Service-Learning in Higher Education: Student Outcomes of a Canine Training Program

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Abstract

Service-learning can be broadly defined as a balance between service to the community and academic learning. Service-learning activities also provide many benefits for students regarding learning outcomes, perspective changing, personal growth, and civic responsibility. Furthermore, human-animal interaction has also been associated with increased wellbeing, life satisfaction, positive emotions, decreased loneliness, and relief of symptoms of depression and PTSD. Dogs living in shelters are exposed to an array of negative stressors, which can result in the development of behavioral issues. However, it has been proposed that human interaction with shelter dogs can help correct specific behaviors to alleviate some of these symptoms to transition into an adoptive home. The present study sought to analyze possible benefits of a semester-long service-learning program involving human-animal interaction at a local animal shelter. Seventy-nine students enrolled in an upper-division learning and behavior course had the opportunity to either participate in a behavioral modification project involving humans, or a behavioral modification program in which students worked with dogs at a local humane society. This study examined variables regarding wellbeing, attitudes towards animals, and course outcomes using a pre and posttest, quasi-experimental design. Students working with the dogs reported more positive mood and scored higher on the Service-Learning Benefit Scale at the posttest. The findings of this study support the notion that implementing a service-learning activity is worthwhile for student development. The results of this study and future studies can pave the way for positive changes in higher education curricula to promote student learning and development.

Service-Learning in Higher Education: Student Outcomes of a Canine Training Program

Each year, approximately 3.3 million dogs are admitted to animal shelters, and over half a million dogs living in shelters are euthanized (ASPCA, n.d.). Unfortunately, dogs living in shelters are exposed to an array of negative stressors including isolation, exposure to a new environment, and loss of routine (Moulton, Wright, & Rindy, 1991). Additionally, when compared to dogs living at home, dogs living in shelters experience elevated cortisol levels (Hennessy, Davis, Williams, Mellott, & Douglas, 1997). As a result, many dogs living in this environment may suffer from behavioral issues that can lengthen their stay at a shelter (Tuber et al., 1999). However, it has been proposed that human interaction with shelter dogs can help correct specific behaviors to alleviate some of these symptoms to transition into an adoptive home (Tuber et al., 1999). In order to relieve some of these issues regarding shelter animals, service-learning programs can be developed and implemented in college classrooms.

Service-Learning

Service-learning can be broadly defined as a balance between service to the community and academic learning (Eyler & Giles, 1999; Hickey, 2016). Typically, service-learning programs are implemented in secondary education settings, in which students directly apply what they have learned in class to a real-world situation. Service-learning differs from volunteering or community service since students are receiving academic credit for their participation. Further, the service-learning activity is directly related and integrated in the course in which they are enrolled. Within the field of psychology, critical components of successful curricula have been identified previously (Brewer, 1997; Bringle & Duffy, 1998). These components include opportunities for students to be active in their learning, understanding ethical issues, understanding diversity, and helping students understand psychology through experience.

Educators within psychology support service-learning programs since these activities encourage student engagement within the community (Bringle & Duffy, 1998). Additionally, students have the opportunity to reflect on their experiences to enhance their understanding of course content. Service-learning activities also provide many benefits for students regarding learning outcomes (Kolb, 1984; Mayer & Wittrock, 2006), perspective changing (Astin, Vogelgesang, Ikeda, & Yee, 2000; Jones & Abes, 2004; Lawson, Cruz, & Knollman, 2017), personal growth (Astin & Sax, 1998; Lundy, 2007), and civic responsibility (Condon, Grimsley, Knaack, Pitz, & Stehr, 2015; Hébert & Hauf, 2015).

It has been suggested that learning through experience is beneficial for students in terms of knowledge construction (Kolb, 1984; Mayer & Wittrock, 2006). Since service-learning is a type of experiential learning in which students apply what they have learned in class to a real-world situation, students' knowledge should be enhanced because they are more directly involved in their learning (Kolb, 1984). However, there are mixed findings regarding academic success. It has been found that students believe their knowledge increased from service-learning (Hébert & Hauf, 2015), but these perceptions of enhanced knowledge are not always reflected in final course grades. Strage (2004) reported modest differences in final grades, which favored service-learning students over non service-learning students, but the differences were not robust enough to produce statistically significant results. Despite this, there are many other benefits for students participating in service-learning that should not be overshadowed by the minimal evidence pertaining to learning outcomes.

Students participating in a service-learning activity are often exposed to different perspectives and ways of life (Astin, Vogelgesang, Ikeda, & Yee, 2000; Jones, & Abes, 2004). Thus, service-learning can be used to promote student development by changing their personal

views regarding a specific group or population. For instance, Lawson et al. (2017) evaluated

students' perspectives of individuals with disabilities before and after participating in a service-

learning program working with these individuals. It was found that students with no prior

experience working with individuals with disabilities had more positive attitudes towards

individuals with disabilities at the posttest. Furthermore, by evidence of reflection exercises,

service-learning activities enhance the development of critical thinking skills, leading to a richer

understanding of social issues (Ash, Clayton, & Atkinson, 2005). Additionally, students

participating in a service-learning program experience greater civic responsibility, increase drive

for social justice, and volunteerism (Condon et al., 2015; Niemi, 1974).

Astin and Sax (1998) reported that students participate in service-learning for three main

reasons: to help other people, to feel personal satisfaction, and to improve their community.

Regarding personal outcomes, it has been found that individuals who participate in service-

learning experience greater empathy (Lundy, 2007). Increased empathy has been found to be

related to overall well-being (Shanafelt et al., 2005; Wei, Liao, K. Yu-Hsin, Tsun-Yao, &

Shaffer, 2011). Additionally, service-learning participation has been correlated with enhanced

self-esteem, which is positively associated with happiness (Campbell, 1981; Myers, & Diener,

1995).

In conjunction with student benefits, benefits for the community have been observed with

service-learning programs. Community organizations, who may otherwise function solely from

community volunteers, now have the assistance of students in service-learning programs. Astin

et al. (1999) found that college students who participated in a service-learning program were

more likely to participate in their community after graduation, resulting in a ripple effect of

community involvement. Evidently, community organizations, such as animal shelters, can greatly benefit from service-learning programs.

Human-Animal Interaction

As stated previously, participation in service-learning results in positive outcomes for students and service-learning opportunities in an animal shelter can provide benefits for animals living at the shelter (Tuber et al., 1999). Students may also experience benefits from interaction with shelter animals. The extent of the human-animal bond has been a popular area of interest in the past couple of decades. Human-Animal Interaction (HAI) research has mainly focused on the effects of Animal Assisted Therapy (AAT), Animal Assisted Activities (AAA), and pet ownership. AAT and AAA differ from pet ownership, since the interactions with animals tend to be more short-term when compared to owning a pet. Despite this difference, there are some positive outcomes that do overlap between these two types of interactions.

Pet ownership is associated with increased wellbeing, life satisfaction, subjective happiness, and increased positive emotions (Bao & Schreer, 2016). Compared to non-pet owners, people who owned pets reported higher scores in life satisfaction. However, the groups did not differ in subjective happiness and positive emotions. It is worth noting that most participants in this study had owned their pets for about five years. Thus, Bao (2016) suggested that people may experience elevated levels of happiness when first bringing home a pet, but that happiness may return to normal after living with the pet for a while. Pets, specifically dogs, can successfully fulfill an individual's social needs regardless of whether that individual is close to other humans (McConnell, Brown, Shoda, Stayton, & Martin, 2011). Following this social support from pets, humans experience enhanced wellbeing including decreased feelings of loneliness and increased self-esteem. In some cases, humans even turn to their pet when experiencing emotional distress

(Kurdek, 2008), suggesting that pets may function similarly to attachment figures (Sable, 2013). Some studies have also found that pet ownership is associated with overall enhanced physical health (Müllersdorf, Granström, Sahlqvist, & Tillgren, 2010; Headey & Grabka, 2011). Clearly, there are many benefits from our long-term interactions with animals that influence overall psychological and physiological health.

As stated previously, many research studies note the positive effects of pet ownership, but what about brief interactions with animals? Despite not spending as much time with an animal in activities such as AAA or AAT, there is evidence to suggest that these short-term activities involving animals can help alleviate symptoms of depression (Souter & Miller, 2007) and Post-Traumatic Stress Disorder (PTSD; Mims & Waddell 2016). It can be inferred that because enhanced wellbeing results from the reduction of these symptoms, individuals who do not suffer from depression or PTSD could also experience enhanced wellbeing from these interactions alone. Thus, it could be hypothesized that a service-learning program involving animals would have similar positive effects experiences in AAA or AAT.

McDonald, Caso, and Fugit (2005) examined the effects of a service-learning activity involving shelter animals that was implemented in a psychology learning and behavior course. While these researchers did not explore the impact of this service-learning opportunity on student well-being, they did assess student perceptions of knowledge gained from the experience. The results of this study indicated that students did feel that their knowledge increased and were able to better understand operant principles. However, these results are based on qualitative data, thus there were no empirically grounded measurements used to assess whether students participating in the service-learning activity did better academically than students who did not. Furthermore, the program was only a single, six-hour session, so it could be difficult to conclude

that the six hours alone greatly increased course knowledge. Hence, there is a need to assess the benefits of a semester-long service-learning program involving shelter animals by utilizing pre and posttest measurements.

Current study

The present study sought to analyze possible benefits of a semester-long service-learning program involving human-animal interaction at a local animal shelter. Students enrolled in an upper-division learning and behavior course had the opportunity to either participate in a behavioral modification project involving humans, or a behavioral modification program in which students worked with dogs at a local humane society. It was predicted that students who conducted behavioral modification with dogs at a local humane society would score higher on the Service-Learning Benefit Scale, demonstrate greater knowledge of course material, express more positive attitudes towards animals, experience greater wellbeing, more positive mood, and less negative mood as compared to students who conducted behavioral modification involving humans. It was also hypothesized that students who owned pets would express more positive attitudes toward animals and experience greater wellbeing, more positive mood, and less negative mood as compared to students who did not own pets.

Methods

Behavioral Modification Project

Behavior Analysis Research with Canines (BARC) and Behavioral Modification (BMOD) programs represent the different applied laboratory activities in which students could participate during a semester-long upper division learning and behavior course. The BARC program involved students applying their knowledge of behavior modification to train dogs at Butte Humane Society in Chico, CA. Students participated in pairs for three hours a week for

eight weeks and collected data on the dog's progress in training. To collect data, students followed modules on Qualtrics. Students would visit the shelter twice a week and had different tasks on the first and second visit. The first session of the week served as a preparation for the second session, in which students would identify specific behaviors they wanted to work on in the second session in order to train the dog to perform the task. During the second session, the training session occurred, and students would record the data from their training session. The training consisted of simple commands, such as "sit" or "shake," kennel presentation, or walking on a leash. The students would periodically present their data to the class to reflect on how the training was progressing.

Students completing the BMOD program modified the behavior of other humans or modified the behavior of their pet. The students were able to choose their subject and which behavior to modify. The subject they chose self-disclosed a behavior that they wanted to modify over the eight-week period. Data would be collected in two-week intervals using pen and paper. Students would record baseline data of the individual for the first two weeks and implement the behavioral modification program for the following two weeks. Then, students collected two weeks of baseline data to see if the intervention is working, and finally implement the behavioral modification program for the last two weeks. Like the BARC program, the students in this lab would also present their data to the class. It should be noted that there were eight students who elected to train their own pets for their BMOD project.

Participants

Participants consisted of 79 students enrolled in a Learning and Behavior course at California State University, Chico. Only participants enrolled in this course were recruited for the study. There were 52 females and 27 males, with the average age being 23 years old ($SD =$

5.58). In terms of ethnicity, 39.2% of participants identified as Caucasian, 35.4% as Hispanic,

8.9% as Asian, 8.9% as biracial or other, 6.3% as Black or African American, and 1.3% as

American Indian or Alaskan Native. There were 42 students in the BARC program and 37

students in the BMOD program. Forty participants owned a pet, and 39 participants did not own

a pet. Participants received extra credit in the learning and behavior course for their participation.

Materials

Wellbeing. Wellbeing was measured using three scales: Satisfaction with Life Scale (SWLS;

Diener, Emmons, Larsen, & Griffin, 1985), Subjective Happiness Scale (Lyubomirsky &

Lepper, 1999), and the Positive and Negative Affect Schedule (PANAS; Watson, Clark, &

Tellegen, 1988). The Satisfaction with Life Scale consists of five items using a 7-point Likert

scale. Higher scores indicated more satisfaction with life. SWLS showed good pre and posttest

reliability ($\alpha = .79$, $\alpha = .87$, respectively). The Subjective Happiness scale consists of four 7-

point Likert scale items which assess an individual's happiness. A higher score indicates that the

individual experiences more happiness. The subjective happiness scale showed good reliability

(pretest $\alpha = .81$, posttest $\alpha = .83$). The Positive and Negative Affect Schedule consists of two 10-

item scales, one with positive attributes and one with negative attributes. Participants were asked

to rate each item in terms of how often they felt that emotion over time. Examples of positive

affect items are active, excited, determined, and proud. The positive affect subscale showed good

reliability (pretest $\alpha = .89$, posttest $\alpha = .89$). Negative affect consists of items such as hostile,

guilty, upset, and afraid. Higher scores on the positive item subscale indicate more positive

affect, while higher scores on the negative item subscale indicate more negative affect. The

negative affect subscale showed good reliability (pretest $\alpha = .89$, posttest $\alpha = .89$).

Attitudes towards animals. Attitudes towards animals were assessed with the Animal Attitude

Scale (AAS-10; Herzog, Grayson, & McCord, 2015) and a modified version of the Pet Attitude

Scale (PAS-M; Templer et al., 1981; Munsell et al., 2004). The AAS-10 scale consists of 10

items using a 5-point Likert scale. Participants indicated the extent to which they agreed with

statements regarding animals such as, "It is morally wrong to hunt animals" or "I sometimes get

upset when I see wild animals in cages at zoos." The AAS-10 demonstrated acceptable pre and

posttest reliability ($\alpha = .75$, $\alpha = .81$, respectively). The PAS-M consists of 18 items with a 7-

point Likert scale. Participants indicated the extent to which they agreed with statements

regarding pets such as, "House pets add happiness to my life" or "I spend time every day playing

with my pet." The PAS-M showed good pre and posttest reliability ($\alpha = .90$, $\alpha = .85$,

respectively). For both scales, higher scores indicate more positive attitudes towards animals.

Furthermore, to assess whether students believed specific myths regarding shelter animals, six

true or false statements were presented. These true or false statements were collected from the

ASPCA website and are common myths and misconceptions. Responses from the myths were

combined, however, yielded a low Cronbach's alpha at the pre and posttest ($\alpha = .42$, $\alpha = .35$,

respectively). Therefore, each myth was analyzed individually.

Course outcomes. Perceived course outcomes were measured with a series of Likert statements

regarding course outcomes and experiences, such as expected grade, time spent on course, and

perceived increase in course knowledge, with higher scores indicating that students agreed with

these statements. Furthermore, with student consent, anonymous reporting of final course grades

were collected from the professor of the course and converted to a 4.0 grading scale. The

Service-Learning Benefit Scale (SELEB; Toncar, Reid, Burns, Anderson, & Nguyen, 2006) was

used to measure student's perceptions and attitudes regarding their service-learning experience.

Participants were first presented with 20 statements with a 7-point Likert scale to assess to extent

to which the class project provided them with certain educational experiences. Sample items

include personal growth, conflict resolution, and applying knowledge to the real world. Higher

scores indicate being provided with many educational experiences. Additionally, 10 similar

items were presented using a 7-point Likert scale to assess the extent to which students felt that

certain educational experiences were important to them. The SELEB scale showed good

reliability ($\alpha = .955$).

Procedure

Using Qualtrics, participants first completed the online pretest during lab before

beginning the BARC or BMOD program. The pretest consisted of the assessment of wellbeing,

attitudes towards animals, shelter animal myths, positive and negative mood, and questions about

pet ownership. Participants took approximately 15 minutes to complete the pretest.

After participants completed BARC and BMOD programs, they completed the posttest

online during lab. The posttest consisted of the same measures as the pretest. In addition to these

measures, the posttest also assessed student outcomes regarding the course and their perceptions

and attitudes towards their lab activity (BARC and BMOD program). With the consent of the

students, anonymous reporting of grades was also collected.

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Results

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Data collection took place over two semesters. There were 39 students in the spring

semester and 40 students in the following semester. A one-way MANOVA was used to examine

possible differences across dependent variables as a function of semester of participation (spring

2018, fall 2018). For both pre and posttest measures, no significant multivariate effects were

found. Therefore, data of students from both semesters were combined and analyzed together.

Students self-selected into the BARC or BMOD programs (see table 1). To be sure that there were no selection effects due to pet ownership, lab activity and pet ownership was examined in a 2 (BARC, BMOD) x 2 (pet ownership yes, no) chi-square analysis. Results of the chi-square test were not significant.

Table 1

Participant distribution of lab activity (BARC, BMOD) and pet ownership (yes, no)

	Pets	
Lab	YES	NO
BARC	19	23
BMOD	21	16

A series of independent samples t-tests were used to examine the differences between BARC and BMOD groups on pre and posttest measures (see table 2). There was only one significantly different pretest measure; participants in the BARC program ($M = 37$, $SD = 5.3$) scored higher on the AAS than the BMOD students ($M = 34$, $SD = 7.6$), $t(77) = 2.11$, $p = .047$.

For posttest measures, BARC and BMOD groups differed significantly on three measures. Participants in the BARC program ($M = 37.29$, $SD = 7.16$) showed more positive mood than those in the BMOD program ($M = 33.32$, $SD = 7.77$), $t(77) = 2.36$, $p = 0.21$. Additionally, BMOD participants ($M = 25.27$, $SD = 9.11$) showed more negative mood than BARC participants ($M = 20.98$, $SD = 7.37$), $t(77) = -2.313$, $p = .023$. Finally, students in the BARC program ($M = 117$, $SD = 16.17$) scored higher on the SELEB scale as compared to

students in the BMOD program ($M = 91.51$, $SD = 24.24$), $t(77) = 5.56$, $p < .001$. Differences

between BARC and BMOD on each item of the SELEB scale can be seen in table 3.

A series of independent samples t-tests were used to examine the differences between pet

owners and non-owners on pre and posttests measures. No significant differences between the

groups were found across all dependent variables, suggesting that pet ownership did not

influence the results of this study as much as the service-learning activity.

Table 2

Results of t-tests for pre and posttest measures by lab activity

Variable	Pre-Test		Post Test	
	Mean	SD	Mean	SD
AAS-10				
BARC	37*	5.3	37.43	6.23
BMOD	34.05*	7.61	34.89	7.0
PAS-M				
BARC	107.28	11.07	108.31	10.44
BMOD	103.32	18.06	104.51	12.49
SWLS				
BARC	22.57	5.76	24.26	5.6
BMOD	23.27	5.97	24.51	5.8
HAPPY				
BARC	18.9	4.07	19.55	4.38
BMOD	18.65	4.89	19.24	3.66
PANAS (positive)				
BARC	36.4	7.02	37.29*	7.16
BMOD	34.95	8.04	33.32*	7.77
PANAS (negative)				
BARC	22.9	8.03	20.98*	7.38
BMOD	24.05	8.2	25.27*	9.11
SELEB				
BARC	-	-	117.0**	16.17
BMOD	-	-	91.51**	24.24

* indicating mean differences at the .05 level
** indicating mean differences at the .001 level

Analyses of covariance (ANCOVA) were conducted to compare each posttest dependent variable between BMOD and BARC participants. Results of the ANCOVAs for two dependent variables were statistically significant: positive mood and negative mood. For positive mood, the assumption of homogeneity of regression slopes was met. Controlling for the pretest, positive mood differed significantly between the two programs, $F(1, 76) = 178.38$, $p = .022$, $\eta = .25$. It was found that students in the BARC program ($M = 37.29$, $SD = 7.16$) showed more positive mood in the post test than those in the BMOD program ($M = 33.32$, $SD = 7.77$). The analysis established that differences in positive mood as reported on the posttest were independent of the pretest scores. For negative mood, the assumption of homogeneity of regression slopes was met. Controlling for the pretest, negative mood differed significantly between the two programs, $F(1, 76) = 247.3$, $p = .016$, $\eta = .27$. It was found that students in the BMOD program ($M = 25.27$, $SD = 9.11$) expressed more negative mood on the posttest than those in the BARC program ($M = 20.98$, $SD = 7.38$). The analysis established that differences in negative mood as reported on the posttest were independent of the pretest scores.

To examine the extent to which students in each program believed common shelter myths a 2 (BARC, BMOD) x 3 (true, neither/unsure, false) chi-square analysis was used for each myth. Frequencies and percentages for each myth are shown in table 4. Regarding the pretest, statistically significant chi-square tests were found for two of the five myths. Students in the BARC program rated the myth "The major reasons dogs end up in shelters is because they were seized in criminal cases or were too aggressive to own safely," as false more than expected, while students in the BMOD program rated the myth as true more than expected, $\chi 2$ (2, N = 79) = 8.01, $p = .02$, $V = .32$. Students in the BARC program rated the myth, "Shelter animals are just

as clean as pet store animals," as true more than expected, while students in the BMOD program rated this myth as false more than expected, $\chi2$ (2, N = 79) = 6.63, p = .04, V = .29. All other chi-square analyses in for the pretest myths were not significant. Possible differences in beliefs of animal shelter myths were also explored on the posttest using a chi-square analysis for each myth. A statistically significant chi-square was found for one myth: "Getting animals from breeders is safer because the breeders know the animal's bloodline and family history." Students in the BARC program rated this myth as false more than expected, while students in the BMOD program rated this myth as true more than expected, $\chi2$ (2, N = 79) = 6.4, p = .04, V = .29.

To assess differences in course outcomes and attitudes, a series of independent samples t-tests were used with program (BARC, BMOD) as the independent variable and each course outcome measure as a dependent variable. Of the 67 participants who agreed to report their final grade, 39 were students in the BARC program and 28 in the BMOD program. There were no differences found between the students in the BMOD program and students in the BARC program for final course grade. However, when students were asked if the program increased their knowledge more than other assignments in the class, students in the BARC program (M = 4.33, SD = .72) felt that the activity did increase their knowledge more than the students in the BMOD program reported (M = 3.95, SD = .97), t(77) = 2.03, p = .046. Furthermore, students in the BARC program (M = 3.76, SD = .91) felt that they spent more time on the course outside of class meetings than students in the BMOD program (M = 3.3, SD = .74), t(77) = 2.48, p = .015.

Table 3

Results of t-tests for differences between BARC and BMOD on SELEB scale items

	BARC		BMOD	
Benefit	Mean	SD	Mean	SD
Personal Growth*	5.81	1.11	4.95	1.60
Ability to Work Well with Others**	6.07	.95	5.57	1.64
Leadership Skills**	5.76	1.23	4.29	1.62
Communication Skills**	6.15	.93	4.92	1.46
Understanding Cultural and Racial Differences	3.83	1.96	4.49	1.95
Social Responsibility and Citizenship Skills**	5.81	1.15	3.78	1.92
Community Involvement**	6.31	.95	3.16	1.75
Applying Knowledge to the Real World	6.21	1.12	5.65	1.42
Problem Analysis and Critical Thinking	5.98	1.07	5.49	1.61
Social Self-Confidence*	5.48	1.59	4.27	1.90
Conflict Resolution*	5.67	1.18	4.64	1.74
Ability to Assume Personal Responsibility*	5.83	1.32	4.65	2.00
Develop Caring Relationships**	6.10	1.05	4.70	1.85
Being Trusted by Others**	5.95	1.32	4.51	1.95
Empathy and Sensitivity to the Plight of Others**	5.90	1.12	4.62	1.75
Workplace Skills**	5.48	1.47	3.81	1.97
Ability to Make a Difference in the Community**	6.29	.92	3.73	1.77
Skills in Learning from Experience*	6.45	.83	5.51	1.52
Organizational Skills	5.62	1.34	5.19	1.65
Connecting Theory with Practice	6.31	.90	5.84	1.36

*Indicating mean differences at the .01 level
**Indicating mean differences at the .001 level

Table 4

Frequency of student perceptions of shelter myths

Myth		Pretest Frequency (%)			Posttest Frequency (%)		
		T	N	F	T	N	F
1. The major reason dogs end up in shelters is because they were seized in criminal cases or were too aggressive to own safely.	BARC	0 (0)	16 (20)	26 (33)	1 (1)	9 (11)	32 (41)
	BMOD	6 (8)	9 (11)	22 (28)	3 (4)	10 (13)	24 (30)
2. Shelter animals are just as clean as pet store animals.	BARC	26 (34)	13 (16)	3 (4)	32 (41)	9 (11)	1 (1)
	BMOD	13 (16)	16 (20)	8 (10)	20 (25)	15 (19)	2 (3)
3. Older cats and dogs will not bond with new owners.	BARC	3 (4)	3 (4)	36 (45)	0 (0)	2 (3)	40 (51)
	BMOD	2 (3)	4 (5)	31 (39)	1 (1)	4 (5)	32 (40)
4. A shelter animal should be given as a gift.	BARC	7 (9)	18 (23)	17 (21)	6 (8)	22 (28)	14 (18)
	BMOD	8 (10)	18 (23)	11 (14)	8 (10)	13 (17)	15 (19)
5. Getting animals from breeders is safer because the breeders know the animal's bloodline and family history.	BARC	2 (3)	15 (19)	25 (31)	0 (0)	13 (16)	29 (37)
	BMOD	2 (3)	11 (14)	24 (30)	4 (5)	15 (19)	18 (23)

Discussion

The results of this study established that there are positive outcomes that result from participation in a service-learning program. Due to the relatively even distribution of lab activity by pet ownership, it can be inferred that the differences between BARC and BMOD students were due to the service-learning activity and not pet ownership. At the end of the semester, students who participated in the BARC program expressed more positive mood and less negative mood than those in the BMOD program. However, no other significant differences were found for the remaining variables of wellbeing nor attitudes towards animals. Students participating in the BARC program interacted with dogs in a time frame similar to that of AAT and AAA. Hence, it was predicted they would experience greater wellbeing, including more satisfaction with life and general happiness. However, this was not the case. This could be because mood is more fluid in nature and may fluctuate more than satisfaction with life, overall happiness, or attitudes towards animals.

Interestingly, there were no consistent differences found between the two programs regarding shelter animal myths. This could be because the BARC students presented their progress to the class throughout the semester, so BMOD students were regularly interacting with students that were visiting the shelter and may have become informed of the myths. The myths were developed specifically for the current study. The inconsistent findings might be due to the approach used to assess knowledge and myths of shelter animals. It would be valuable to continue to explore methods to assess accurate knowledge and myths associated with shelter animals. Understanding how individuals perceive animals available for adoption at shelters could lead to higher adoption rates.

Furthermore, there were also no differences between pet owners and non-pet owners. Due to the research that supports the idea that pet ownership does have positive benefits for overall wellbeing (McConnell et al., 2011; Bao & Schreer, 2016), it was expected in the present sample. Other research supports the findings of this study that, in some cases, there are no positive psychological benefits associated with pet ownership (Herzog, 2010; Müllersdorf et al., 2010; Miltiades & Schearer, 2011). Herzog (2011) identified that within the area of HAI, there are many studies with methodological issues that can be contributing to the oversaturation of findings that support the positive outcomes of pet ownership, with the main issue being the lack of experimental manipulations in pet ownership studies. Many conclusions regarding the positive effects of pet ownership are based on self-report, correlational data. Thus, we are unable to conclude whether pet ownership causes enhanced wellbeing, or if happier individuals choose to own pets. Due to these contradictory findings, more research is needed in the area of HAI to establish more concrete conclusions.

Students who participated in the BARC program and students who participated in the BMOD program did not differ in final course grade. However, it is suggested that typical measures of academic performance, such as exams, may not be adequate indicators of the skills gained in service-learning programs (Mpofu, 2007). Consistent with the findings of McDonald et al. (2015), students who participated in the BARC program did report a perceived increased knowledge as compared to students who completed the BMOD program. Future research should further explore this relationship between student perceptions of knowledge enhancement and actual grade reported. Students in the BARC program also reported spending more time on the course outside of class, as compared to students in the BMOD program. Students had to drive to the animal shelter and coordinate their participation with others in the course. This may explain

the perception of spending more time. Students in the BARC program most likely did spend more time on the course than students in the BMOD program.

BARC participants scored higher on the SELEB scale, indicating that they felt the service-learning activity provided them with many enriching academic benefits, including leadership skills, community involvement, learning from experience, and personal growth. This finding is consistent with previous research on the benefits of service-learning (Toncar et al., 2006). The BARC program differed from the BMOD program in several ways. For example, it is unknown if the higher scores on the SELEB scale were due to the service-learning component in the BARC program or other differences between the BARC and BMOD program. It is possible that since the students were working in pairs for the BARC program, they could have been more satisfied with the academic experience. This collaboration could have influenced their responses to some of the items on the SELEB scale, such as leadership skills, working with others, or communication skills. While BARC and BMOD did not differ on items such as connecting theory to practice or applying knowledge to the real world, there were still unique benefits from the BARC program that were not experienced by the BMOD students, such as making a difference in the community and experiencing enhanced social responsibility. Thus, students do indeed benefit from participating in a service-learning activity.

There were several limitations of this study. First, being a quasi-experimental design, cause and effect conclusions cannot be established due to self-selection of groups. Furthermore, the data were from an online, self-report survey. Therefore, there is no way of knowing if participants responded truthfully and accurately. Also, because this study was a pre and posttest design, participants could have answered items on the posttest similarly to the pretest. Additionally, the significant findings of this study yielded small effect sizes so a larger sample

size would be needed to find more robust effects. Ideally, future research would implement a true experimental design in order to eliminate self-selection effects.

Conclusion

Furthermore, despite some of the non-significant outcomes, the findings of this study support the notion that implementing a service-learning activity is worthwhile for student development. More research needs to be done in both areas of service-learning and HAI. The results of this study and future studies can pave the way for positive changes in higher education curricula to promote student learning and development, as well as encourage greater student involvement in their communities.

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