Research Reports

The Relationship between a Campus Composting Program and Environmental Attitudes, Environmental Locus of Control, Compost Knowledge, and Compost Attitudes of College Students

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ADDITIONAL INDEX WORDS. recycling, sustainability, landfills, waste management, environmentalism, waste diversion

SUMMARY. Food waste is one of the most abundant materials contributing to landfills in the United States. The U.S. Environmental Protection Agency estimates 96% of uneaten food ends up in landfills. Food and other organic wastes generate potent greenhouse gases in the atmosphere precipitating global climate change. College campus cafeterias generate a large amount of food waste and some universities are making efforts to capture and compost food waste. The purpose of this study was to measure the relationship between participation in a university composting program and students' environmental attitudes, environmental locus of control (refers to the belief that an individual's actions play a direct role in the result of any affair), compost knowledge, and compost attitudes. Undergraduate and graduate students were given a survey, which included an environmental attitude scale, an environmental locus of control inventory and sections where students reported their composting habits, knowledge of the composting process, and how composting made them feel. A total of 660 surveys were collected from two universities, one that acted as the treatment and the other as the control group. The results indicated a statistically significant difference between the school with a composting program and the school without a composting program on the variables of environmental attitudes, environmental locus of control, and composting knowledge. Furthermore, composting attitudes were positively related to environmental attitudes, environmental locus of control, and compost knowledge at the university with a composting program. Demographic comparisons found differences within the treatment group on the composting attitude and knowledge and environmental attitude inventories but not locus of control.

The United States currently generates 390 million tons of trash per year, or 7 lb per person per

day (Kasper, 2013; van Harren et al., 2010). The quantity of waste generated has far-reaching environmental impacts.

According to the Food and Agriculture Organization of the United Nations (FAO), $\approx 30\%$ of food is wasted, which amounts to nearly 1.3 billion tons per year (FAO, 2011). The U.S. Environmental Protection Agency (EPA, 2009) estimates 96% of uneaten food (21.5 million lb annually) ends up in landfills each year. This waste accounts for an additional 3.3 billion tons of greenhouse gases released into the earth's atmosphere annually (FAO, 2013).

Raising individual awareness of the immediate and long-term effects of food waste disposal in landfills on the environment is important, particularly in large organizations. Instead of conventionally disposing of food wastes by sending it to a landfill, composting is a more sustainable alternative that is gaining popularity. Through a decomposition process, composting takes organic waste and turns the matter into a "topsoil-like" material called compost, which has environmental and economic value.

With increased enrollment, college campuses experience increases in food waste generated. These self-contained campus environments, which model other large organizations, offer opportunities to influence change by collecting pre- and postconsumer food wastes from students participating in the recycling/composting sorting process in the cafeterias (Sanders et al., 2011).

In some areas of the United States, separating green waste from trash and recyclables has become law. In some areas, bans have been placed on businesses and institutions improperly disposing of one or more tons of commercial organic waste a week (Commonwealth of Massachusetts, 2015), whereas other areas have made sorting organic waste from garbage mandatory for either organizations or homeowners (City of New York, 2015; Green Cities California, 2014; Seattle Public Utilities, 2014).

Creating an atmosphere where students are able to actively engage in the maintenance of their campus community and environment is one way to begin educating and introducing the concept of separating food waste and

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doi: 10.21273/HORTTECH03320-16

Units

To convert U.S. to SI,
multiply by

U.S. unit

SI unit

To convert SI to U.S.,
multiply by

0.4536

lb

kg

2.2046

1.6093

mile(s)

km

0.6214

0.9072

ton(s)

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1.1023

its environmental impacts on university and college campuses. Ohio University (Athens) is currently home to the largest in-vessel composting system on any college or university campus in the nation collecting food scraps 6 d per week from the Central Food Facility and campus dining halls (Ohio University, 2015). Before 2009, on-campus dining halls at Texas State University (San Marcos), discarded on average 300 thousand pounds of food waste per year (McKenzie, 2013). In 2011, 3 years after the Bobcat Blend composting program at Texas State University had been implemented nearly 57 tons of food waste had been diverted from landfills and made into compost. In 2012, with a crew made up of seven student employees, Bobcat Blend processed nearly 80.4 tons of food waste from dining halls across the university campus (McKenzie, 2013).

Ohio University and Texas State University are not the only campuses to integrate green waste programs. College campuses and universities across the nation are beginning to experiment with the benefits of such an interdisciplinary education concept regarding food waste, energy conservation, and their environmental impacts (Lilly, 2010). To support these efforts, many college campuses are integrating composting programs to collect food waste and are also using the programs to educate students about environmental stewardship (University of Texas at Arlington, 2015).

Actively engaging and educating college students regarding the importance of composting and the positive effects their actions play on the immediate and distant future of the environment is vital to the success of a continued sustainable future. Irresponsible environmental behavior at the individual level is a cause or exacerbating factor for many environmental problems and issues (Bradley et al., 1999). People develop environmental attitudes at a fairly young age, but those attitudes are thought to continue to be malleable (Bryant and Hungerford, 1977). For example, children as young as junior high exposed to environmental courses improve environmental responsibility and awareness (Bradley et al., 1999; Jaus, 1982; Jordan et al., 1986; Ramsey, 1989; Ramsey and Rickson, 1976). According to Newhouse (1991), life experiences (such as engaging in the actual process of

recycling and composting) are most likely to play a direct role in forming a person's environmental attitude; in turn, individuals are able to witness firsthand the immediate and long-term benefits of their work (Cammack et al., 2002).

Previous research indicates educating high school-aged youth about the environment can have positive effects. Positive, statistically significant correlations were found between environmental knowledge and environmental attitudes of high school students (Bradley et al., 1999). "Environmental knowledge improves environmental attitudes, and positive attitudes toward the environment result in environmentally responsible behavior" (Cammack et al., 2002). When people understand the positive implications of their actions and are able to see results and a tangible product of their labor, future actions are more likely to be positively affected and influence the continuation of positive environmental habits (Arcury, 1990; Hungerford and Volk, 1990; Newhouse, 1991; Ramsey and Rickson, 1976).

Locus of control refers to the belief that an individual's actions play a direct role in the result of any affair (Aguilar et al., 2008). An internal locus of control indicates the individual believes their actions influence the outcome, whereas an external locus of control indicates the individual believes their actions have little to no influence on outcomes. This is an important consideration in developing proenvironmental behaviors, as individuals who believe their actions do not influence the outcome are less likely to modify their actions (Aguilar et al., 2008). It is also important to note the environmental locus of control of young people "are particularly important because young people ultimately will be affected by and will need to provide solutions to environmental problems arising from present-day actions" (Bradley et al., 1999). However, research studying the environmental attitudes and environmental locus of control of college students, some of the young adults next to make decisions regarding their environmental behaviors, is very limited.

The purpose of this study was to measure the relationship between participating in a college composting program and students' environmental

attitudes, environmental locus of control, compost knowledge, and attitudes toward composting.

Materials and methods

STUDY SITES. Two public state universities were chosen for the study, one of which had an active composting program (Texas State University, San Marcos) and was used as the treatment group and the other lacked a composting program (Farmingdale State College State University of New York, Farmingdale) was used as the control group.

SAMPLE. Students volunteered to participate in the survey and were recruited in various classes where instructors allowed the survey to be administered. Courses included those from across campus, colleges, and levels. Students were offered incentives such as horticulture T-shirts or ink pens, or to be entered into a drawing for a gift card to encourage participation. Because the study sites and sample were those that were available to researchers and not randomly assigned, results are exploratory and not generalizable beyond the populations of these specific schools.

TREATMENT. At Texas State University, the Bobcat Blend Composting project began in 2008. When the project was initiated, cafeteria waste from two dining halls and invasive plant species from the San Marcos River, which runs through campus, were the original feedstocks used in compost piles. However, the project has expanded to include collections from five of six cafeterias. In addition, the project collects leaves and tree trimmings from the Grounds and Agriculture Department, coffee grounds from the Honors Department, food waste from the Child Development Center and the Nutrition Laboratories, and grass clippings from the sports fields and golf course.

Since the program collects pre- and postconsumer organic waste from cafeterias, students are actively involved in sorting the postconsumer food waste in to the proper bins. Signage directs students and helps them make decisions. In addition, students employed with the Bobcat Blend program will occasionally educate students in public areas on the composting program, the proper sorting techniques, and typical contaminants, compost, and the value of compost.

Between Aug. 2013 and May 2014, six to eight students collected and processed ≈ 140.5 tons of food waste to produce Bobcat Blend compost (an increase from 80.7 tons in 2012–13, 57 tons in 2011–12, and 27 tons in 2010–11). The compostable materials are taken to the compost site, 10 miles from campus, and processed in traditional windrow piles. Compost is used back on campus in the greenhouses and gardens and sold to the community.

SURVEY ADMINISTRATION. Surveys were administered in classes, cafeterias, and in publicly accessible locations on campus where students were approached to participate. All surveys were administered by researchers involved in the study of consistency in administration. The survey generally took ≈ 10 –15 min to complete.

INSTRUMENTATION. The survey was modeled on previously used instruments known to be reliable and valid (Aguilar et al., 2008; Logsdon and Sayles, 2011). The survey contained each of the five sections (environmental attitude survey, environmental locus of control, compost knowledge, compost attitudes, and demographics) outlined in detail with scoring and coding information below. Negatively worded statements such as, “it’s ok to pollute as long as you are on your own land,” were reverse coded during data analysis.

ENVIRONMENTAL ATTITUDE INSTRUMENT AND SCORING. The environmental attitude section of the survey included 20 questions. Examples of survey questions included “it’s ok to pollute as long as you are on your own land,” “all plants and animals are important,” and “I feel good when I am close to nature.” Students responded to statements using a Likert-type scale ranging from “strongly agree” to “strongly disagree” (Likert, 1967) with the most negative response scoring the fewest points (1) and the most positive response scoring the most points (5) for a total score of 100 possible points. Higher scores indicated more positive environmental attitudes while lower scores indicated less positive environmental attitudes. The environmental attitude section of the survey in this study had a Cronbach’s reliability coefficient of $\alpha = 0.859$.

ENVIRONMENTAL LOCUS OF CONTROL INSTRUMENT AND SCORING. The environmental locus of control section of the survey included eight

questions. Examples of survey questions included “it does not matter if people change part of the environment to meet their needs,” “if I turn off lights that are not being used, I can help create a better environment by saving energy,” and “it would take someone more popular than me to influence my friends to recycle.” Students again responded to statements using a Likert-type scale ranging from “strongly agree” to “strongly disagree” (Likert, 1967) with the most negative response scoring the fewest points (1) and the most positive response scoring the most points (5) for a total score of 40 possible points. Higher scores related to an internal locus of control while lower scores related to an external locus of control. The Cronbach’s reliability coefficient for the locus of control section of the survey was 0.676.

COMPOST KNOWLEDGE INSTRUMENT AND SCORING. The composting knowledge variable was measured by 20 true or false questions determining the general composting knowledge of each respondent. Examples of survey questions included “the nutrients in food can be recycled,” “paper is biodegradable,” and “the product of a compost pile is similar to topsoil.” Correct answers received one point and incorrect answers did not receive a point. The Cronbach’s reliability coefficient for the composting knowledge section was 0.750.

COMPOSTING ATTITUDES INSTRUMENT AND SCORING. Students reporting that their school participated in a composting program were asked 16 questions regarding attitudes toward composting. The nature of the questions asking about understanding how to sort food waste specifically on their campus required that only students with composting programs respond to this section of the survey. Examples of survey questions included “when I sort my food waste in the cafeteria/dining hall, I understand what can be composted,” “sorting meal waste is easy,” and “I check for composting instructions if I’m unsure of what to separate into the food waste bins.” Likert-type scale responses and scores ranged from “never” (1 point), “sometimes/usually” (2 points), and “always” (3 points). A maximum of 48 points were possible for this section of the survey with higher scores indicating more positive composting attitudes.

This section of the survey in this study was found to have a Cronbach’s reliability coefficient of $\alpha = 0.791$.

DEMOGRAPHIC SECTION. Demographics collected in the study included gender, ethnicity, and year in school. Demographic data were collected and used to ensure samples for each school were relatively consistent with the overall population of the schools involved and similar to each other.

DATA ANALYSIS. All of the surveys were collected and entered into an Excel (Microsoft, Redmond, WA) spreadsheet, which was converted into a file in SPSS™ (version 20.0; IBM Corp., Armonk, NY). Descriptive statistics, analysis of variance (ANOVA) and Pearson product-moment correlation tests were used to analyze the data.

Results

A total of 660 surveys were collected from the treatment and control groups. The treatment group consisted of 403 responses, whereas the control group included 257 responses. Missing answers were treated as missing values in the data set.

Demographic comparisons of the treatment and control groups found the samples were representative of the student body at each campus, but did vary accordingly in comparisons with each other. The treatment group had more females, more Hispanic students and more upperclassmen and graduate students (Table 1). These differences were reflective of contrasts in the respective campuses with Texas State University being considered a Hispanic-serving institution with more female than male enrollment and with more graduate students reflecting their efforts toward becoming an emerging research institution (Farmingdale State College State University of New York, 2015; Texas State University, 2015).

RESULTS RELATED TO COMPOST KNOWLEDGE. Results of ANOVA comparisons of compost knowledge scores found that mean scores were higher for the school with a composting program (14.69) when compared with mean scores for the school without a composting program (13.67) (Table 2). This finding was expected since students at the school with the composting program had more exposure to educational materials regarding compost. A recent study found

that 75% of Americans would compost if it was cheap and easy, but that Americans did not necessarily understand the process or the positive impacts of composting vs. landfilling on the environment (Smith, 2014). National Waste and Recycling Association's CEO S.H. Kneiss said, "Challenges include the collection and transportation of food waste and the siting of food waste composting facilities more broadly. But a far greater hurdle inhibiting an organics revolution may involve a lack of understanding by the American public about the value of such a change" (Smith, 2014).

RESULTS RELATED TO ENVIRONMENTAL ATTITUDES. Statistically significant differences were found in ANOVA comparisons of environmental attitudes of the treatment vs.

control school. The mean score for the school with the composting program was more positive when compared with the university without the composting program (83.84 compared with 82.17) (Table 2). Previous studies have found that programs developed to raise awareness about a particular environmental issue can have a more holistic effect (Skelly and Zajicek, 1998). Studies have also found that increased knowledge can lead to changes in attitudes (Bradley et al., 1999).

RESULTS RELATED TO ENVIRONMENTAL LOCUS OF CONTROL. ANOVA comparisons indicated significant differences of environmental locus of control scores. The mean score for the school with a composting program showed respondents had

a more internal locus of control (31.32) when compared with respondents at the school without the composting program (30.16) (Table 2). Increased knowledge often can have an empowering effect on individuals (Metz, 2000). In the Bobcat Blend program, students are learning about how small consistent actions can add up and make a larger impact over time. Student newspaper articles reporting cafeteria waste collection totals for the semester and year show students how their involvement in the program all adds up.

RESULTS RELATED TO COMPOST ATTITUDES. Pearson's product-moment correlations were calculated to identify the relationship between compost attitudes and environmental knowledge scores, environmental locus of control scores, and composting knowledge scores for the school with a composting program. Significant positive relationships were identified between each of the variables (Table 3). Therefore, an increase in compost knowledge was associated with an increase in positive compost and environmental attitudes and a more internal locus of control. Consequently, the hope is that by increasing educational efforts, students will develop more positive attitudes, which will lead to more positive environmental actions. Similar findings have been found with other educational programs directed at youth (Bradley et al., 1999; Edgerton et al., 2009; Smith, 2014).

DEMOGRAPHIC COMPARISONS. Treatment group scores were analyzed to determine if any particular demographic group at the university with the composting program had more positive scores in comparisons to other groups. Significant differences were found in all comparisons (Table 4).

Table 1. Descriptive statistics outlining demographic comparisons of the treatment (Texas State University, San Marcos) and control (Farmingdale State College State University of New York, Farmingdale) groups in the study of the relationship between a campus composting program and environmental attitudes, environmental locus of control, compost knowledge, and compost attitudes of college students.

Variable	Treatment group [no. (%)]	Control group [no. (%)]
Gender		
Male	111 (29)	126 (51)
Female	280 (71)	121 (49)
Ethnicity		
Caucasian	244 (63)	147 (61)
Hispanic	109 (28)	46 (19)
African-American	22 (6)	28 (12)
Asian-American	9 (2)	16 (7)
American Indian	2 (1)	3 (1)
Other	0 (0)	3 (1)
Year in school		
Freshman	58 (15)	68 (28)
Sophomore	70 (18)	57 (23)
Junior	109 (28)	52 (21)
Senior	137 (35)	66 (27)
Graduate student	21 (6)	2 (1)

Table 2. Analysis of variance comparisons of mean environmental attitude, environmental locus of control, and compost knowledge scores of students at a university with and without a composting program in the study of the relationship between a campus composting program and environmental attitudes, environmental locus of control, compost knowledge, and compost attitudes of college students.

Variable	Environmental attitudes ^a		Environmental locus of control ^b		Compost knowledge ^c	
	Mean	N	Mean	N	Mean	N
Treatment	83.84	398	31.32	400	14.69	403
Control	82.17	237	30.16	253	13.67	257
<i>P</i>	0.001*		0.001*		0.001*	

^aScores had a maximum possible score of 100 with higher scores indicating more positive environmental attitudes and lower scores indicating less positive environmental attitudes.

^bScores had a maximum possible score of 40 with higher scores indicating more feelings of internal locus of control toward the environment and lower scores indicating more feelings of external locus of control toward the environment.

^cScores had a maximum possible score of 20 with higher scores indicating compost knowledge and lower scores indicating less compost knowledge.

*Significant at $P \leq 0.05$.

Table 3. Relationship between compost attitudes score and environmental attitudes score, locus of control score, and composting knowledge score for the university with a composting program in the study of the relationship between a campus composting program and environmental attitudes, environmental locus of control, compost knowledge, and compost attitudes of college students.

	Compost attitude score ^z		
	<i>r</i>	<i>P</i>	N
Environmental attitude score ^y	0.432	0.001 *	364
Environmental locus of control score ^x	0.369	0.001 *	366
Composting knowledge score ^w	0.246	0.001 *	368

^zScores had a maximum possible score of 48 points with higher scores indicating more positive composting attitudes.

^yScores had a maximum possible score of 100 with higher scores indicating more positive environmental attitudes and lower scores indicating less positive environmental attitudes.

^xScores had a maximum possible score of 40 with higher scores indicating more feelings of internal locus of control toward the environment and lower scores indicating more feelings of external locus of control toward the environment.

^wScores had a maximum possible score of 20 with higher scores indicating compost knowledge and lower scores indicating less compost knowledge.

*Significant at $P \leq 0.05$.

In comparisons of males and females, males in the treatment group obtained more positive scores on the compost knowledge inventory while also scoring more positively regarding compost attitudes when compared with females (Table 4). Males were the minority in the sample and appeared to have responded better to the types of educational outreach and signage available in the program. Although few studies have focused on studying compost and attitudes (Edgerton et al., 2009), those that have, found that more knowledge of composting and positive attitudes toward compost were predictors to participation in composting programs.

Differences were found in comparisons of students of different ethnic backgrounds with Caucasian or American Indians scoring more positively on the compost knowledge inventory (Table 4). These findings may indicate the message of the program may be reaching the bulk of students in terms of ethnic background and also offered some insight and opportunities as to which groups could be targeted in designing future materials.

Environmental attitude differences were also seen with those students identifying as American Indian or Hispanic as having the most positive environmental attitudes (Table 4). Previous studies have often found Caucasians as having the most positive and minority groups as having less positive environmental attitudes (Aguilar et al., 2008). Texas State University is a Hispanic-serving institution with Hispanics being the second largest ethnic group represented at the institution.

Hispanics are also the largest minority group nationwide and one of the fastest growing and therefore an important demographic to target for development of proenvironmental attitudes and behaviors (Brown, 2014).

Upperclassmen, especially master's level students, showed significant differences in comparisons of compost knowledge and environmental attitudes. Results showed that as the students progressed from freshman through senior year, their scores ranked higher each year (Table 4). The Bobcat Blend program has been on campus since 2009. Upperclassmen may have been on campus for 2–3 years longer and received multiple years of exposure to the treatment leading to more positive environmental attitudes compared with underclassmen. This could have influenced their compost knowledge and awareness leading to more positive environmental attitudes. This could have also been the case for the small group of master degree students who scored exceptionally higher on both the compost knowledge and environmental attitude scores.

Discussion

Results of this study found that students participating in the survey at the school with a compost program had more knowledge of compost. These findings were encouraging since sometimes it is difficult to gauge the effectiveness of programs at educational institutions when considering the turnover of students and by examining amounts of contamination in collection bins during the active semester. Results of the study showed

that passive education efforts through the use of signage, booths, and bins appeared to be an effective tool in relaying messages about composting to university students. Terms such as “compost” and “organic waste” are not necessarily part of the general public's vernacular. With the widespread use of garbage disposals in ≈50% of homes in the United States and the large-scale use of landfills for food waste, there is an important need to develop knowledge of composting in the general population (Hickman, 2006; Kobilnyk, 2013). Results of this study also support a similar study conducted with youth in Poland, which found that a school composting program improved composting knowledge (Grodzinska-Jurczak et al., 2003).

Demographic differences were found within some comparisons. Students seemed to gain more compost knowledge as their year in school progressed and had more positive environmental attitudes (with the exception of the small sample of doctoral students). This finding was promising as the turnover of students on the campus and continuous education efforts in educating a “moving target” can feel overwhelming at times. These data seemed to show that the education efforts do take hold over time and can potentially impact not only efforts toward educating the campus population about compost, but might be influencing some bigger picture changes in terms of environmental attitudes.

Males in this study scored significantly higher on the compost knowledge and compost attitude scales. Similarly, students identifying as Caucasian or American Indian scored the most positively on the compost knowledge inventory. These findings were promising in terms of indicating that the message of the program may be reaching the bulk of students in terms of ethnic background, but also offered some insight and opportunities as to which groups could be targeted in designing future materials.

Differences were also seen with American Indians and Hispanics having the most positive scores on the environmental attitude inventory. Previous research has shown minorities, especially African-Americans and Hispanics, typically have not scored as high as Caucasians on instruments

Table 4. Analysis of variance comparisons by gender, ethnicity, and year in school of university students at the university with a composting program in the study of the influence of a composting program on environmental attitudes, environmental locus of control, composting knowledge, and composting attitudes.

Variable	Environmental attitudes ^z		Environmental locus of control ^y		Compost knowledge ^x		Compost attitudes ^w	
	Mean	N	Mean	N	Mean	N	Mean	N
Gender								
Males	83.88	110	31.05	111	15.86	111	33.85	95
Females	83.74	276	31.36	279	14.53	280	31.95	266
<i>P</i>	0.325		0.257		0.001*		0.039*	
Ethnicity								
American Indian or Alaskan	86.00 ab	2	32.50	2	16.00 ab	2	30.50	2
Asian or Pacific Islander	83.00 ab	9	31.22	9	13.89 ab	9	30.38	8
African-American	77.36 a	22	29.76	21	13.41 a	22	30.29	21
Hispanic	84.88 ab	109	31.65	108	14.42 b	108	32.60	104
Caucasian	83.41 ab	244	31.23	244	15.21 b	244	32.60	220
<i>P</i>	0.014*		0.300		0.003*		0.515	
Class								
Freshman	82.33 a	57	31.03	58	14.29 a	58	32.12	57
Sophomore	83.13 a	70	31.57	70	14.56 a	70	31.53	66
Junior	83.92 a	107	30.81	109	14.66 ab	109	32.30	101
Senior	83.97 ab	135	31.36	136	15.29 ab	137	32.88	128
Master's level	90.67 b	15	33.73	15	16.87 b	15	35.20	10
Doctoral level	80.00 ab	6	30.00	5	14.33 a	6	32.50	2
<i>P</i>	0.046*		0.078		0.004*		0.589	

^zScores had a maximum possible score of 100 with higher scores indicating more positive environmental attitudes and lower scores indicating less positive environmental attitudes.

^yScores had a maximum possible score of 40 with higher scores indicating more feelings of internal locus of control toward the environment and lower scores indicating more feelings of external locus of control toward the environment.

^xScores had a maximum possible score of 20 with higher scores indicating compost knowledge and lower scores indicating less compost knowledge.

^wScores had a maximum possible score of 48 points with higher scores indicating more positive composting attitudes.

*Statistically significant at the 0.05 level.

Means followed within columns are not significantly different as measured by the Tukey's means separation test at $P = 0.05$.

measuring concern for the environment (Kellert, 1985; Sheppard, 1995; Waliczek and Zajicek, 1999), and that differences are sometimes tied to other variables are interdependent with ethnicity such as socioeconomic status, education level, priority of needs, and level of acculturation (Caro and Ewert, 1995; Sheppard, 1995; Waliczek and Zajicek, 1999). This finding was reassuring since Hispanics are the second largest ethnic group on campus and a growing group within the United States.

A positive correlation was also found with an increase in compost knowledge being associated with an increase in positive compost and environmental attitudes and a more internal locus of control. Previous studies have indicated younger students, such as elementary to middle school-aged children, should be targeted to make the greatest impact in sparking new interests and making subject matter relevant (Maltese and Tai, 2009). However, this study showed promise in impacting adults. Although education is important, research has also found that positive

role models are a force for change. Some research found that table tents and signage did not influence composting behavior in a public food court as much as having role models exhibiting proper composting behavior (Sussman and Gifford, 2013). By educating future role models through college students, positive change may be further instituted.

Recommendations for future research include expanding this study to include more schools in both the treatment and control groups to allow expanded generalization of the results. This study provided primarily preliminary results that suggest further research would be critical in the development of composting programs that can help improve environmental attitudes.

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