

UBC Social Ecological Economic Development Studies (SEEDS) Sustainability Program

Student Research Report

Plants Promoting Happiness: Personification of Plants Increases Care for Plants

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Executive Summary

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This study examines the following question: could the personification of plants—relaying human characteristics to a non-human plant—increase pro-environmental behaviour? Through personifying plants, we believe that participants in our experiment can better relate to plants, therefore increasing their pro-environmental behaviours. Such findings will be important to the field since it could be used to personify greater aspects of nature (such as parks and forests) to elicit more pro-environmental behaviour.

Our experiment was conducted at the CIRS building at the University of British Columbia. Data was observed of students and staff passing through the building during our observation period. Three conditions were observed in our experiment: 1) a personified plant, 2) a plant with scientific information, and 3) a plant with instructions for care. Measurement of pro-environmental behaviour is collected through the use of fertilizer distribution for each plant. Increased amounts of fertilizer represents more pro-environmental interaction between the plants and participants. Our finding suggests that personified plants received the most pro-environmental interaction, followed by plants with scientific information, and lastly plants with care instructions only.

Introduction

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Current knowledge surrounding personification as a potentially impacting factor in participant engagement has been limited to a few studies. Personification of inanimate objects, ideas, or concepts have been positively displayed in studies for promoting certain government organizations and in advertising (Shahar, 2017; Delbaere, 2011). These studies compared personified concepts to either malevolent or neutral ones. Both studies showed that the application of personification was associated with greater support for and participation in ideas and activities that the researchers wanted their audiences to be involved with. Based on these results, we came to suspect that personification draws support and participation.

Furthermore, Silva & Figueiredo (2017) explains how sustainability stems from the beliefs and goals that social and economic actors share, suggesting that sustainability can be observed and practiced through socially constructed actions and intentions. From this, we began to question if personification could be used to elicit socially constructed actions and intentions of pro-environmental behaviours. One of the motivations behind our current project is to address the gap in the literature on the relationship between personification and sustainability. Presently no relationships have been made in existing literature that suggests personification could aid in sustainability practices.

Research Question and Hypothesis

2

In this paper, we address the question: could personifying plants increase pro-environmental behaviours in UBC students, faculty and staff?

We hypothesize that the personification of plants in the CIRS building would increase pro-environmental behaviours. In contrast, our null hypothesis suggests that the personification of plants in the CIRS building does not increase pro-environmental behaviours.

Methods

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Participants.

The study observed a sample population of UBC students and faculty at the Centre for Interactive Research on Sustainability (CIRS) at the University of British Columbia (UBC) during nine weekdays between March 19th, 2018 to March 29th, 2018, between 8:00 AM to 6:00 PM. Since the data collection and participant analysis was observational, there was no need for an ethics consent form or a debrief.

Conditions.

We hypothesize that personification of plants increases pro-environmental behaviours. In order to test our hypothesis, we designed an experimental field study of three-leveled independent variables: a personified plant, an informational plant, and an instructional plant.

- **Experimental Group A | Personified Plants:** Potted plants personified with names and personalities, measuring the role of relational connection with plants.
- **Experiment Group B | Informational Plants:** Potted plants with informational description and knowledge of the plant (*Bellis perennis*, located in the Boreal Forest... etc.), measuring the role of knowledge of plants.
- **Control Group | Instructional Plants:** Potted plants with only instructions for plant care, measuring the role of instruction.

Please refer to the Appendix A for more details on our conditions.

We designed Experimental Group B and the Control Group to examine if the role of knowledge of plants and the role of instruction had any influence on our dependent variable: pro-environmental behaviour—as measured in care for plants by participants.

Measures.

Pro-environmental behaviour refers to any behaviour that benefits and helps any aspect of the environment, including natural habitat, conservation movements, animals, and the plants themselves. Therefore, a level of pro-environmental behaviour can be observed in the amount of care given to plants. In this study, we observed care for plants by participants specifically by the amount of fertilizer they would give the plants (since fertilizing plants is a form of care for plants). Even when one participant chooses to fertilize the plant more than the set amount of the small cup, the action is still measurable to his/her pro-environmental behaviour. Therefore, our dependent variable is the amount of fertilizer given to each potted plant.

As for the collection of an accurate measurement of fertilizer given to the plants from our sample population (without the confounding effect of the fertilizer being absorbed by the plants), we created a system that separated the fertilizer provided by participants from the soil of the plant. The fertilizer was provided on site in a pitcher, which was placed together with a little cup that participants could use to transfer a set amount of fertilizer for the plants into the pots.

Procedure.

At the beginning of the study, each potted plant was set up to be located throughout the first floor of the CIRS building, with enough distance (at least 10 feet) between each plant to prevent carryover effects from one condition to another. Each pot came with a pitcher of fertilizer, a small cup for transferring fertilizer onto pots, and placards of the different conditions (*Appendix A*).

After the study was set up, the field site was left alone for the day. It was during this time that our sample population would enter and exit the CIRS building and fertilize the plants as they chose. If our alternate hypothesis were true, the participants would care for personified plants more than all other plants present. This is because we expected participants to feel more connected to the personified plant and would feel inclined to care for it more than those plants that were not personified.

At the end of each day at the same hour, we would collect data and reset the site for the next day. At that time, experimenters collected the fertilizer from each plant and sealed it in a ziploc bag labelled with the date and the condition it was collected from. This ziploc bag was then measured by one experimenter on the last day of the study for consistency. In addition, the site was cleaned, the plants were watered after fertilizer has been collected, and all materials were made sure to be present, including the plant, a pitcher of fertilizer, a small cup, and the appropriate greeting card for each condition. Because we collected our data and reset the site on the last hour that the CIRS building would close, everything was set up to be conducted by the next day.

Results

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Because we were unable to monitor the number of our sample we population who participated in our study, we were not able to conduct a one-way ANOVA test with the data we collected. However, our findings in *Appendix B* show the quantitative total of our measured variable: the amount of fertilizer collected, measured in grams. When the data is date dispersed, as shown in *Figure B3*, there are several days where the informational condition surpasses the personification condition in terms of measurements. It is also important to note that the raw data results in *Figure B1* show a high standard of deviation in the personification condition, meaning that there is a lot of variability in our sample. With all these factors considered, our first graph, *Figure B2*, depicts the total compiled results of our data, in which the personification condition (personified plants) shows the greatest amount of fertilizer collected, followed by the informational condition, and finally the instructional condition. When the error bars are placed for our personification condition and informational condition, the variabilities overlap. This means that there is a potential for the population values for the two to be the same.

Discussion

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Our results suggest that there is in fact an effect seen when personifying plants that lead to an increase in potential pro-environmental behaviour. However, there were a number of limitations and potential confounding variables that may have had an effect on our experiment and results.

For example, the placement of the plants in the CIRS building may have affected the amount of fertilizer each plant received simply from the amount of exposure and foot traffic the plant's location would usually receive. The frequency and sizes of classes held in the CIRS building on any given day would also have an effect on the amount of traffic in the plant area, which could explain the high variability in the data collected over the two weeks. We tried our best to place the conditions in equally high-traffic locations, but there was nonetheless some variability between the three locations we chose. Specifically, the informational plant condition was placed by the entrance of a lecture hall, where hundreds of students walk by every day. The instructional plant condition was placed at the Loop Cafe in the CIRS building, where people would wait around the plant for their orders, increasing the amount of attention the plant could receive.

Another potential confounding variable is that our personified plant "Posie" received a bow which could be more eye-catching than the other 2 plants that were left bare. We also ran into trouble with the building staff at CIRS. During data collection one day, we directly saw the cleaning staff watering our plants, which began dissolving the fertilizer we had collected. Only after approaching them and explaining that we were leaving the plants as a part of an experiment did they agree to leave the plants alone. Although this can be interpreted as a form of pro-environmental behaviour, it skewed our data collection.

It is also important to note that this experiment was conducted at a location that is densely populated by WEIRD (Western, Educated, Industrialized, Rich, and Democratic) participants. The sample size itself was also limited to only those who enter the CIRS throughout the week. In addition, the CIRS is an environmentally-focused building. Staff members may have already adopted pro-environmental behaviours. On a larger scale, the UBC community is also increasingly focused on sustainability and pro-environmental behaviour all around campus, and this influence could have had an effect on the students and their actions that might not be transferable to the greater population of people that are not students or faculty at UBC.

Another confounding factor was that the fertilizer pitcher for the personified condition was stolen on the third day of our experiment (March 21, 2018), which may have prevented individuals from providing care for the condition. In addition, on the fourth day of our experiment (March 22, 2018), the information condition plant was moved from the left side of the lecture hall entrance to the middle, which may have resulted in more participants interacting with the plant.

The implications of our experiment are relevant to environmental sustainability in university students by exemplifying how the simple act of personifying plants can stimulate pro-environmental behaviours. This is significant not only because of the effects that these behaviours can have on plants, but also the implications these behaviours can have on all aspects of interaction with nature. It is incredibly important for society to create a culture of sustainability in order for the next generation to prosper, and by applying the results of our experiment to the greater population, we can not only become more pro-environmental, but we can also help encourage social movements and even incorporate personified plants into early childhood education to foster early pro-environmental attitudes towards plants.

Recommendation for UBC Clients

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Our results can contribute to making students feel more connected to the ecosystems around us. Depending on the application of our results, it can both make students more environmentally aware, and also remind students to recycle more. For example, we would recommend pairing the use of personified plants on garbage bins with the currently ongoing “Sort It Out” sustainability initiative (*Appendix C, Figure C1*), reminding students to be more sustainable and less wasteful. We would also recommend extending this idea of personifying plants to the gardens around campus such as the Nitobe, Rose, and Botanical gardens to further encourage pro-environmental behaviours and attitudes (*Figure C2*).

APPENDIX A

Experimental Conditions

In order to test our hypothesis (the personification of plants increases pro-environmental behaviours), we designed an experimental field study of three conditions: personified plant, informational plant, and instructional plant. Each figure includes an image of the overall placement of the plants and a close-up of the placard. *Figure A1* depicts the personified plant condition, *Figure A2* depicts the informational plant condition, and *Figure A3* depicts the instructional plant condition.

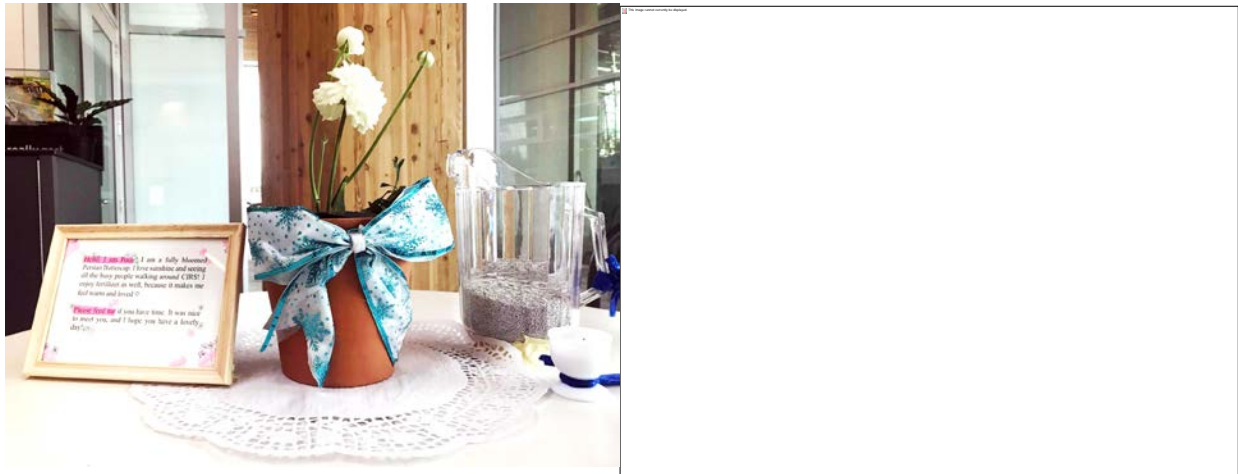


Figure A1. Personified Condition: the plant was named (Posie), had a bow decoration, and the placard was voiced in first person and expressed the flower’s preferences. Unlike the other two conditions, the personified plant asked the participants to “please feed me” rather than “please fertilize this plant”. This condition was located at the lounge of the CIRS building.

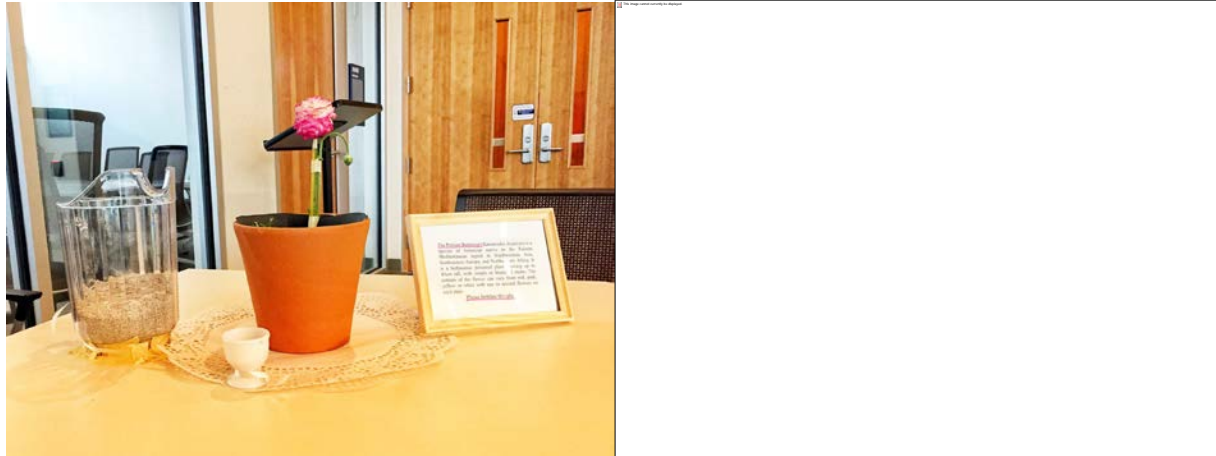


Figure A2. Informational Condition: a description of the plant included its scientific name, and growing conditions were described to participants. This condition was located outside of the lecture hall entrance of the CIRS building.

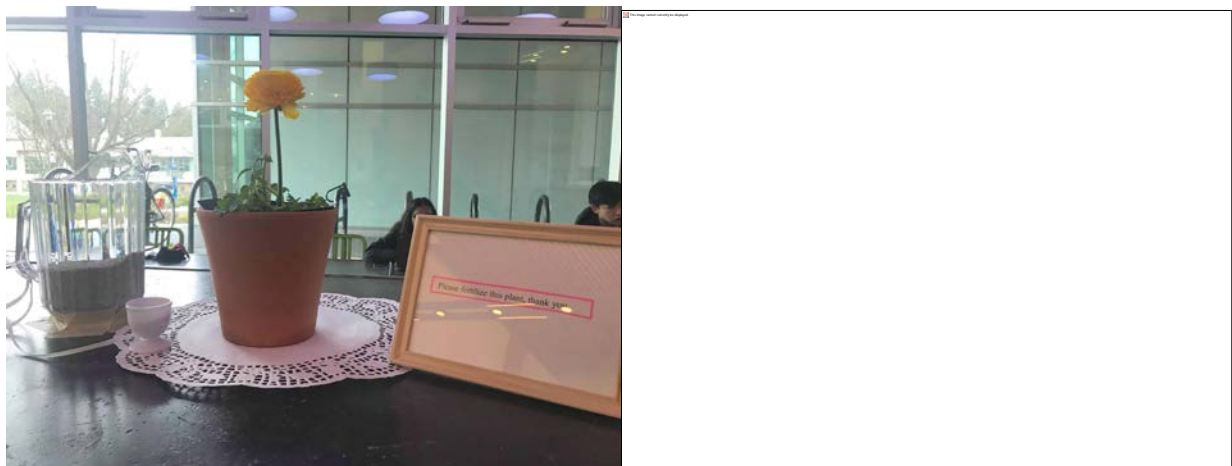


Figure A3. Instructional Condition: only instructions for plant care were included in the placard. This condition was located on the table outside the Loop Cafe in the CIRS building.

APPENDIX B
Collected Data

The results shown in the graph align with our hypothesis and expected data. Through this proof, we can successfully reject the null hypothesis. The three conditions shown (personified, informational, instructional) are shown as x and the amount of fertilizer (care) is shown as y. *Figure B2* is a bar graph that depicts the total compiled results of the data, *Figure B3* is a line graph that depicts the data dispersed into specified dates, and *Figure B1* is a chart with our data collection from March 19–29, 2018.

CONDITION	Mar 19	Mar 20	Mar 21	Mar 22	Mar 26	Mar 27	Mar 28	Mar 29	TOTAL	Std Dev
Personif.	28	85	0	176	64	14	0	10	377	60.49
Info.	3	18	53	17	172	7	6	1	277	57.95
Inst.	0	13	0	1	2	0	42	4	62	14.51

Figure B1 is a chart with our data collection from March 19–29, 2018.

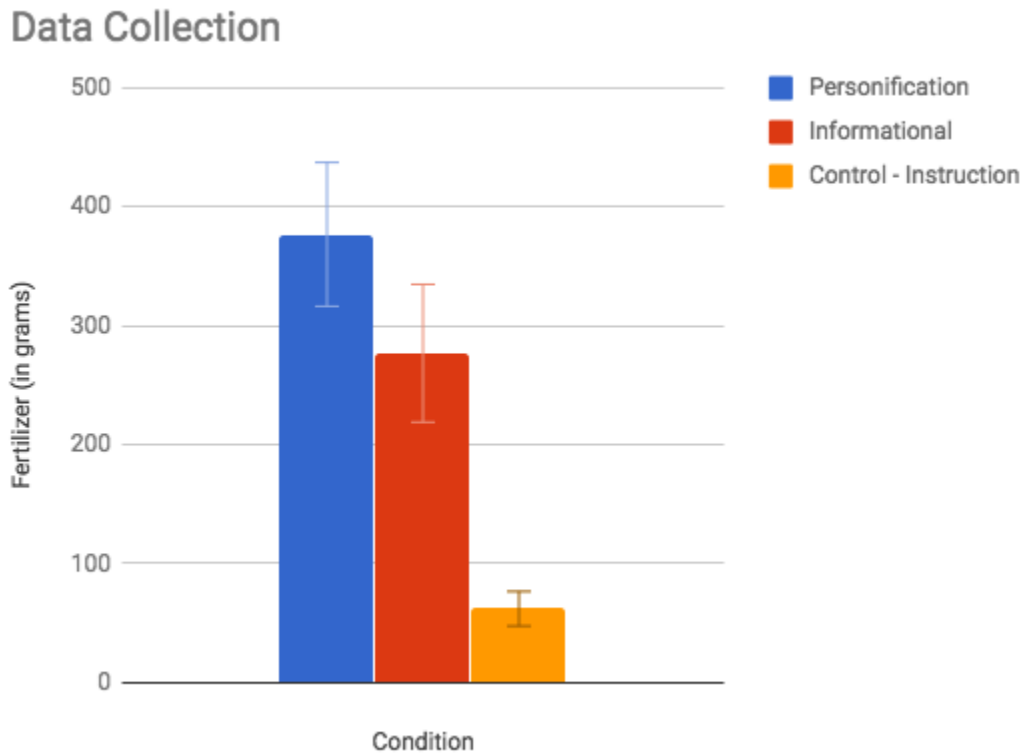


Figure B2 is a bar graph that depicts the total compiled results of the data. The personification condition shows the greatest amount of fertilizer collected, followed by the informational condition, and finally the instructional condition.

Data Collection: Date Dispersed

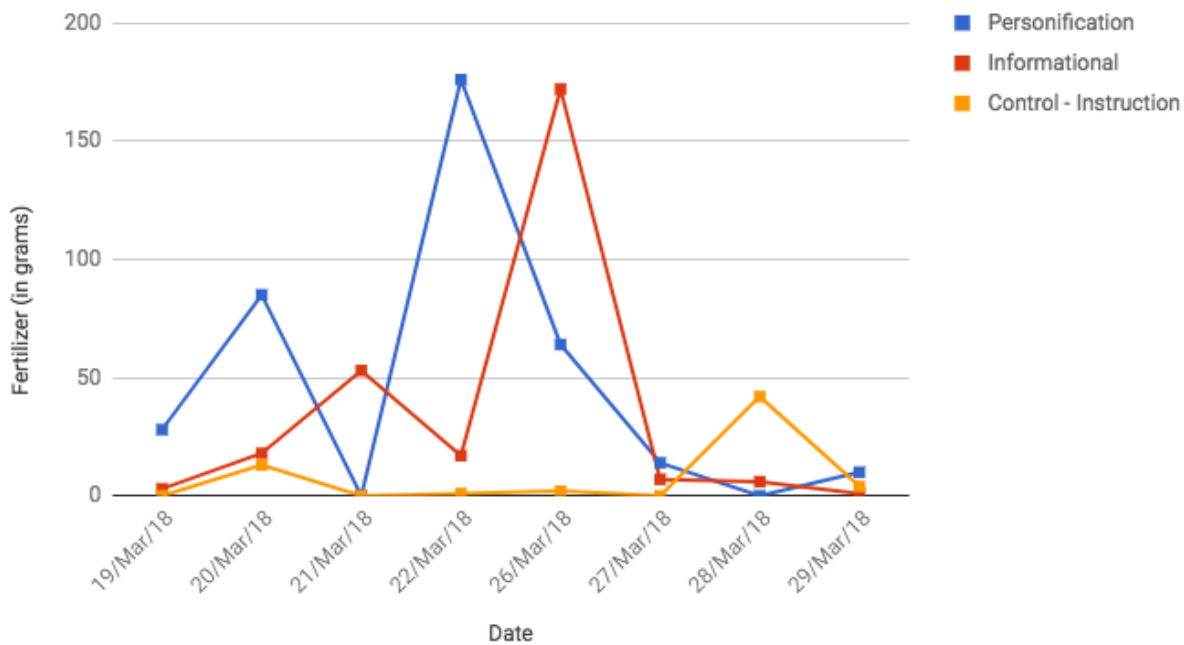


Figure B3 is a line graph that depicts the data dispersed into dates. There are several dates where the informational condition passes the personification condition in terms of measurements.

APPENDIX C

Recommended Information

Figure C1 is an example of personification in the UBC “Sort It Out” sustainability initiative on campus. *Figure C2* is a personified tree located on the intersection of Kingsway and Main Street, outside the Vancouver Public Library.

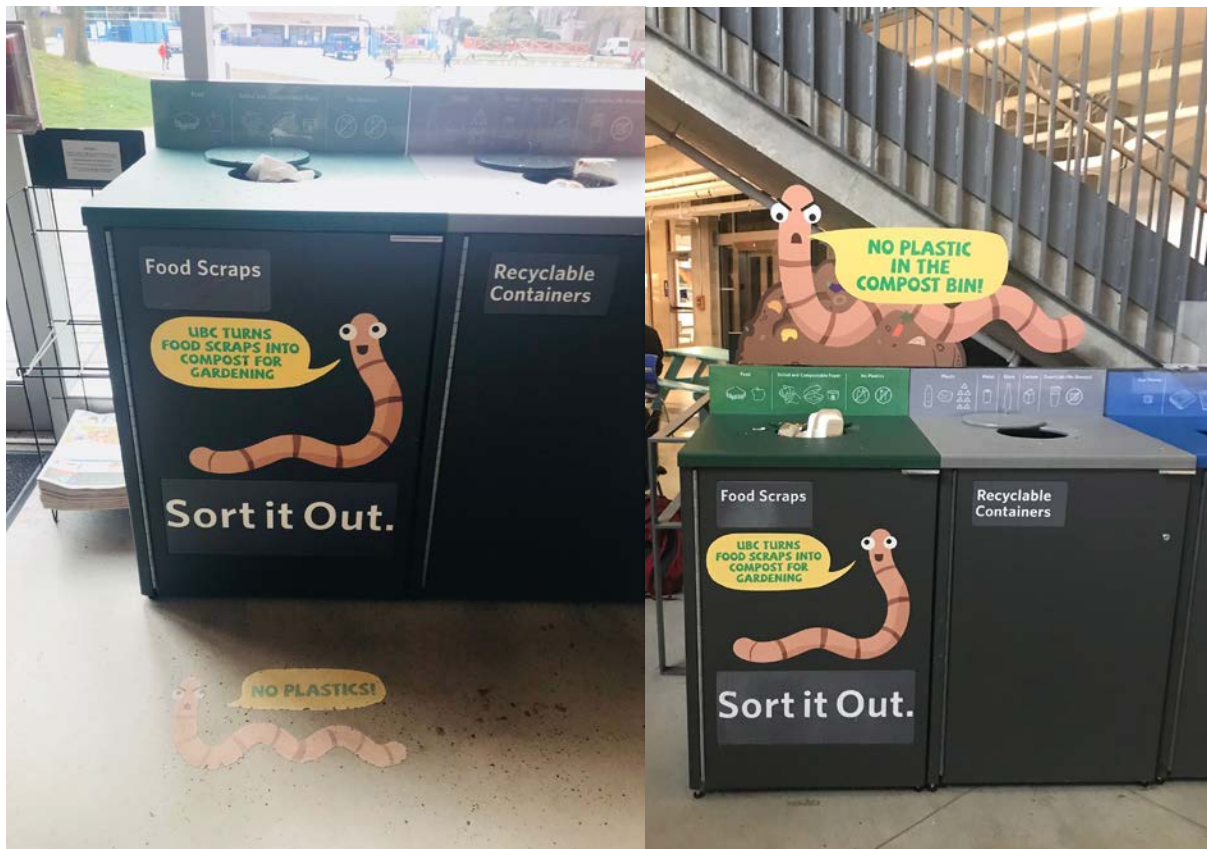


Figure C1. An example of personification in sustainability initiatives on campus. The UBC “Sort It Out” program employs two personified earthworm “mascots”, Thelma and Thomas. The mascots urge students to avoid placing plastic items into the compost section of the waste bins in the CIRS building and the AMS Student Nest.



Figure C2. Personified tree located on the intersection of Kingsway and Main Street, outside the Vancouver Public Library.

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