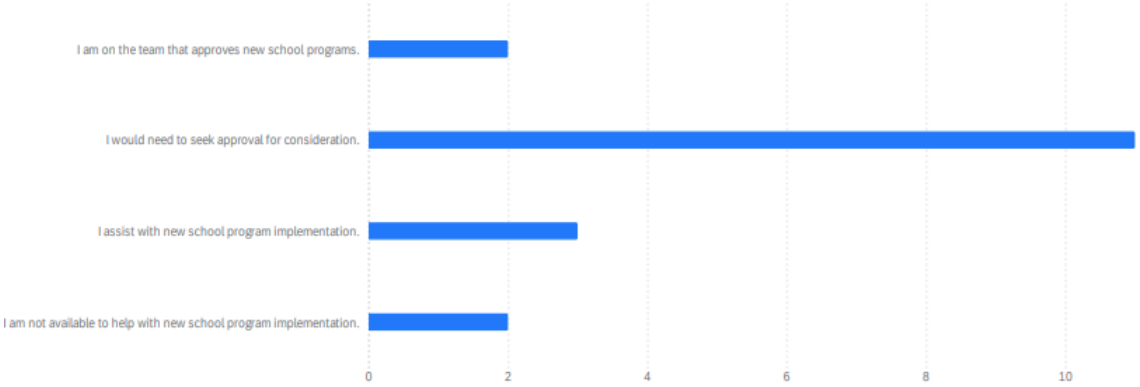
8. Would you personally be willing to support food waste education and collection programs efforts at your school/district? 18



8. Would you personally be willing to support food waste education and collection programs efforts at your school/district? 18

QID19 - 8. Would you personally be willing to support food waste education and collection programs efforts at your school/district?	Percentage	Count
Yes, I would be willing to assist this program.	94%	17
No, I would not be willing to assist this program.	6%	1

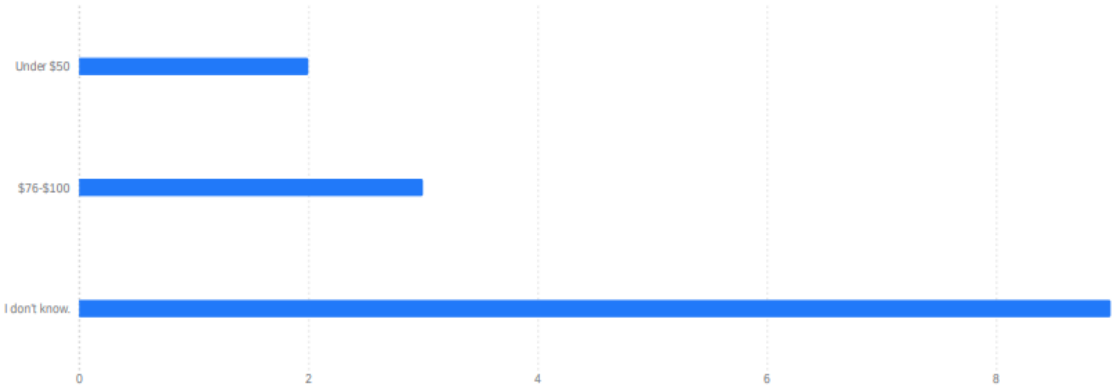
9. Please describe your decision-making power to implement a food waste program at your school/district. 18



9. Please describe your decision-making power to implement a food waste program at your school/district. 18

QID20 - 9. Please describe your decision-making power to implement a food waste program at your school/district.	Percentage	Count
I am on the team that approves new school programs.	11%	2
I would need to seek approval for consideration.	61%	11
I assist with new school program implementation.	17%	3
I am not available to help with new school program implementation.	11%	2

9a. How much would your school be willing to PAY PER MONTH for weekly food waste collections to be composted at a commercial facility? 14

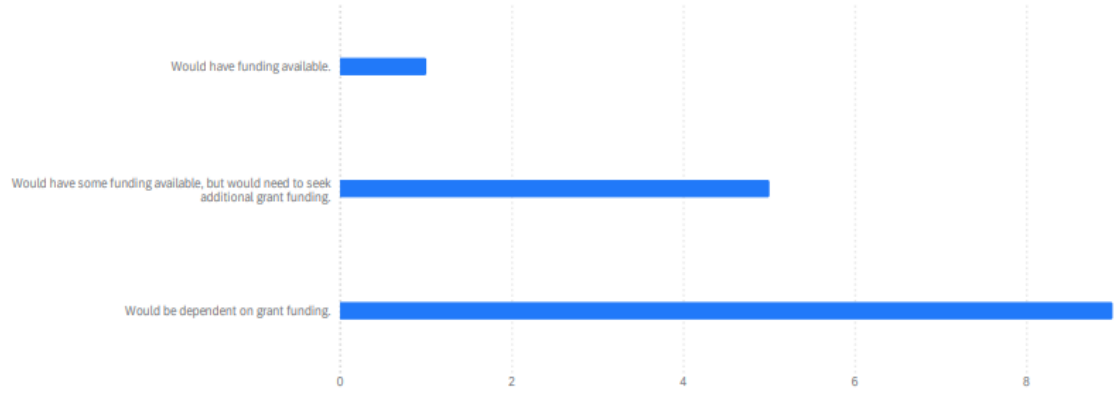


9a. How much would your school be willing to PAY PER MONTH for weekly food waste collections to be composted at a commercial facility? 14

QID21 - 9a. How much would your school be willing to PAY PER MONTH for weekly food waste collections to be composted at a commercial facility?	Percentage	Count
Under $50	14%	2
$76-$100	21%	3
I don't know.	64%	9

9b. If you could estimate, how much would your school be willing to PAY PER MONTH for weekly food waste collections to be composted at a commercial facility? 1

10. In order to financially support a food waste education/collections program at my school/district we... 15



10. In order to financially support a food waste education/collections program at my school/district we... 15

QID26 - 10. In order to financially support a food waste education/collections program at my school/district we...	Percentage	Count
Would have funding available.	7%	1
Would have some funding available, but would need to seek additional grant funding.	33%	5
Would be dependent on grant funding.	60%	9