

## INSTRUCTIONAL DESIGN AND ASSESSMENT

# Impact of a Service-Learning Course on First-Year Pharmacy Students' Learning Outcomes

Kevin R. Kearney, PhD

School of Pharmacy-Worcester/Manchester, MCPHS University, Worcester, MA

Submitted August 10, 2012; accepted October 8, 2012; published March 12, 2013.

**Objectives.** To assess the differences in learning outcomes of first-year (P1) pharmacy students enrolled in a course based on service learning with those of a comparable group of students not enrolled in a course involving service learning.

**Design.** Students on 2 campuses of a school of pharmacy completed a required P1 course involving service learning. A control group of students at a different school completed typical P1 courses, none of which involved service learning.

**Assessment.** A questionnaire was administered to P1 students in the study group at the conclusion of the service-learning course, and a similar questionnaire was administered to P1 students in the control group in the spring of their P1 year. Survey questions inquired about what the students had learned generally and in the areas identified as common to the 2 groups of respondents. Differences in the learning outcomes of the students were identified, most notably in the areas of professional communication, cultural competence, the elderly, and awareness of service-providing agencies in the community.

**Conclusion.** This study demonstrated that service-learning positively impacts pharmacy students' learning outcomes.

**Keywords:** service-learning, educational outcomes, learning objectives, pharmacy students

## INTRODUCTION

Many articles in the literature describe courses that use service-learning methods, including several related to pharmacy education.<sup>1-11</sup> Many of these studies investigated learning outcomes using assessment methods such as pre- and post-course testing or post-course open-ended questions and responses. These studies, however, did not address whether the service-learning courses led to learning outcomes different from those that can be achieved by students taking similar courses that do not involve service learning.

Learning outcomes from an earlier offering of this service-learning course were studied by comparing the results of pre- and post-course surveys.<sup>12</sup> A follow-up article describes a subsequent offering of the course, in which open-ended questions were posed to the students to determine what they could articulate regarding what they had learned about a variety of topics addressed in the course.<sup>7</sup> In this article, we compared the learning outcomes of students engaged in service learning with those

of a control group. The current study assessed pharmacy-related knowledge of first-year students in 2 schools of pharmacy with similar curricula, 1 that included a required course involving service learning and 1 that did not. Except for this difference, the curricula in the 2 schools were similar.

## DESIGN

In the first semester of the first year of the curriculum at the MCPHS University School of Pharmacy-Worcester/Manchester, all students are required to enroll in a 1-credit course entitled Service-Learning. The same course, following a common syllabus and schedule, is taught at the Worcester, Massachusetts, and Manchester, New Hampshire, campuses by instructors who work closely to coordinate their efforts. In fall 2009, there were 196 students in 6 sections of the course at the Worcester campus and 2 sections at the Manchester campus. For the present study, the study group was made up of Worcester and Manchester campus students, and the control group was comprised of P1 students at another school of pharmacy where service learning was not included in the curriculum.

The objectives of the service-learning course are shown in Table 1. As part of the course, students were

**Corresponding Author:** Kevin R. Kearney, PhD, MCPHS University, 19 Foster Street, Worcester, MA 01608.  
Tel: 508-373-5605. Fax: 508-890-5618. E-mail: kevin.kearney@mcphe.edu

required to provide at least 2 hours of service per week for 10 weeks at their assigned service site and to participate in 1-hour weekly seminars. Table 2 lists the types of service sites. For the first part of the semester, topics of discussion during the weekly seminars included learning by reflecting on service, communication skills, the diversity of cultures, and assessing the quality of service. For the last 5 weeks of the semester, students gave in-class presentations about the work they were doing and what they were learning from their experiences. A detailed description of the course was provided previously.<sup>7</sup>

The design of the study was reviewed and approved by expedited review by the college's Institutional Review Board.

## ASSESSMENT

To gather general information about the students in the Worcester and Manchester groups (age, sex, previous community service experience, prior service-learning courses, and the name of the organizations with which they did their service work for the course) and to assess what they could articulate about topics covered in the course, a questionnaire was administered to students on the last day of the course in fall 2009 (Table 3). All students were required to complete the questionnaire. They did not provide their names on the forms, but they were asked to indicate on the form whether the information they provided could be used in the study. Copies of the survey instrument and cover sheet are available from the author. Someone other than the study director administered the survey instruments.

A similar questionnaire was administered to students in the control group in the spring of their P1 year. The students, who were enrolled at another pharmacy school

in a required course that did not include service learning, were asked but not required to complete the questionnaire. The information provided to students on the cover sheet, and the background and content questions posed to them in the questionnaire were the same as those presented to the Worcester and Manchester groups, except for slight modifications (Table 3).

Of the 196 students in the Worcester group, 194 (99.0%) gave permission for their questionnaire responses to be used in this study. All 55 members of the Manchester group gave permission for their answers to be used. Forty-seven (78.3%) of the 60 students in the control group completed the questionnaire. Information about the respondents' age, sex, previous community service experience, prior experience with service-learning courses, and the organizations with which they worked was compiled in an Microsoft Excel spreadsheet. The demographic profiles (sex and age) of the various groups are shown in Table 4, and the service organization profile is presented in Table 2.

All of the completed questionnaires from the Manchester and control campuses were analyzed. Because of the large number of students at the Worcester campus relative to the number of students at the other campuses, only a subset of approximately 55% of these survey instruments (N=106), selected at random, were analyzed. The demographic and service organization profiles of the Worcester detailed-analysis subset were similar to those of the entire sample, indicating that it was a representative subset (Tables 2 and 4).

While the demographics of the student populations at the Worcester and Manchester campuses were similar, the demographics of the control group were somewhat different (Table 4). Three-quarters of the Worcester and

Table 1. Learning Objectives of a Required Course Involving Service Learning for First-Year Pharmacy Students

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Provide concrete service, competently and professionally, to individuals and to the institution, organization or agency where the service is rendered. By doing this and reflecting on it, by the conclusion of the course, students should be able to articulate what it means to care for others and should have an appreciation of the value of community engagement and working to improve society.
By the conclusion of the course, students should be able to describe the key issues facing the elderly (especially with regard to their physical and mental health), children (especially with regard to education, safety, and physical and mental health), the homeless, and those living "on the fringes" in our community (especially with regard to housing, nutrition, and physical and mental health).
By the conclusion of the course, students should be able to articulate criteria for evaluating the quality of service.
Through the service work and participation in the classroom, develop/improve one's oral communication skills. By the conclusion of the course, students should be able to articulate essential communication skills and should have demonstrated good communication skills at their service-learning workplaces.
Develop presentation skills by preparing and giving a presentation on the lessons learned from one's service-learning work. By the conclusion of the course, students should have given a presentation that meets course requirements.
By the conclusion of the course, students should be able to articulate the most common healthcare and social service needs of the local community and to identify organizations that provide services to meet those needs.
By the conclusion of the course, students should be able to articulate the common beliefs and practices of the major cultural groups with whom they and their classmates have worked as part of the course and those discussed in the seminar part of the course.

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Table 2. Types of Worksites at Which First-Year Pharmacy Students Who Participated in the Study Completed a Community Service Experience

Type of Work Site	Worcester <sup>a</sup>	Manchester
Nursing home, assisted-living facility, adult day health center, senior center	9	13
Public schools	23	7
Nonschool organizations serving children	22	20
Mental health service organization	7	4
Other healthcare organization	5	0
Immigrant services organization	7	4
Social services	32	7
None indicated	1	0

<sup>a</sup> Because the number of participating students at the Worcester campus (n=194) was significantly larger than that at the Manchester campus (n=55), only a random sample (n=106) of the questionnaires completed by Worcester students during the assessment portion of the study was used in the statistical analysis.

Manchester students, who were enrolled in a transfer-in program, were age 22 to 27 years, whereas 85% of the control group, who were enrolled in a traditional 6-year program, were 19 to 21 years old.

Table 3. Items on Questionnaire Administered to First-Year Pharmacy Students

Did you do any community service while you were in college?
Did you take any course(s) involving service learning while you were in college?
Describe 3 elements of effective communication, [which were discussed in this course and] which you are trying to practice in your own life.
Describe 3 concrete things [that you learned in this course] about people and practices from cultures other than your own, which healthcare providers should know.
[Based on what you learned from your own or your classmates' service-learning experiences,] describe 3 concrete things that are important to understand, in order to be able to provide the best possible care to senior citizens.
[Based on what you learned from your own or your classmates' service-learning experiences,] describe 3 factors that lead to homelessness.
Identify and describe 3 organizations in the local community and the healthcare or social services they provide for children, adolescents, elders, or other low-income populations.

Note: Bracketed words were omitted from the questions administered to students without service-learning coursework (ie, control group).

Table 4. Demographics of First-Year Pharmacy Students Who Completed the Survey Instrument

	Worcester <sup>a</sup>	Manchester	Control
No. of respondents	106	55	47
Female, %	58	64	55
Male, %	42	36	45
Age in years, %			
19-21	5	4	85
22-24	50	46	9
25-27	28	30	2
28-30	11	11	2
Over 30	7	9	2

<sup>a</sup> Because the number of participating students at the Worcester campus (n=194) was significantly larger than that at the Manchester campus (n=55), only a random sample (n=106) of the questionnaires completed by Worcester students during the assessment portion of the study was used in the statistical analysis.

A detailed analysis of the respondents' answers to the open-ended questions was conducted. Each answer to an open-ended content question on the selected questionnaires was evaluated and assigned a grade on a scale of 0 to 3. Table 5 shows the assessment rubric for rating the answers. Table 6 shows information about the survey respondents' prior experiences with community service and service-learning courses. While few students in any of the groups reported having previously taken any courses involving service-learning, a majority in each group reported previous community service experience: 80% of the Worcester group, 70% of the Manchester group, and 51% of the control group. The difference between the former 2 groups and the last group may reflect the age difference between the populations.

Because the means from the Worcester and Manchester groups were similar and because they represented populations enrolled in identical courses, the data were compared by conducting a *t* test (2-tailed, unequal variance). The results of the *t* tests indicate that the data sets were not significantly different ( $p > 0.05$ ). Because of the similarity, the 2 Worcester and Manchester groups were merged (combined study group, N=161) for comparison with the control group. Data from the combined study group and the control group were compared by *t* tests.

The first content question posed to the students asked them to describe 3 elements of effective communication. Respondents mentioned behaviors such as active listening (ie, paraphrasing what one heard to ensure understanding), making eye contact, using appropriate body language, and speaking at an appropriate language (literacy) level. The mean grades of the combined study group ( $2.6 \pm 0.7$ ) and the control group ( $2.0 \pm 0.9$ ) were significantly different ( $p < 0.001$ ).

Table 5. Rubric for Assessment of Open-Ended Survey Questions<sup>a</sup> Administered to First-Year Pharmacy Students

Question	0.5 points	1.0 points
Describe 3 elements of effective communication, [which were discussed in this course and] which you are trying to practice in your own life.	One vague element of communication	One specific element
Describe 3 concrete things [that you learned in this course] about people and practices from cultures other than your own, which healthcare providers should know.	One item, vaguely described (culture)	One item, clearly and accurately described
[Based on what you learned from your own or your classmates' service-learning experiences] describe 3 concrete things that are important to understand, in order to be able to provide the best possible care to senior citizens.	One item, vaguely described (senior citizens)	One item, clearly and accurately described
[Based on what you learned from your own or your classmates' service-learning experiences] describe 3 factors that lead to homelessness.	One factor (homelessness), vaguely described	One factor, clearly and accurately described
Identify and describe 3 organizations in the local community and the healthcare or social services they provide for children, adolescents, elders, or other low-income populations.	One specific organization but no description of services, or a generic reference to a type of organization or service	One organization, with an accurate description of services it provides

<sup>a</sup> Based on this rubric, each answer was rated by adding the number of points earned. The maximum number of points that could be earned for each question was 3.0.

In the second content question, the students were asked to “describe 3 concrete things . . . about people and cultures other than [their] own.” Some of the most common responses were: culturally appropriate nonverbal communication (eg, making eye contact or not), understanding the expected involvement of family members when speaking with an individual, use of herbal or complementary and alternative medicines, expected roles of men and women, culturally specific dietary practices, and

the impact of religious beliefs on healthcare practices. The mean grades of the combined study group ( $1.7 \pm 1.2$ ) and the control group ( $1.0 \pm 1.1$ ) were significantly different ( $p < 0.001$ ).

The third content question asked the students to “describe 3 concrete things that are important to understand in order to be able to provide the best possible care to senior citizens.” Responses of the students included: the importance of patience in dealing with the elderly, listening carefully, showing respect, speaking slowly and sufficiently loudly (without going to extremes), knowing that loneliness is a common issue for the elderly, and not stereotyping. The mean grades of the combined study group ( $2.1 \pm 1.0$ ) and the control group ( $0.9 \pm 0.9$ ) were significantly different ( $p < 0.001$ ).

In the fourth content question, the students were asked to describe 3 factors that lead to homelessness. The most commonly articulated factors were substance abuse, job loss (in a poor economy), inadequate education and training, family break-up, and mental illness. The mean grades of the combined study group ( $2.3 \pm 0.9$ ) and the control group ( $2.4 \pm 0.7$ ) were not significantly different ( $p = 0.37$ ). The final content question asked the students to describe 3 service-providing organizations in the local community. The mean grades of the combined study group ( $2.6 \pm 0.8$ ) and the control group ( $1.2 \pm 1.0$ ) were significantly different ( $p < 0.001$ ).

Table 6. Percentage of Survey Respondents With Previous Community Service and Service-Learning Experiences

	Percent of Students	
	Worcester + Manchester, <sup>a</sup> N=161	Control, N=47
Previous community service		
Never	23	49
1 or more per year	77	51
Previous service-learning course		
Never	81	89
1 or more	19	11

<sup>a</sup> Because the number of participating students at the Worcester campus (n=194) was significantly larger than that at the Manchester campus (n=55), only a random sample (n=106) of the questionnaires completed by Worcester students during the assessment portion of the study was used in the statistical analysis.

## DISCUSSION

One limitation of many studies of service learning is that they cannot determine whether service learning adds anything to students' learning outcomes beyond what can be achieved with other teaching methods or courses. This study addressed that issue. A written questionnaire that included open-ended questions was used to assess the knowledge of 2 groups of students, 1 of which was in a program whose curriculum included a course based in service learning and the other in a similar program without a service-learning course. The 5 different knowledge areas assessed in both groups related to topics covered in the P1 year of the pharmacy curriculum. In 4 of the 5 areas, the students who had completed the service-learning course demonstrated knowledge superior to that of the control group.

The Worcester and Manchester students were better able to articulate elements of effective communication than were students in the control group. As part of the service-learning course they took, the students in the study group discussed communications in 1 of the weekly seminars and were asked to focus on developing their communication skills during their community work. In their presentations about their work, many spoke about developing communication skills, suggesting that the combination of talking about and consciously exercising communication skills resulted in a superior ability to articulate some of the elements of effective communication.

All students' grades for their descriptions of important-to-know information regarding cultures other than their own were relatively low, but the study group students' answers merited higher average grades than did those of the control group. During 1 of the seminars in the service-learning course, the study group students, who were a diverse group, were able to discuss cultural differences by drawing on their personal experiences. The students were also asked to be attentive to the cultural diversity among people with whom they worked in their community service sites, with goal being to learn about cultures other than their own that were represented in the community. Many students talked about this experience in their presentations about their work. The higher mean grade of students in the study group compared with the that of students in the control group suggests that students in the study group learned more as a result of engaging in work during the course that allowed them to learn from their experiences, as well as in shared teaching and learning in the classroom. The relatively low mean grade of students in the study group, however, also highlights this component as a possible aspect of the course to be improved.

Given that the elderly, as a group, will comprise a large percentage of the pharmacy students' future patients,

knowledge about this population is important. While many courses in pharmacy colleges and schools address this topic, many of the students in the service-learning course actually worked with seniors as part of their community experience. The study group students earned a significantly higher mean grade on their answers to the item asking them to describe what aspects of providing care for senior citizens are important to understand, suggesting the service-learning experiences and/or presentations about these experiences, combined with classroom teaching, resulted in a superior ability to articulate knowledge about the elderly and their needs.

The next question in the survey instrument asked the students to describe what they had learned about factors leading to homelessness. In their answers to this item, the mean grade of the study group students was no different from that of the control group. Possible explanations for the lack of a difference are that few students in the study group were actually working with the homeless population, that the topic of homelessness and its causes was not explicitly addressed in the service-learning course, that other courses address this issue, and/or that students in both the study group and the control group had acquired information about the topic from other sources. Irrespective of the reason, the responses to this question suggest that this service-learning course did not contribute significantly to the students' understanding of homelessness.

The last item on the questionnaire asked the students to identify and describe organizations in the community that provide healthcare or social services to various populations. This was the item on which there was the greatest difference in responses between the students in the study group and those in the control group, with the former earning a significantly higher grade. The higher grades of the study group students on this item were most likely attributable to their active engagement in various community organizations as part of the service-learning course and exposure to their classmates' presentations about their work in other organizations. A desirable outcome of these students' experiences and the resulting knowledge would be for them to ultimately become pharmacists with a superior level of community awareness.

The 4 areas in which the service-learning course seemed to add significantly to the students' learning have been identified by the Accreditation Council for Pharmacy Education (ACPE) as important for pharmacy students. In the ACPE's Accreditation Standards and Guidelines for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree<sup>13</sup> (Standards), communication and cultural competence are highlighted as important skills for pharmacy students. The Standards also emphasize the need for pharmacy students to learn

patient-specific care, part of which is learning about senior citizens and their needs. Finally, the Standards state that pharmacy students need to learn to function as members of interprofessional teams, which requires developing an awareness of the care-providing professionals and organizations in a typical community.

One limitation of this study is that we could not determine how much of the knowledge the study group students acquired from the service-learning course, considering that they probably learned some of what they reported in their responses to survey items from other courses they took simultaneously or had taken previously. By comparing their knowledge to that of a similar cohort (ie, other P1 pharmacy students who were taking similar courses without a service-learning component), it is nonetheless possible to get a sense of the differential learning that can be attributed to service learning.

A related limitation of this study is that it is difficult to ascertain whether the material covered in and the learning objectives of the classroom courses taken by the study and control groups were exactly the same. A review of the course objectives of the Introductory Professional Practice and HealthCare Delivery courses in the 2 curricula revealed similarities, but because many of the objectives are broad, some differences may not be evident. In at least 1 area, there is a clear similarity: the development of communication skills is explicitly indicated as an objective in 1 or more courses or prerequisite courses in the curricula of both groups. In other areas, similarities are not as clear. For example, although the healthcare delivery courses in both programs cover Medicare, which relates to the care of senior citizens, the elderly are not explicitly mentioned in the objectives of either program's relevant courses. The absence of explicit overlap in objectives is a limitation of this study; however, because both programs meet ACPE accreditation standards and the P1 courses in both programs are similar in general focus, a reasonable assumption is that students in both groups were exposed to similar if not identical content.

Another possible explanation for part of the knowledge difference between the 2 groups is that the typical age of students in the study group was several years older than that of students in the control group. The study group's previous life experience and, for some, their having taken more academic courses before coming to pharmacy school, may have increased their knowledge level. However, this alone probably would not account for the knowledge differences in the areas probed in the questionnaire, most of which were specifically addressed in the P1 pharmacy curriculum. The 1 area in which there was not a significant difference in knowledge levels between the

2 groups (ie, factors leading to homelessness) was an area not specifically addressed in the curriculum; thus, the item related to homelessness could be considered a control question, demonstrating similar knowledge levels in areas not impacted by the curriculum.

## CONCLUSION

By comparing the knowledge levels of 2 groups of P1 pharmacy students, both of which were taking or had taken similar courses but only 1 of which had taken a course involving service learning, this study demonstrated the positive differential impact of service learning. The pharmacy students who had engaged in community service and structured reflection on that service learned more in areas important for pharmacy education than did the students who did not have these experiences.

## ACKNOWLEDGMENTS

The author acknowledges and thanks Dr. Monina Lahoz for reading a draft of this manuscript and providing suggestions for improvement.

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