



# Charity- and project-based service learning models increase public service motivation outcomes among dietetic students in a community nutrition course

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## Abstract

**Objective:** To determine whether dietetic students would report a change in their public service motivation (PSM) following a community nutrition service learning (SL) course, and whether the SL model (charity *v.* project) influences this change differently.

**Design:** Using a pretest–posttest, nonequivalent groups quasi-experimental design, this study compared students' PSM at the beginning and end of a 15-week college-level course. PSM and four component dimensions (attraction to public policy, commitment to public interest, compassion and self-sacrifice) were measured via electronic survey using the PSM scale. Average PSM scores were compared between and within the charity and project groups using independent samples and paired sample *t* tests, respectively. ANCOVA assessed the effect of SL model on post-survey scores, controlling for pre-survey scores.

**Setting:** Public university in northeastern United States.

**Participants:** Dietetic students enrolled in six sections of the same undergraduate community nutrition SL course. Students were placed by section in either charity (*n* 59) or project (*n* 52) SL experiences and required to complete 14 h in this role.

**Results:** Mean PSM total scores increased between pre-survey and post-survey (3.50 *v.* 3.58; *P* = 0.001). Students reported small increases in three PSM dimensions: commitment to public interest, compassion and self-sacrifice (all *P* ≤ 0.01). Holding pre-scores constant, the charity group reported a higher attraction to public policy post-score, while the project group reported a higher self-sacrifice post-score (both *P* < 0.05).

**Conclusions:** Educators should consider adopting SL methods into curricular offerings to enhance students' motivation for public service.

**Keywords**  
Community nutrition  
Education  
Dietetics  
Public service motivation  
Service learning

Experiential learning is the integration of real-life experience into educational curriculum, with the goal that students can apply the knowledge gained outside of the classroom<sup>(1)</sup>. Service learning (SL) is one type of experiential learning where students learn in the classroom about the positive effects they can have in the community and then work to achieve these effects first-hand. These service experiences are designed to provide benefits for both the students and community members. Communities benefit from the services they receive, while students gain knowledge, awareness and skills<sup>(2)</sup>. Research using both student-reported measures and empirical data has shown that SL pedagogy increases students' civic engagement, academic

performance and knowledge of stereotypes and diversity<sup>(3–5)</sup>.

Implementing SL into college-level courses can be challenging, since SL can take many forms. Morton<sup>(6)</sup> discusses SL as a set of three paradigms based on the concern for root causes of social issues and investment in relationships. At the lowest level, the 'charity' paradigm exhibits low concern and low investment. Although charity-based SL opportunities have good intentions, the service can worsen community problems by making recipients dependent on those performing the service. The 'project' paradigm is characterised by mid-level concern and investment. Project-based SL models show great potential for positive

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and long-lasting impacts on the community but can incur unintended negative impacts such as an increased awareness of power inequalities by community members themselves. Last, the 'social change' paradigm displays high concern and high investment. The goal of a social change-based SL programme is to uncover extraneous circumstances and reveal the root causes of a community issue, allowing for programme development to address these root causes and result in the 'empowerment of the systematically disenfranchised'<sup>(6)</sup>.

When used appropriately, SL can affect students' motivation to participate in civic life. For example, participation in an SL course was shown to decrease self-oriented motives and increase awareness of civic duty<sup>(7)</sup>. However, these results rely heavily on programme design and the instructor's methods, and it may take an enrolment period longer than one semester to see significant results<sup>(7)</sup>. Additionally, it is not clear how students' motivations to help the less fortunate relate to students' chosen method of service or future career. In one study by Morton<sup>(6)</sup>, when asked how the students felt they could make the biggest impact right now, most responded, 'providing direct service to another person.' In contrast, when asked how the students felt they could make the biggest impact throughout their life, most replied, 'helping to set up and support community service organizations that are addressing immediate community needs'<sup>(6)</sup>. Further research is needed to explore how SL courses impact students' motives for public service and whether these motives differ by SL type.

To determine one's motivation for public service, Perry<sup>(8)</sup> created the public service motivation (PSM) scale to measure 'an individual's predisposition to respond to motives grounded primarily or uniquely in public institutions.' The PSM scale uses twenty-four items to assess four dimensions of public service: attraction to public policy-making, commitment to the public interest, compassion and self-sacrifice<sup>(8)</sup>. The PSM scale corresponds to certain outcome measures like job satisfaction<sup>(9,10)</sup>, performance<sup>(9)</sup>, psychological empowerment<sup>(11)</sup> and innovative behaviour<sup>(11)</sup>, while dimension ratings tend to differ by gender<sup>(12)</sup>, employment<sup>(13)</sup> and religious and family socialisation<sup>(14,15)</sup>. Research has also examined the antecedents of PSM. While it has been widely theorised that females and older individuals would report higher PSM scores, recent studies show mixed results about the effects of gender and age on PSM levels<sup>(16–18)</sup>. Additionally, one's culture may influence how PSM is affected by age and gender. For example, Parola *et al.*<sup>(16)</sup> discovered that men tend to report higher PSM scores in Confucian Asian countries (i.e. China, Taiwan, Korea), while women tend to report higher scores in Anglo countries (i.e. United States of America, England, Australia). No gender differences were found in Germanic Europe countries (i.e. Switzerland, Flanders)<sup>(16)</sup>. However, limited research has investigated the link between Morton's SL paradigms and PSM among

American college students. The purpose of this study was to determine whether dietetic students would report a change in their PSM score following a SL course, and whether the type of SL experience (charity or project) would influence this change differently.

## Methods

### Study design

Students enrolled in six sections ( $n$  142) of the same undergraduate SL course were compared using a pretest–posttest, nonequivalent groups quasi-experimental design. The course—Applied Community Nutrition—was taught between 2016 and 2019 at a public university in northeastern United States. This course is required for, and exclusive to, dietetic students. Students must complete 14 SL hours with a community organisation and write reflection journals based on this experience. Two sections of the course held in Fall 2016 provided 'charity' SL experiences ( $n$  63), and four sections held in subsequent semesters offered 'project' SL experiences ( $n$  79). Charity experiences included those such as preparing food at a soup kitchen or sorting food donations at a food bank, while project experiences comprised those such as planning and implementing nutrition lessons at a government-funded pre-school or developing a food recovery programme in coordination with campus dining (Fig. 1). Students were unaware of which type of SL experience they would have prior to course registration. During the second week of each semester, students were given a list of six to eight pre-arranged SL options and students chose their experience on a first-come, first-serve basis. Overall, 142 students were placed at thirty different sites, with no overlap between sites providing charity (10 sites) and project (20 sites) experiences. Every course section lasted 15 weeks, was taught by the same professor and utilised the same syllabi, lectures and assignments regardless of the semester taught. All students completed the required 14 SL hours.

### Recruitment and data collection

During the first 2 weeks of the semester, students were asked to complete an anonymous pre-survey via the university's learning management system, Canvas (Instructure). The survey included questions regarding students' demography, knowledge of community nutrition concepts, motivation to engage in public service, and personal and professional behaviours. The same survey was administered during the last week of each semester. To pair students' pre- and post-data and retain anonymity, students answered the questions: 'What is the first name of your current best friend?' and 'What was the last name of your third-grade teacher?' Before beginning either survey, each student read an online consent form and indicated whether

Charity Experiences	Project Experiences
<i>Community Organization Examples</i>	
<ul style="list-style-type: none"> <li>• Community food bank</li> <li>• Food pantry</li> <li>• Healthcare coalition</li> <li>• Meals on Wheels programme</li> <li>• Soup kitchen</li> <li>• Suburban elementary school</li> <li>• Urban community schools</li> <li>• Urban garden non-profit</li> </ul>	<ul style="list-style-type: none"> <li>• Children's wellness treatment programme</li> <li>• Community farm</li> <li>• Educational non-profit</li> <li>• Head Start</li> <li>• Hospital wellness center</li> <li>• Latino health and wellness programme</li> <li>• Supermarket</li> <li>• University campus dining services</li> </ul>
<i>Project Examples</i>	
<ul style="list-style-type: none"> <li>• Bag food items</li> <li>• Develop a nutrition assessment or resource guide</li> <li>• Distribute flyers about programmes</li> <li>• Prepare, plate, and serve meals</li> <li>• Set up a garden or perform garden maintenance</li> <li>• Write a nutrition article</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct supermarket tours and food demos</li> <li>• Create nutritious, budget-friendly recipes</li> <li>• Develop and implement nutrition education lessons for various ages</li> <li>• Plan and initiate food recovery programme</li> <li>• Teach volunteers how to prepare meals for individuals who are food insecure</li> </ul>

**Fig. 1** Examples of charity and project service learning organisation partners and project activities incorporated into a community nutrition course

they permitted their survey responses to be included in the study. All students were offered a nominal amount of course credit for completing the survey (about 1 % of the course grade for each survey submitted) regardless of whether they consented to the study and allowed their answers to be included in analysis. In other words, students automatically received full points for submitting the survey no matter their answer to the consent question.

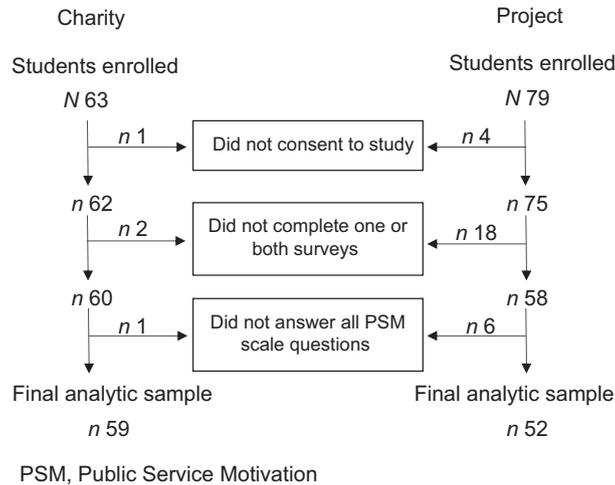
### **Demographic measures**

The survey asked students for their academic standing (i.e. freshman, sophomore, junior, senior, graduate certificate, Master's degree student), gender identity (i.e. female, male, other), and race and ethnicity (i.e. American Indian or Alaskan Native, Asian, Black or African American, Hispanic, Native Hawaiian or Pacific Islander, White, other). Students were able to select as many racial and ethnic categories as they desired. Students reported their birth

year, and the age of students enrolled in a Fall course, which began in September, was calculated by subtracting birth year from the year that the student was enrolled in the course. The age of students enrolled in a Spring semester course, which began in January, was calculated by subtracting birth year from the year before the student was enrolled in the course. Students were asked whether they ever lived in a household that received governmental food assistance (i.e. yes, no, unsure) and whether none, one or all of their parents/guardians and siblings attended or graduated college.

### **Motivation for public service**

To determine whether and how students' motivation for public service would change during the SL course, students were asked to complete Perry's PSM scale, a twenty-four-item scale is composed of four dimensions:



**Fig. 2** Flow chart of the final analytic sample of dietetic students enrolled in a community nutrition course with either charity or project service learning models

- Attraction to public policymaking (three items): excitement and self-importance one feels at the notion of formulating public policies;
- Commitment to the public interest/civic duty (five items): altruistic desire to serve the public;
- Compassion (eight items): often-emotional urge to protect the needy and
- Self-sacrifice (eight items): willingness to perform acts of service without tangible rewards<sup>(8,19)</sup>.

Each item is listed as a statement, and respondents rate their level of agreement on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). PSM score is calculated as the average of all twenty-four items, and mean scores are calculated for each dimension. The PSM scale's measures of validity include *t*-values significant at the  $P < 0.05$  level, with factor loadings ranging from 0.39 to 0.78<sup>(8)</sup>. Overall fit has been determined using goodness of fit (0.88) and adjusted goodness of fit (0.84). For reliability, alpha coefficient for the entire scale is 0.90 and alpha coefficient for the four dimensions ranges from 0.69 to 0.74 (the alpha values corresponding to each dimension have not been published)<sup>(8)</sup>. Within the present study sample, the PSM scale showed similar acceptable reliability, with a Cronbach's alpha of 0.83 for the entire scale, 0.58 for attraction to public policymaking, 0.62 for compassion, 0.71 for commitment to the public interest and 0.74 for self-sacrifice.

**Data analysis**

Responses were exported into SPSS, version 25 (IBM Corporation) for analysis. A total of 142 students were enrolled in the course, with 94.4% (*n* 134) submitting the pre-survey and 91.5% (*n* 130) submitting the post-survey. Of those who participated in the pre-survey, 99.3% (*n* 133) consented to having their data included in the study. Of those who participated in the post-survey,

96.9% (*n* 126) consented to their data being included. Any student who indicated they did not want their responses included or did not answer the consent question was removed from analysis. Additionally, students who did not complete both surveys, or who did not provide responses to the PSM scale, were removed. The final analytic sample comprised 111 students, for a response rate of 78.2% (Fig. 2). A dummy variable was created for SL type (0 = charity, 1 = project), whereby respondents enrolled in the Fall 2016 semester were categorised into the charity group (*n* 59) and respondents enrolled in subsequent semesters were categorised into the project group (*n* 52). New variables were created to provide the average score for the PSM total scale and each PSM dimension, after negatively worded items were reverse coded.

Descriptive statistics and  $\chi^2$  tests were used to compare demographic data between charity and project groups. Independent samples *t* tests were used to compare PSM total scale and dimension scores between groups at pre-survey and post-survey. Paired sample *t* tests were run to evaluate changes in PSM total scale and dimension scores over time overall and within each SL group. Finally, one-way ANCOVA was used to assess the effect of SL type on post-survey scores, controlling for pre-survey scores. SPSS was used to run all statistical analysis using a CI of 95%. Significance was determined at  $P < 0.05$ .

**Results**

The majority of the sample were female (91.9%), White (64%) and senior-level students (67.6%) who had never lived in a household receiving governmental food assistance (80.2%). Average age was 25.2 (SD 6.6) years. Most of the sample had at least one parent/guardian with a college degree (67.5%) and at least one sibling with a college degree (63.0%). No significant differences were found

**Table 1** Demographic characteristics of a sample of dietetic students (*n* 111), compared by service learning group

Characteristic	All students ( <i>n</i> 111)		Charity ( <i>n</i> 59)		Project ( <i>n</i> 52)		<i>P</i> -value*
	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	
Age (years)							0.32
Mean	25.2		24.6		25.9		
SD	6.6		6.0		7.2		
Gender							0.88
Female	91.9	102	91.5	54	92.3	48	
Male	8.1	9	8.5	5	7.7	4	
Race/Ethnicity							0.76
Asian	8.1	9	5.1	3	11.5	6	
Black or African American	3.6	4	3.4	2	3.8	2	
Hispanic	11.7	13	13.6	8	9.6	5	
White	64.0	71	64.4	38	63.5	33	
Other, including multi-race/ethnicity	12.6	14	13.6	8	11.5	6	
Academic standing							0.40
Sophomore	2.7	3	5.1	3	0.0	0	
Junior	9.0	10	8.5	5	9.6	5	
Senior	67.6	75	67.8	40	67.3	35	
Post-baccalaureate	20.7	23	18.6	11	23.1	12	
Ever lived in a household receiving governmental food assistance							0.53
No	80.2	89	79.7	47	80.8	42	
Yes	18.9	21	20.3	12	17.3	9	
Not sure	0.9	1	0.0	0	1.9	1	
Parental education level							0.31
No parents have gone to college	18.0	20	16.9	10	19.2	10	
One parent has some college education but did not graduate	12.6	14	16.9	10	7.7	4	
Both parents have some college education but did not graduate	1.8	2	3.4	2	0.0	0	
One parent has a college degree	36.0	40	30.5	18	42.3	22	
Both parents have a college degree	31.5	35	32.2	19	30.8	16	
Sibling education level							0.24
No siblings have gone to college	11.7	13	8.5	5	15.4	8	
At least one sibling has some college education but did not graduate	19.8	22	25.4	15	13.5	7	
At least one sibling has a college degree	26.1	29	30.5	18	21.2	11	
All siblings have a college degree	36.9	41	30.5	18	44.2	23	
I don't have any siblings	5.4	6	5.1	3	5.8	3	

\**P*-values when comparing characteristic by service learning group using  $\chi^2$  and Student's *t* tests (depending on variable type).

between SL groups for any demographic characteristic (Table 1).

The mean PSM total scale and dimension scores were compared between SL groups at both time points. There were no significant differences in total scale or dimension scores between charity and project groups, either at pre-survey or post-survey (Table 2). Overall, students showed a small but significant increase in their PSM total scale score between pre-survey and post-survey (3.50 *v.* 3.58;  $t(110) = 3.58$ ,  $P = 0.001$ ). Of the four PSM dimensions, all but the attraction to public policy dimension showed a small but significant increase from pre-survey to post-survey (Table 3). When analysing each SL group separately, students in the charity group exhibited a significant increase in the PSM total score from pre-survey to post-survey (3.48 *v.* 3.55;  $t(58) = 2.25$ ,  $P = 0.03$ ), but no change in any of the four component dimensions. Comparatively, students in the project group reported a significant increase in the PSM total score (3.53 *v.* 3.61;  $t(51) = 2.83$ ,  $P = 0.007$ ), as well as the commitment to public interest (3.55 *v.* 3.68;  $t(51) = 2.34$ ,  $P = 0.02$ ) and the self-sacrifice dimensions

(3.62 *v.* 3.76;  $t(51) = 3.57$ ,  $P = 0.001$ ).

Finally, one-way ANCOVA was conducted to compare the effect of SL type on post-survey scores while controlling for pre-survey score (Table 4). Levene's test and normality checks were carried out, and the assumptions met. There was a significant difference in the attraction to public policy dimension post-score ( $F(1,108) = 5.632$ ,  $P = 0.02$ ) between the two SL groups, with the charity group reporting a higher estimated marginal mean compared with the project group (3.07 *v.* 2.81, respectively), though the effect size was small (partial  $\eta^2 = 0.05$ ). Additionally, there was a significant difference in the self-sacrifice dimension post-score ( $F(1,108) = 4.062$ ,  $P = 0.046$ ), such that the estimated marginal mean of the project group was higher than the charity group (3.78 *v.* 3.67, respectively), though again the effect size was small (partial  $\eta^2 = 0.04$ ). No other dimension post-scores, nor the PSM total post-score, differed by SL type when pre-scores were held constant.

**Table 2** Comparison of mean PSM dimension and total scale scores\* between service learning groups at pre-survey and post-survey in a sample of dietetic students from a community nutrition course

PSM dimension	Pre-survey						Post-survey					
	Charity (n 59)		Project (n 52)		t-value (109)	P-value	Charity (n 59)		Project (n 52)		t-value (109)	P-value
Mean	SD	Mean	SD	Mean			SD	Mean	SD			
Attraction to public policy	2.92	0.60	2.93	0.68	-0.07	0.95	3.06	0.70	2.81	0.73	1.87	0.07
Commitment to public interest	3.57	0.43	3.55	0.51	0.18	0.86	3.64	0.53	3.68	0.58	-0.45	0.65
Compassion	3.47	0.38	3.64	0.55	-1.85†	0.07	3.56	0.45	3.72	0.52	-1.80	0.08
Self-sacrifice	3.65	0.53	3.62	0.51	0.29	0.78	3.68	0.48	3.76	0.48	-0.97	0.33
PSM total	3.48	0.32	3.53	0.38	-0.67	0.50	3.55	0.39	3.61	0.40	-0.84	0.40

PSM, public service motivation.

\*PSM scale statements scored as 1 (strongly disagree) to 5 (strongly agree).

†Levene's test indicated unequal variances ( $F=6.07$ ,  $P=0.02$ ), so degrees of freedom were adjusted from 109 to 88.

## Discussion

The objectives of this study were to determine (1) whether dietetic students would report a change in PSM scores following an SL community nutrition course, and (2) whether the type of SL experience would lead to differential changes. With regard to the first objective, students expressed a slight motivation for public service at the beginning of the semester and showed a statistically significant increase in PSM score by the end of the course, regardless of SL type. However, this increase was small (0.08 points), and it is unknown whether this is a meaningful change as few prior studies exist. In one study of sixteen nursing students who engaged in nutrition-based SL experiences, Tanner and Brown<sup>(20)</sup> found no change in PSM scores. Unfortunately, the researchers utilised a six-point, rather than a five-point Likert scale and did not report average PSM scores, so it was impossible to directly compare these findings.

Other studies of non-nutrition SL courses have found small but significant changes in PSM over time. For example, when compared with a control group, students enrolled in a social justice-oriented SL programme reported significantly higher increases in an abbreviated PSM by the end of the programme<sup>(21)</sup>. Although statistically significant, the rise in the average PSM score was small (0.30 points), which the researchers attribute to the short, one-year programme duration<sup>(21)</sup>. Likewise, a pair of concurrent SL courses at the University of North Florida was created to teach engineering and physical therapy students the process of designing, constructing and evaluating rehabilitation technology for children with disabilities<sup>(22,23)</sup>. Lundy *et al.*<sup>(22,23)</sup> found a significant increase in PSM at the conclusion of the semester, though again the change was small (0.20 points). Thus, it may be that increases in PSM scores rise concomitantly with the number of hours spent in SL experiences and that more than one semester or year is necessary to bring about more meaningful change. Interestingly, when Lundy *et al.*'s data were analysed by

discipline, only engineering students were noted to have significantly increased PSM levels<sup>(22,23)</sup>. The researchers postulate that because the work of physical therapists is already service-oriented, the physical therapy students benefitted more from the technical experience of working with engineering students rather than the service element<sup>(22)</sup>. Given that the work of registered dietitian nutritionists (RDN) is also service-oriented, it may be unreasonable to expect dramatic changes in PSM scores, even with increased exposure to SL experiences. Additional research is needed to explore whether there is a dose-response effect, and whether this effect differs by discipline.

When looking at the PSM dimensions among the entire sample, students reported small but significant increases (0.08–0.10 points) in their commitment to public interest, compassion and self-sacrifice, and no change in their attraction to public policy. It would appear that reading and discussing socially-oriented topics such as community assessment, programme planning, healthcare, cultural competence and food security, along with completing 14 SL hours, shifted students' motives in these three dimensions. Similarly, Lundy *et al.*<sup>(22,23)</sup> found that their interdisciplinary rehabilitation technology SL course increased all students' commitment to public interest, whereas only engineering students reported an increase in compassion. Unfortunately, the researchers do not attempt to explain these results<sup>(22,23)</sup>. Interestingly, despite also covering public policy and policymaking in the community nutrition course, the sample scored lowest in the attraction to public policy dimension at both pre- and post-surveys and showed no significant change over time. It is possible that the low scores are related to the divisive political climate during the intervention period, which occurred during the Trump administration (2016–2020). In fact, Ward<sup>(24)</sup> noted the 2000 presidential election was a potential confounding variable that influenced voting behaviours and political interests and may have affected the attraction to public policy among their sample of AmeriCorps

**Table 3** Comparison between mean public service motivation (PSM) dimension and total scale scores\* between pre- and post-surveys for all students, and by service learning type, in a sample of dietetic students from a community nutrition course

PSM dimension	Total						Charity						Project					
	Pre-survey (n 111)		Post-survey (n 111)		t-value (110)	P-value	Pre-survey (n 59)		Post-survey (n 59)		t-value (58)	P-value	Pre-survey (n 52)		Post-survey (n 52)		t-value (51)	P-value
	Mean	SD	Mean	SD			Mean	SD	Mean	SD			Mean	SD	Mean	SD		
Attraction to public policy	2.92	0.64	2.94	0.72	-0.31	0.76	2.92	0.60	3.06	0.70	-1.82	0.08	2.93	0.68	2.81	0.73	1.40	0.17
Commitment to public interest	3.56	0.47	3.66	0.55	-2.58	0.01	3.57	0.43	3.64	0.53	-1.33	0.19	3.55	0.51	3.68	0.58	-2.34	0.02
Compassion	3.55	0.47	3.64	0.49	-2.75	0.007	3.47	0.38	3.56	0.45	-1.95	0.06	3.64	0.55	3.72	0.52	-1.93	0.06
Self-sacrifice	3.64	0.51	3.72	0.48	-2.73	0.007	3.65	0.53	3.68	0.48	-0.64	0.53	3.62	0.51	3.76	0.48	-3.57	0.001
PSM total	3.50	0.35	3.58	0.39	-3.58	0.001	3.48	0.32	3.55	0.39	-2.25	0.03	3.53	0.38	3.61	0.40	-2.83	0.007

\*PSM scale statements scored as 1 (strongly disagree) to 5 (strongly agree).

participants. Similarly, it can be speculated that the polarising effect of the 2016 presidential election and subsequent 4 years contributed to the dietetic students' low scores in attraction to public policy at both time points. Still, it should be noted that the attraction to public policy dimension has been criticised for its low internal validity, as well as the fact that it is based on American service values and therefore cannot be used in other cultures without modification<sup>(25–28)</sup>. Because of these limitations, several researchers have suggested using items other than those in Perry's PSM scale to measure one's attraction to politics and policymaking<sup>(25–30)</sup>.

Regarding the second objective, SL experience type did not predict PSM total scale post-scores when pre-scores were controlled, though students showed differing changes in PSM dimension scores depending on the type of SL experience assigned. Unfortunately, other studies comparing PSM scores between different types of SL experiences could not be located. As previously mentioned, it may be that 14 h of SL is not enough to detect a significant difference in PSM scores between those engaged in charity *v.* project experiences. However, it is important to note that PSM-related variables have been shown to exhibit high stability over time, suggesting the possibility that PSM is a stable trait rather than a dynamic one<sup>(28)</sup>. Alternatively, it may be that while any SL experience leads to an increase in PSM total score over time, the type of SL experience affects the component dimensions differently, such that some dimensions are higher among one SL type *v.* another yet when averaged together lead to similar overall scores regardless of the amount of time spent in SL activities. Further research is needed to elucidate this finding.

Among the sample, the charity group showed higher scores in attraction to public policy by the end of the semester, while the project group scored higher in the self-sacrifice dimension. Regarding attraction to public policy, Morton<sup>(6)</sup> explains that the main problems in project-based service are balancing the goals of the programme with the limited available resources. Therefore, it is possible that students in the project group had more exposure to the flawed politics or underlying causes of injustice leading to the need for service organisations and accordingly experienced reduced attraction to public policy compared with students in the charity group. Regarding self-sacrifice, Morton<sup>(6)</sup> recalls his interview with the director of a homeless shelter, who mentioned that although he still believed charity-based service to be beneficial, he felt worn down after serving so many people without seeing tangible results. It may be that the students in the charity group shared this sentiment and therefore were less likely to report self-sacrifice tendencies. Specifically, many of the charity-based experiences could have been completed by any volunteer, regardless of their level of nutrition knowledge. Conversely, project-based experiences required both the presence and application of dietetics-related concepts—food composition, nutrition education techniques,

**Table 4** ANCOVA results for post-survey public service motivation (PSM) dimension and total scale scores\* by service learning group, controlling for pre-survey scores in a sample of dietetic students from a community nutrition course

PSM dimension	Post-score adjusted mean				F value (1108)	P-value	$\eta_p^2$	R <sup>2</sup>
	Charity		Project					
	Mean	SEM†	Mean	SEM†				
Attraction to public policy	3.07	0.08	2.81	0.08	5.63	0.02	0.05	0.38
Commitment to public interest	3.63	0.05	3.69	0.06	0.62	0.43	0.006	0.47
Compassion	3.62	0.04	3.65	0.04	0.29	0.59	0.003	0.59
Self-sacrifice	3.67	0.04	3.78	0.04	4.06	0.046	0.04	0.65
PSM total scale	3.57	0.03	3.59	0.03	0.25	0.62	0.002	0.65

\*PSM scale statements scored as 1 (strongly disagree) to 5 (strongly agree).

†Post-score adjusted mean and SEM adjusted for dimension pre-score mean.

evaluation methods, etc.—in order to teach community members or create programmes. Students who felt their contribution was unique or dependent upon their knowledge and skills may have been more likely to experience intangible rewards like pride and accomplishment, compared with their peers in the charity group who may have felt their role was generic and thus require more tangible benefits to continue. Further research is needed to test these hypotheses and gain a better understanding of why different types of SL experiences elicit change in one PSM dimension over another.

These findings should be interpreted within the study's limitations. First, the sample was drawn from a single course at one university, albeit over several semesters. It is not known whether the dietetic students in the sample differ from those at other universities, or how they compare students in other healthcare fields or non-health majors. Thus, these results may not be generalisable to all university students, or even all dietetic students. It should also be noted that both the course and the SL opportunities were offered in a face-to-face modality. However, with the growth of online instruction and pivot to digital interactions due to the COVID-19 pandemic, more research is needed to identify updated and flexible SL models and evaluate the role that remote SL opportunities have on PSM. Additionally, while the two groups that were compared varied by SL type, a control group of similar students enrolled in a non-SL course was not included. Had a control group been available, more dramatic differences in PSM scores may have been observed between SL and non-SL students. Last, while potential confounders such as course instructor, lectures, assignments and university setting were controlled for, there are other factors could not be held constant. For example, studies indicate that PSM varies with age, gender, personality, religiosity and religious socialisation, spirituality, family socialisation, experiencing family poverty and employment type<sup>(12–18,21–23,31,32)</sup>. Unfortunately, there was not enough variation in the sample to analyse differences by age, gender and food

assistance, nor were we able to control for prior or concurrent volunteer experience that may have affected responses to the PSM scale.

## Conclusions

Despite these limitations, the current findings suggest that an SL course in community nutrition can positively affect dietetic students' motivation for public service. This is important given the increased need and demand for community-based RDN resulting from growing healthcare costs, burden of diet-related chronic diseases and emphasis on preventative care<sup>(33)</sup>. Yet nationally, the percentage of RDN working in community nutrition has been declining (9 % in 2019<sup>(34)</sup>, down from 11 % in 2002<sup>(35)</sup>), while the majority of RDN work in clinical nutrition with growing frequency (61 % in 2019<sup>(34)</sup>, up from 54 % in 2002<sup>(35)</sup>). One estimate from 2015 indicates the need for a 113 % increase in the public health nutritionist workforce to meet recommended staffing ratios<sup>(33)</sup>. Due to these trends, dietetic students may lack familiarity with, exposure to and interest in the types of professional roles they can play within communities. Dietetic educators should consider adopting pedagogical methods like SL into curricular offerings to enhance students' motivation for public service and understanding of community-based roles for RDN. In doing so, future students may be more willing to pursue career paths in community nutrition and help fill the growing need for competent practitioners.

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## References

- Yardley S, Teunissen PW & Dornan T (2012) Experiential learning: transforming theory into practice. *Med Teach* **34**, 161–164.
- Furco A (1996) Service-learning: a balanced approach to experiential education. *Serv Learn Gen* **128**, 2–6.
- Celio CI, Durlak J & Dymnicki A (2011) A meta-analysis of the impact of service-learning on students. *J Exp Educ* **34**, 164–181.
- Holsapple MA (2012) Service-learning and student diversity outcomes: existing evidence and directions for future research. *Mich J Community Serv Learn* **18**, 5–18.
- Warren JL (2012) Does service-learning increase student learning? A meta-analysis. *Mich J Community Serv Learn* **18**, 56–61.
- Morton K (1995) The irony of service: Charity, project and social change in service-learning. *Mich J Community Serv Learn* **2**, 19–32.
- Parker-Gwin R & Mabry JB (1998) Service learning as pedagogy and civic education: comparing outcomes for three models. *Teach Sociol* **26**, 276–91.
- Perry JL (1996) Measuring public service motivation: an assessment of construct reliability and validity. *J Public Adm Res Theor* **6**, 5–22.
- Naff KC & Crum J (1999) Working for America: does public service motivation make a difference? *Rev Public Pers Adm* **19**, 5–16.
- Homberg F, McCarthy D & Tabvuma V (2015) A meta-analysis of the relationship between public service motivation and job satisfaction. *Public Adm Rev* **75**, 711–722.
- Miao Q, Newman A, Schwarz G *et al.* (2018) How leadership and public service motivation enhance innovative behavior. *Public Adm Rev* **78**, 71–81.
- DeHart-Davis L, Marlowe J & Pandey SK (2006) Gender dimensions of public service motivation. *Public Adm Rev* **66**, 873–887.
- Yudiatmaja WE (2017) Public service motivation differences between permanent and contract employees in the local government. *Mimb J Sos Dan Pambang* **33**, 329–340.
- Perry JL (1997) Antecedents of public service motivation. *J Public Adm Res Theory* **7**, 181–197.
- Ritz A, Brewer GA & Neumann O (2016) Public service motivation: a systematic literature review and outlook. *Public Adm Rev* **76**, 414–426.
- Parola HR, Harai MB, Herst DE *et al.* (2019) Demographic determinants of public service motivation: a meta-analysis of PSM-age and -gender relationships. *Public Manag Rev* **21**, 1397–1419.
- Kjeldsen AM & Jacobsen CB (2013) Public service motivation and employment sector: Attraction or socialization? *J Public Adm Res Theor* **23**, 899–926.
- Andersen LB, Pallesen T & Holm Pedersen L (2011) Does ownership matter? Public service motivation among physiotherapists in the private and public sectors in Denmark. *Rev Public Pers Adm* **31**, 10–27.
- Bringle RG, Phillips MA & Hudson M (2004) *The Measure of Service Learning: Research Scales to Assess Student Experiences*. Washington, DC: American Psychological Association.
- Tanner ME & Brown CL (2013) Infusing service-learning into academic ABCs: awareness, behavior, and community collaboration. *PRISM: J Reg Engagement* **2**, 71–84.
- Seider SC, Rabinowicz SA & Gillmor SC (2011) The impact of philosophy and theology service-learning experiences upon the public service motivation of participating college students. *J High Educ* **82**, 597–628.
- Lundy M, Rodriguez A & Aceros J (2018) Engineering, physical therapy and the community: A service learning course. In *2018 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, pp. 1640–1643. Honolulu, HI: Institute of Electrical and Electronics Engineers.
- Lundy M & Aceros J (2016) A community-based, interdisciplinary rehabilitation engineering course. In *2016 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, pp. 3006–3009. Orlando, Florida: Institute of Electrical and Electronics Engineers.
- Ward KD (2014) Cultivating public service motivation through AmeriCorps service: a longitudinal study. *Public Adm Rev* **74**, 114.
- Giauque D, Ritz A, Varone F *et al.* (2011) Putting public service motivation into context: a balance between universalism and particularism. *Int Rev Adm Sci* **77**, 227–253.
- Kim S (2009) Testing the structure of public service motivation in Korea: A research note. *J Public Adm Res Theor* **19**, 839–851.
- Kim S (2008) Revising Perry's measurement scale of public service motivation. *Am Rev Public Adm* **39**, 149–163.
- Vogel D & Kroll A (2015) The stability and change of PSM-related values across time: Testing theoretical expectations against panel data. *Int Public Manag J* **92**, 53–77.
- Ritz A (2011) Attraction to public policy-making: a qualitative inquiry into improvements in PSM measurement. *Public Adm* **89**, 1128–1147.
- Vandenabeele W (2008) Development of a public service motivation measurement scale: corroborating and extending Perry's measurement instrument. *Int Public Manag J* **11**, 143–167.
- Jang C-L (2012) The effect of personality traits on public service motivation: evidence from Taiwan. *Soc Behav Personal Int J* **40**, 725–733.
- Camilleri E (2007) Antecedents affecting public service motivation. *Pers Rev* **36**, 356–377.
- Bruening M, Udarbe AZ, Jimenez EY *et al.* (2015) Academy of Nutrition and Dietetics: Standards of practice and standards of professional performance for registered dietitian nutritionists (competent, proficient, and expert) in public health and community nutrition. *J Acad Nutr Diet* **115**, 1699–1709.e39.
- Academy of Nutrition and Dietetics (2020) *Compensation & Benefits Survey of the Dietetics Profession 2019*. Chicago, IL: Academy of Nutrition and Dietetics.
- Rogers D & Salary Survey Work Group (2003) Report on the ADA 2002 dietetics compensation and benefits survey. *J Am Diet Assoc* **103**, 243–255.