Rethinking Recycling:

Reducing Bin Contamination in the UWT Science Building

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Abstract

Research is needed to understand recycling behaviors to potentially increase the rate of recyclable materials and decrease the rate of contamination. Recycling plays an important role in the worlds sustainable future (Smyth, 2010). In this study, we sought to understand the barriers that keep individuals in the science building on the University of Washington Tacoma campus from recycling efficiently. Survey and monitoring strategies were used to gain information about what can be done to increase recycling, using the science building as a case study for the greater campus. From this, increased signage, bin connection, and fixed places for bins are three major pieces that were implemented. After implementation monitoring will continue, pre and post data will be compared and results will be discussed.

Significance

This project helps move UWT toward becoming a more sustainable University. It identifies that with standardization of trash and recycling bins and a small amount of education provided from our recycling signs (see below), we can make a positive change in UWT's students, faculty, and staff's recycling habits. This behavior change leads to more recycling and less contamination in the recycling bins.

Our bins and signs

Figure 1: The sign that we posted in order to indicate to students what can and cannot be recycled

Figure 2: The trash bin and recycling bin after they had been connected together.

References

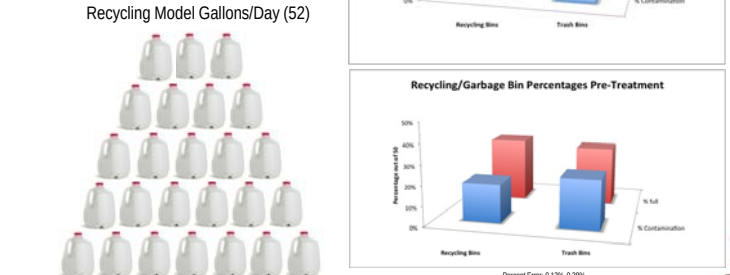
Smyth D et al. Reducing solid waste in higher education: The first step towards 'greening' a university campus. Resources, Conservation and Recycling. (54) 1007-1016.

How we can benefit UWT

Through implementation of our project, we plan to benefit the University of Washington, Tacoma by saving money, increasing recycling and reducing green house gases on campus.

It cost the University $1,438 to dump its trash compactor each week, while recycling costs a mere $60. Therefore, maximizing the amount of recycled materials and decreasing contamination becomes essential. With proper signage, education and standardization of bins we can decrease overall waste cost for the university.

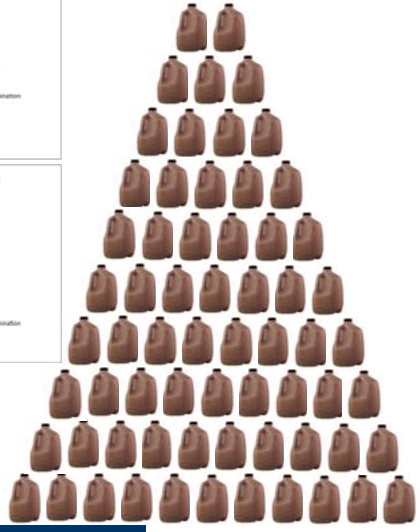
Graphs and Image



Percent Error: 0.13%-0.38%

Recycling Model Gallons/Day (52)

Garbage Model Gallons/Day (66)



What we found

Pre-Treatment	Amount/week (Gal)	Amount of contamination/week (Gal)	Total cost/week ($)	Cost of contamination/week ($)
Recycling	403.20	76.44	$7	$1.32
Garbage	441.00	105.84	$143	$34

Post-Treatment	Amount/week (Gal)	Amount of contamination/week (Gal)	Total cost/week ($)	Cost of contamination/week ($)
Recycling	328.44	13.44	$5.67	$0.23
Garbage	483.00	10.08	$160.07	$3.34

Table 1: Biweekly data of total garbage and recycling amounts for the science building both pre and post treatment. In addition what these amount cost the university and students.

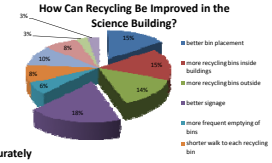
During data collection we found that the average total garbage per week increased from pre to post treatment. The average amount of recycled materials for that week decreased from pre to post treatment. However, the amount of contamination decreased from pre to post treatment (Tbl 1).

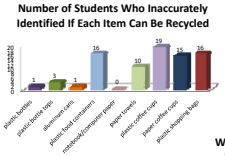
- The total cost to remove garbage waste from the compactor is $1,438/week.
- The total cost to remove recycling from the compactor is $60/week.
- Recycling/Garbage is not sorted individually per can. If ANY trash is found in a recycling bin it is all considered garbage.

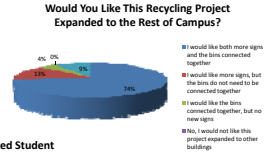
The amount of garbage the Science Building produces will vary from week to week. Therefore, the single most important factor is contamination. Decreasing contamination keeps whole recycling bins (23gal) from being thrown into the garbage because of one singular trash article. Thus, more recycling is allowed to go into its proper container decreasing the amount of garbage created. If this is done, the overall cost of weekly garbage will dramatically decrease, while increasing the amount of proper recycled materials. Saving the students and university money. Money that does not have to be spent, by simply disposing of materials in the correct way.

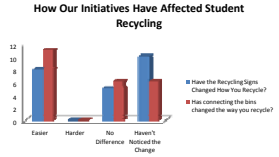
Pie chart of survey pre and post

Survey 1:
Before making the Changes,
35 surveys were distributed









Survey 2:
After making the Changes,
23 surveys were distributed

Survey information

We conducted two surveys in order to assess student opinion on recycling in the Science Building. Our survey was a sample size of about approximately 5% of the Science building population. Below are our findings.

Survey 1: Before the Sign and Bin Changes, Top 2 Responses

How can recycling be best improved on campus	Better Signage– 18%	Bin Placement– 15%
How much do you recycle	All of the time – 47%	Much of the time – 47%
If a recycling bin is not next to a trash bin, which are you most likely to do	Hold onto everything until a bin is found – 50%	Look for a bin and walk to it if I see one– 44%
Top two items inaccurately recycled	Plastic Coffee Cups– 53%	Plastic Containers– 45%

Survey 2: After the Sign and Bin Changes, Top 2 Responses

Have the signs affected the way you recycle	Haven't Noticed – 44%	Recycling is Easier – 35%
How can the signs be improved	Haven't Noticed – 39%	Bigger Signs – 30%
Has connecting the bins together affected the way you recycle	Recycling is Easier – 48%	No Difference – 26%
Should the project be expanded to all of campus	Both Signs & Bins – 74%	Only the Signs – 13%

The Future of our project

As the photographs show, the recycling system around campus is confusing and has high levels of variance depending upon the building. Below are three ways to expand the project.

- Encourage student involvement through educational events to address barriers to recycling and disseminate recycling information
- Document the different kinds of recycling bins on campus and collection information on which bins work best to encourage student recycling
- Implement a more comprehensive pilot program to target the best ways to improve campus recycling

Closing Message

When considering how to improve recycling and decrease waste **education**, **proper visuals** and **simplicity** is key. Recycling can be improved in a number of different scenarios and we hope that are model can be applied to a variety of situations.