January 2000

Service-learning as a tool for enhancing student outcomes in a college-level lecture course

Amy Strage
San Jose State University, amy.strage@sjsu.edu

Recommended Citation

Amy Strage. "Service-learning as a tool for enhancing student outcomes in a college-level lecture course" *Michigan Journal of Community Service Learning* (2000): 5-13.

Service-Learning: Enhancing Student Learning Outcomes in a College-Level Lecture Course

Amy A. Strage
San Jose State University

This article reports on the effects of infusing a 20-hour per semester service-learning requirement into a large Introductory Child Development course. Analyses of student outcomes on course assignments revealed that the 166 students in the service-learning cohorts (2 classes) out-performed the 309 students who took the course during the three semesters prior to the introduction of the service-learning requirement. The advantage for the service-learning students appeared to stem primarily from stronger performance on narrative assessments (midterm and take-home final essays), and appeared to manifest itself only later in the semester. Analyses of students' journals confirmed that students reflected thoughtfully about links between what they were learning in lecture and from course readings, and the hands-on experiences they were having at their service-learning placements. Discussion focuses on the parameters that appear to delimit the academic advantages of service-learning.

During the past decade, there has been a marked increase in interest in the pedagogy of service-learning. Perturbed by a lack of civic engagement on college campuses, frustrated by the ubiquitous "information-assimilation" style of teaching and learning (Coleman, 1976), and inspired by the Deweyan notion of experiential learning (1938), many educators have called for more "authentic" forms of instruction and assessment, wherein students might more readily see, act on and learn from connections between academic content and problems of real life (Conrad & Hedin, 1991). There is, to be sure, a great range in what passes for service-learning, creating real challenges to the construction of unifying, over-arching principles and to the delineation of research questions that, once answered, will shed light on the advantages of this method of teaching and learning. Indeed, there would appear to be more than 147 definitions of service-learning in the literature (Kendall, 1990). Most specify that it must include *high quality service*; that is, the service must meet a goal defined by the community in which it is being performed. It must also afford the student an opportunity for *high quality learning*; that is, the experience must set the stage for the intellectual and personal growth of the student, and the learning outcomes assessment practices must reflect the contribution the service is intended to be making to the course (Service Learning 2000, 1999; Weigert, 1998). Furthermore, *the service and learning components of the course should enrich each other* (Furco, 1996)—that is, students should be able to learn more or better by providing the service in question, and the caliber of the service they are providing should be enhanced by what they are learning in the course.

Finally, the service should be integrated into the fabric of the course by means of *reflective and integrative assignments* (Kendall, 1990; Troppe, 1995; Weigert, 1998). Thus, service-learning is distinct from "volunteerism" in that it is explicitly linked to curricular objectives, and in that it professes a certain degree of academic rigor, embedded in the reflection and integration students engage in before, during and/or after their service experiences.

Participation in service-learning experiences has been demonstrated to benefit students in several important ways. Numerous studies have documented the effectiveness of service-learning as a tool for fostering students' civic responsibility, their acceptance of diversity, and their leadership skills as they move on to assuming roles in their communities as committed and engaged citizens (see, for example, Brandell & Hinck, 1997; Eyler & Giles, 1996; Giles & Eyler, 1994; Kendrick, 1996; Markus, Howard & King, 1993; Myers-Lipton, 1996; Shumer & Belbas, 1996). Service-learning has also been shown to have a powerful impact on students' moral, social-cognitive and emotional development (Batchelder & Root, 1994; Eyler & Giles, 1996; Eyler & Giles, 1999; Kendrick, 1996; Ostrow, 1995; Rhoads, 1997). Participation in service-learning has been identified as an important contributor to students' engagement in and commitment to school (Sax & Astin, 1997). Most studies of the cognitive impact of service-learning have focused on its effectiveness as a tool for helping students develop better critical thinking and problem-solving skills (see the review provided in Eyler & Giles, 1999).

As suggested by the fore-going, much of the outcomes research conducted to date speaks to the

degree to which service-learning has a positive effect on students' general personal and cognitive development. Despite the fact that so many operational definitions of service-learning specify that the service experience should "flow from and into course objectives" (Weigert, 1998, p. 5), relatively little is known about whether and how service-learning can be an effective tool for enhancing students' mastery of the curriculum itself. Therefore, as service-learning continues to grow in popularity on college campuses, one of the questions raised by faculty and administrators contemplating its incorporation into the curriculum is how this pedagogy will affect student learning. In their seminal book evaluating the impact of service-learning on students, Eyler and Giles cogently point out that "Before we can understand the academic value of service-learning programs, we need a clear idea of what learning might be expected from this approach and the extent to which these outcomes are consistent with the goals of higher education" (1999, p.3). Drawing on the models of learning provided by cognitive scientists (e.g., Bransford, 1993; Bransford & Vye, 1989; Resnick, 1987), they argue that the richness of students' experiences as they engage in and reflect on their service is more likely to result in changes in students' higher order thinking and application of their knowledge to new situations than it is to result in appreciable differences in "inert knowledge" (Whitehead, 1929) or other forms of lower level factual knowledge.

To date, much of the data that speak to the question of whether service-learning can enhance the achievement of the curricular goals of a course are based on faculty impressions and student self-reports (e.g., Cohen & Kinsey, 1994; Eyler & Giles, 1996; Gray et al., 1996; Hammond, 1994; Hesser, 1995), and relatively few studies examine more direct and objective evidence of student learning outcomes.

Thus, for example, Hammond (1994) reported the results of a survey of 130 faculty from throughout the state of Michigan who incorporated service-learning in their courses. She found that respondents perceived service-learning to be an effective method of representing the disciplinary content material, an effective means of enhancing students' critical thinking skills, and a motivator for self-directed learning. Hesser (1995) reported that faculty who have incorporated service-learning into their courses felt the experience allowed students to improve their written communication skills, their critical thinking/ analytic skills, their problem solving skills, and their understanding of key concepts and ideas from the course. Over three-quarters of those surveyed (83%) indicated that they felt that the quality of learning increased with the introduction of service-learning.

So far, researchers who have examined more objective data (e.g., course grades) report mixed results and modest gains. Miller (1994) and Kendrick (1996) report no difference between service-learning and traditionally-instructed groups of students in final course grades. Sugar and Livotsky (1988) report higher course grades for students in a child development course who had opted for a "service option" in which they spent two hours per week at a local preschool and documented their experiences in a structured journal. Since the course was set up such that students who completed the service option were awarded extra credit commensurate with the quality of their journal, it is unclear whether their higher grades reflected higher exam scores or just the effects of the extra credit. Shastri (1999) compared the performance of students enrolled in a traditionally-run section of a "Psychological Foundations of Education" course with students enrolled in a section of the course which required completion of a service-learning experience. She found no difference in the test scored of the two groups. Although she reported that students in the service-learning section earned more points for their reflective journals than the non-service-learning students earned for their literature review papers, it is not clear what to make of this difference, as the two assignments are not comparable.

In a study of the effects of service-learning on undergraduate students' learning outcomes in a political science course, Markus, Howard & King (1993) report differences between students who participated in the service-learning sections of the course and students who participated in traditional sections, on five of nine measures of change in attitudes and values, and on six of eight course evaluation survey items about what they had learned in the course, including whether they felt they had performed up to their potential and how readily they felt they could apply what they had learned in the course to new situations. Students in the service-learning sections also received slightly higher course grades (an average grade of B/B+ for the students in the traditional sections, and an average course grade of A-/B+ for the students in the service-learning sections). While the authors indicate that these course grades were based on a mid-term and final examination, they do not specify (a) whether the service-learning students out-performed the non-service-learning students right away (on the midterm) or only later (on the final), or (b) what sorts of items (multiple choice vs. essay, lower- vs. higher-order cognitive complexity) differentiated the two groups of students.

In a study comparing political interns with students studying the legislative process in an advanced

political science course, Eyler and Halteman (1981) found no difference in the two groups of students' mastery of facts about the legislative process, but they did find a significant difference in their ability to define a current problem and devise a strategic plan for a legislative solution to it. The interns' plans reflected a more realistic understanding of the actualities of the political process, while the other students' plans tended to rely on mechanistic textbook solutions.

Clearly, there is much uncharted territory in this area of inquiry, and indeed, the question of how service-learning can "enhance subject matter learning" tops the list of "ten unanswered questions in service learning research" (Giles & Eyler, 1998, p. 65). Drawing again on the words of these same authors, "If, as students believe, they do learn more from service-learning than from regular classes, then a more careful analysis of the value added to the traditional learning by service-learning is called for" (Eyler & Giles, 1999, p.63).

In this report, we share the results of an initial evaluation of the infusion of a service-learning requirement into a large-lecture introductory Child Development course. This course serves as the point of entry into the second largest undergraduate major on our campus that leads to a teaching credential. Although most of the students enrolled in the course indicate that they want to become K-8 teachers, the majority have had little formal experience with children in educational settings. *The aim of introducing the service-learning component into the course was four-fold. One goal* was to provide students with hands-on experiences and opportunities for reflection that would enhance their mastery of course material. A *second goal* was to provide them with experiences early in their college tenure that would give them a realistic picture of contemporary public school classrooms, so as to enable them to make a more informed decision about education as a career objective. A *third goal* was to provide a valuable service for the community, i.e., to enhance the educational experience of the children at the community sites. And a *fourth goal* was to facilitate emerging partnerships between the participating schools and the campus as a whole, and in particular with the College of Education and the Child Development Department. *The analyses reported here speak to the first of these goals.*

Method

Participants

The analyses reported and discussed here are based on the performance of 477 students enrolled in an Introductory Child Development course during Spring 1997 (n = 89), Fall 1997 (n = 110), Fall 1998 (n = 112), Spring 1999 (n =74) and Fall 1999 (n = 92). (The author did not teach the course during Spring 1998). Most were female (n = 450), and most were Child Development majors (n = 420) or minors (n = 24). Students enrolled in the course during the first three semesters (N = 311) comprise the non-service-learning group, and students enrolled in the course during the last two semesters (N = 166) comprise the service-learning group.

The Course

In-class time (three 50-minute sessions per week) was devoted primarily to lecture and discussion. Each semester, the course began with an introductory segment covering general theory, history and context, and research methods (3 weeks), and then proceeded through a chronologically-arranged overview of physical, cognitive, social and emotional development, from conception through adolescence (13 weeks). The same textbook was used all five semesters, and lectures covered essentially the same topics. Exams administered during the five semesters were virtually identical.

During the first three semesters (Spring 1997, Fall 1997, and Fall, 1998), students' experiential learning for the course was limited to a brief observation/write-up paper assignment. For this assignment, students were required to spend approximately 10-15 hours doing structured observations of the children in our department-run toddler/preschool lab school. Because of safety concerns, students were restricted to observing through one-way glass or through the fences that run around the outdoor areas of the facilities. Students were instructed to take notes on what they were observing in a format that permitted them to describe as objectively as possible what they actually saw and heard, and then to interpret those episodes as they related to specific content topics (e.g., gender differences, play, temperament, aggression, etc.). Students were then required to prepare a three-page summary of their notes that spoke specifically to their thoughts about the topics in question. As described to the students, the purpose of this assignment was two-fold: (1) to provide them with a picture of children in a naturalistic environment, and (2) to provide them with concrete illustrations of concepts being discussed in class and in the readings.

During Spring and Fall 1999, in lieu of the observation assignment, students were required to spend a minimum of 20 hours working with children at a school site, and reflecting on their experiences in a structured journal. At the beginning of these latter two semesters, students were given a menu of sites and types of activities for their service-learning requirement, and were asked to supply information

about their interests and experience with children of different ages and in different contexts. Students were then assigned to a service-learning placement. Most students were given their first choice. In all, 66 students fulfilled their service-learning requirement at a preschool-level site, 84 fulfilled their requirement at an elementary school-level site, and 16 fulfilled their requirement at a middle or high school-level site. Thus, the service-learning assignment differed from the observation assignment in two key ways. First, while the original observation assignment allowed, indeed required, students to go beyond simply consuming and assimilating knowledge and ideas presented in class and in the readings, the service-learning assignment required a much deeper and broader level of engagement, as students needed to think and do, and were expected to play an instrumental role in the classrooms where they were working. And second, the service-learning journal required significantly more and more varied reflection distributed over a longer period of time than the observation assignment paper. The process of compiling and integrating thoughts about the two experiences, then, would most likely be quite different, with the service-learning journal being much more elaborate and complex.

Data and Data Analysis Plan

In order to assess the contribution the service-learning experience made to the achievement of instructional objectives and student mastery of course content, several sources of information were examined.

First, scores earned by the students in the two service-learning cohorts were compared to scores earned by students from the previous three semesters on the *three examinations in the course* (two non-comprehensive midterms and a comprehensive final). The first midterm was administered in class, approximately half way through the course. A total of 40 points were available on this test (20% of the course grade). The second midterm was also administered in class, on the last day of classes for the semester. It was worth 50 points (25% of the course grade). Both midterms consisted of multiple choice and short essay questions. The final examination was administered as a take-home exam, distributed during the last week of classes and due 10 days later. It was worth 50 points (25% of the course grade). It consisted of integrative essays drawing on material presented throughout the course. All exams were graded by the author, using a detailed rubric for allocating points. Still, there was the possibility of unintentional bias. Therefore, a random sample of forty essay sections from the second midterm and forty finals (half drawn from the service-learning cohorts

and half drawn from the non-service learning cohorts) were given to a teaching assistant unfamiliar with the research question to grade. Scores assigned by the teaching assistant were virtually identical to those assigned by the author [$r = .98$, $p<.000$ and $r = .99$, p<.000 for the essay and final questions, respectively, and paired-sample (author and teaching assistant ratings) $t = .53$, $p = .599$ for the midterms essays and $t = -.63$, $p = .534$ for the finals].

Second, students in the two service-learning cohorts were required to make *weekly entries into a journal*, writing on topics specifically articulated with the core course content, so as to facilitate their reflection on, and integration of, experiences in the field, in the class and in the readings. Journal entries from throughout the semester, responding to questions about examples of constructs from class and about effects of context on children's behavior and development, were subjected to a content analysis.

Results

ANOVAs performed on the midterm and final exam scores revealed an advantage for the service-learning cohorts. *Students in the service-learning semesters earned significantly more points on course exams than did students in the non-service-learning semesters* (96.24 versus 91.70 of 140 possible points, respectively, $F(1,473) = 4.8605$, $p = .0280$, a 4.9 percent difference). Further analyses revealed that the difference was not uniformly distributed throughout the semesters' assignments. In fact, *the groups did not differ on their scores for the first midterm* (24.58 out of a possible 40 for the service-learning students and 24.39 for the non-service-learning group, $F(1,473) = .0777$, $p = .7805$). *The groups did differ significantly in their performance on the second midterm*, with the service-learning students out-performing the non-service-learning students by over 7 percent (32.99 vs. 30.81 out of a possible 50 points, $F(1, 473) = 9.3629$, $p = .0023$). Item analyses of the results of the second midterm revealed that *much of the difference in scores for the two groups of students came from superior scores that the service-learning students earned on their essays* (16.15 versus 14.50 out of 20 points, an 11 percent advantage, $F(1, 473) = 16.6960$, $p = .0001$). Students in the service-learning and non-service-learning groups *did not differ in their scores on the multiple choice portion of the test* when that part of the exam was examined as a whole, or when items were examined separately as a function of item type (definition/ fact/ application). Finally, *students in the service-learning group earned significantly higher scores on the final exam* (38.67 vs. 36.50 out of a possible 50 points, a 5.9 percent advantage, $F(1,473)$

TABLE 1

Comparison of Service-Learning and Non-Service-Learning Students' Performance on Course Exams

	Non-Service-Learning (n = 309)	Service-Learning (n = 166)	*F*	*p*
Total exam points	91.71	96.24	4.8605	.0280
Midterm 1 (total)	24.39	24.58	.0777	.7805
Midterm 2 (total)	30.81	32.99	9.3629	.0023
Multiple choice:				
Definitions	60.4%	63.9%	1.3446	.2468
Fact questions	61.2%	62.1%	.0690	.7929
Applications	47.4%	47.1%	.0099	.9206
Essay:	14.50	16.15	16.6960	.0001
Final exam	36.50	38.67	3.9560	.0473

= 3.9560, p = .0473). These data are summarized in Table 1.

A second series of ANOVAs sought to identify differences in exam performance among students in the service-learning groups. More specifically, the performance of students assigned to preschool, elementary school and middle or high school sites was compared. The only measure on which they differed was the number of points earned on the essay portion of the second midterm (16.72, 16.32 and 12.91 out of a possible 20 points, respectively, F (2, 163) = 7.2217, p = .0010). No significant differences emerged in the number of total exam points, in the number of points earned on the first midterm, on the second midterm overall, on the final, or on the journal. These results are summarized in Table 2. Additionally, no differences emerged among students at the three placement levels (preschool, elementary school or middle/high school) in scores earned on multiple choice items as a function of age-level reflected in the question (i.e., questions about children during the preschool years, the elementary grades, or later levels of schooling). These data are summarized in Table 3.

Analyses of student journal entries suggested a *significant degree of reflection about links between*

what students were hearing and reading about in class and what they were doing in their service-learning placements. And, these *links increased as the semester progressed.* The instructions for the first journal entry, to be completed before beginning their service-learning experience, asked students to write about what they expected of their assignment. Every single first entry mentioned *concerns or confidence about being up to the task.* ("I hope the students like me and listen to me." "I feel a little nervous—I hope I can do a good job helping the kids." "I'm looking forward to working in a real classroom. I think I'll be good with the kids.") In answer to the sub-question "What do you think you will learn?, How do you think you will grow?," most students (n = 145) indicated they expected the experience to help them *figure out if they wanted to pursue careers in education.* Most (n = 140) also expected *to learn specific teaching and behavior management techniques.* Interestingly, *not one of them anticipated that the service-learning experience would help them learn course material, nor mentioned the possibility that material they would be covering in the course would help them at their placements.* As the semester got under way, however, students consistently made connections between course material and their

TABLE 2

Comparison of Service-Learning Students' Performance on Course Assignments, as a Function of Service-Learning Site

	Service-Learning Site Level			*F*	*p*
	Preschool (n = 66)	Elementary School (n = 84)	Middle/High School (n = 16)		
Student Performance:					
Total exam points	95.94	96.83	94.43	.1318	.8766
Midterm 1 (total)	24.91	24.71	22.53	.8495	.4295
Midterm 2 (total)	33.35	33.07	31.12	.7441	.4768
Multiple choice:					
Definitions	66.2%	62.3%	61.9%	1.0721	.3447
Fact questions	61.7%	61.1%	69.6	1.1225	.3280
Applications	45.9%	47.3%	50.9%	.4341	.6486
Essay:	16.72	16.32	12.91	7.2217	.0010
Final exam	37.67	39.04	40.78	.9068	.4058
Journal	35.03	34.82	32.88	1.9511	.1454

TABLE 3
Comparison of Service-Learning Students' Performance on Midterm 2 Multiple Choice Items, as a Function of Age-Level Reflected in the Questions (10 Questions for each Age-level)

| | Service-Learning Site Level | | | | |
	Preschool (n = 66)	Elementary School (n = 84)	Middle/High School (n = 16)	*F*	*p*
Question Topic:					
Preschool	39.7%	44.3%	45.8%	1.5186	.2221
Elementary	45.2%	47.9%	42.6%	.7253	.4857
Middle/High	45.4%	40.8%	35.0%	2.2325	.1105

placement experiences. Several common themes emerged.

All 166 student journals contained entries that *illustrated students' understanding of cognitive and social-cognitive accomplishments or limitations.* The majority of the journals kept by the students working in preschool and kindergarten classrooms (n = 52) reflected on children's pre-concrete operational flaws in logic. ("I tried out the conservation experiment that you had described in class. I was sure they wouldn't be fooled, but they were.")

The majority of the journals of students working in preschool and kindergarten classrooms (n = 48) also cited episodes where children's cognitive immaturity made resolving disputes a challenge. ("I really saw what you meant by egocentrism when I tried to get these two little girls to see that it was just a mistake when the kid with the race car mowed down their Playmobil village.")

Many of the journals of students working in elementary school classrooms (n = 23) cited examples of information processing and memory strategies. ("You could see him mumble things under his breath, while he was waiting for the teacher to call on him…a rehearsal strategy.")

Several of the journals of students working in middle and high school classrooms (n = 6) cited examples of formal operational thinking among the students as they approached science projects. ("I was amazed at how systematic they were at figuring out the problem. They made a plan, made sure that would allow them to answer the question, and then one by one, they ticked off the different possibilities.")

Nearly every student journal (n = 156) contained entries *reflecting on social and emotional aspects of development.* Three topics were discussed nearly universally. First, the importance of *temperament* as a mediating variable in formal educational settings was mentioned in 150 student journals. Students commented on strategies that they observed teachers utilizing with children of each temperament type. They noted how transitions from one activity to another went more or less smoothly, depending on the temperament of the child(ren) in question. And they reflected on how knowing about temperament

enabled them to be "more patient," "more understanding," and "more effective."

A related topic, *individual differences in children's impulse control and frustration tolerance*, was mentioned in 135 students' journals. Every journal from students at a preschool site contained at least one reference to an episode where a child had had difficulty controlling their emotions or "using their words" to resolve interpersonal disagreements.

Most of the student journals (n = 125) mentioned *elements of the academic challenges* being presented to the children *that appeared to spur the more mastery-oriented students to action but that threatened to stifle the creative efforts of the more learning-challenged students.* Students commented on children's attitudes about their teachers, on the children's perseverance, and on the role competition might be playing in the classroom.

Students' entries also unanimously (n=166) *reflected continuous thought about nature/nurture questions, and about the role of context* (teacher style, characteristics of the situation, peers, family influences) in determining children behavior. Nearly every journal (n = 145) contained entries reflecting on whether behaviors children exhibited were innate or learned, or whether difficulties they were having in the class were the result of innate problems or combinations of circumstances. ("One little boy would always seem to pick fights, the minute it was recess time. It made me wonder if he's just naturally aggressive… Like we talked about in class. Is it that bullies are made? Or is it that they just are?")

Nearly two thirds of the journals (n = 105) referred to Bronfenbrenner's Ecological Systems approach, a theoretical perspective discussed in some detail in lecture, as students sought to attribute children's behaviors to factors present in the classroom, or to possible mismatches between standards and expectations at home and in the classroom. And many students (n = 65) attempted to account for children's behavior patterns in terms of observational learning and models of reward structures discussed in the course lecture. As the semester progressed, *these sorts of "describe and interpret" entries became more focused, more detailed, and*

more accurate in their research- and theory-based analyses of typical every-day events.

In all, the journals contained ample evidence of students' command of many of the key concepts undergirding the course, and of the links they were making between course lectures and readings and their experiences at the service-learning sites. Nearly every student (n = 160) commented on the *value of the hands-on experience as well as the opportunity for reflection*. In fact, in their final journal entries, in which students were instructed to look back at their first entries and comment on how their experience matched what their had anticipated, over half (n = 98) wrote about how mutually beneficial the classroom and hands-on components of the course had been for them, and how much each had enhanced the other.

Discussion

Clearly, these results are preliminary, and caution should be exercised in interpreting them. Thus far, only two cohorts of students, albeit relatively large ones, have participated in the service-learning experience, and differences are, in the main, modest in size. And to be sure, the data prompt one to ask more questions than they permit one to answer. *These caveats notwithstanding, however, the findings reported here support the general conclusion that the infusion of a service-learning requirement into the course has enhanced students' learning outcomes.* At this juncture, it might be helpful to speculate about why the advantages emerged, or failed to emerge, where they did.

First, *it would appear that it takes time for the academic advantages of service-learning to manifest themselves*. Thus, although differences did not emerge for the first midterm, students in the service-learning courses did better than their non-service-learning peers on both semester-end measures of their mastery of course content (the second midterm and the final exam). The essay questions on both midterm examinations concerned topics that students were writing about in their service-learning journals. And still, their performance on the first midterm suggests that the product of such reflection had not yet been completely assimilated into their mastery of course content. Unfortunately, separate scores for the multiple choice and essay questions on the first midterm were not recorded, and only total scores for that are available for analysis. It is, of course, conceivable that students in the service-learning groups out-performed students in the non-service-learning group on the essay portion of the first midterm as well as the second, but that they had done sufficiently more poorly on the multiple choice questions as to negate the advantage accrued on the

essay portion of the test. However, there is no plausible reason to place significant stock in this scenario. The most parsimonious conclusion is that there simply was no difference between the cohorts on the first midterm, but by later in the semester, the service-learning students had a better and deeper command of the course material. The increasing richness of the links made between course material and hands-on experiences at their placement site, reflected in their journals, is consistent with this picture. To date, assessments of service-learning as a pedagogy (for increasing students' higher-order problem-solving skills and for deepening their understanding and appreciation of pertinent disciplinary content) measure the effects of service-learning experiences by comparing cohorts of students at the end of a course, rather than taking measurements throughout the course itself (See Eyler & Giles, 1999, for a review). Perhaps this would be a fruitful avenue for future inquiry.

Second, it would appear that *the advantages of service-learning are most apparent with indices of students' learning that entail narrative assessments of their mastery of course content.* The service-learning students outperformed the non-service learning students on the essay portion of the second midterm and on the all-essay take-home final, but not on the multiple choice items of the second midterm. This advantage might stem from the experience the service-learning students had throughout the semester of writing narrative entries in their journals as a way of reflecting on their experiences and making the course content richer and more tractable. In any event, this finding is certainly consistent with that of other research that the service-learning experiences do not seem to enhance students' mastery of factual knowledge as much as they do their ability to apply their knowledge in new and more real-world situations (Eyler & Halteman, 1981, for example). In summarizing their observations of the contributions service-learning might make to student learning, Eyler & Giles point out that "service-learning students may not always perform better on tests of information recall at the end of a semester…but they may gain a greater depth of understanding and a greater ability to apply what they learn," and they advise us to look carefully for "qualitative differences in understanding of academic material" (1999, p.68).

Third, in a related vein, it is somewhat puzzling that there were *no differences in how well students in the service-learning group did on the multiple choice questions relating to the preschool, elementary school or middle/high school years as a function of their service-learning site level.* One might have expected an advantage on questions about the age-

level of child that best matched the age-level of child with whom they were working at their community site. Again, such a lack of a difference is perhaps more explicable if one assumes that the effects of service-learning are less significant, or at least less measurable, when indexed by this type of question format. And again, this finding is consistent with several studies that have similarly found no significant differences in student performance on multiple choice format tests of students' mastery of course content (Eyler & Halteman, 1981; Kendrick, 1996; Miller, 1994; Shastri, 1999; Sugar & Livotsky, 1988).

Finally, *while it is interesting to document pedagogical variables that affect the achievement of instructional objectives one course at a time, it is also important to take a longer view*. We are particularly interested in whether the apparent advantage conferred by the service-learning experience continues to benefit students as they move on into upper division lecture, lab and practicum courses (unilaterally and/or differentially), and whether any such advantages continue to manifest themselves primarily in more narrative forms of assessment. Our prediction is that students from the service-learning cohorts will do better than their non service-learning counterparts in contexts where their ability to think critically and apply knowledge to new problems and situations is being assessed, as opposed to in contexts where their ability to learn and remember factual information is valued. We are, therefore, at present, monitoring the progress of the two cohorts of students in the service-learning groups as they advance through their major and on into teacher preparation programs.

Note

An earlier version of this manuscript was presented at the April, 2000 annual meeting of the American Educational Research Association, New Orleans, LA.

References

Batchelder, T. & Root, S. (1994) Effects of an undergraduate program to integrate academic learning and service: Cognitive, prosocial cognitive and identity outcomes. *Journal of Adolescence, 17,* 341-356.

Brandell, M. & Hinck, S. (1997). Service learning: Connecting citizenship with the classroom. *NASSP Bulletin, 81*, (591), 49-56.

Bransford, J. (1993) "Who ya gonna call?" Thoughts about teaching problem solving. In P. Hallinger, K. Leithwood & J. Murphy (Eds.) *Cognitive perspective on educational leadership* (pp. 171-191). New York: Teachers College Press.

Bransford, J. & Vye, N. (1989). A perspective on cognitive research and its implications for instruction. In L Resnick & L. Klopfer (Eds.), *Toward the thinking curriculum: Current cognitive research* (pp. 173-205). Alexandria, VA: Association for Supervision and Curriculum Development.

Cohen, J. & Kinsey, D. (1994). "Doing good" and scholarship: A service learning study. *Journalism Educator, 48*, 4-14.

Coleman, J. (1976). Differences between experiential and classroom learning. In M. Keeton (Ed.) *Experiential learning: Rationale, characteristics and assessment* (pp. 49-61). San Francisco: Jossey-Bass.

Conrad, D. & Hedin, D. (1991). School-based community service: What we know from research and theory. *Phi Delta Kappa, 72*, 743-749.

Dewey, J. (1938). *Experience and education.* New York: Collier.

Eyler, J. & Giles, D. (1996). The impact of service learning program characteristics on student outcomes. Paper presented at the National Society for Experiential Education conference, Snowbird, UT.

Eyler, J. & Giles, D. (1999). *Where's the learning in service learning?* San Francisco, CA: Jossey-Bass.

Eyler, J. & Halteman, B. (1981). The impact of a legislative internship on students' political science skill and sophistication. *Teaching Political Science, 9*, 27-34.

Furco, A. (1996) Service learning: A balanced approach to experiential education. *Expanding boundaries: Service and learning*, 1-6.

Giles, D. & Eyler, J. (1998). A service learning research agenda for the next five years. In R. Rhoads & J. Howard (Eds.), *Academic service learning: A pedagogy of action and reflection* (pp. 65-72). *New Directions for Teaching and Learning, Vol.73.* San Francisco, CA: Jossey-Bass

Gray, M., Feschwind, S., Ondaatje, E., Robyn, A., Klein, S., Sax, L., Astin, A. & Astin , H. (1996). *Evaluation of Learn and Serve America, Higher Education: First year report, 1.* Santa Monica, CA: RAND Corporation.

Hammond, G. (1994), Faculty motivation and satisfaction in Michigan higher education. *Michigan Journal of Community Service Learning, 1*, 21-28.

Hesser, G. (1995). Outcomes attributable to service-learning and evidence of change in faculty attitudes about experiential education. *Michigan Journal of Community Service Learning, 2,* 33-42.

Kendall, J.C. (1990). *Combining service and learning: A resource book for community and public service.* Vol. 1. Raleigh, N.C.: National Society for Experiential Learning.

Kendrick, J. (1996). Outcomes of service-learning in an Introduction to Sociology course. *Michigan Journal of Community Service Learning, 3*, 72-81.

Markus, G., Howard, J. & King, D. (1993). Integrating community service and classroom instruction enhances learning: Results from an experiment. *Educational Evaluation and policy Analysis, 15*, 410-419.

Myers-Lipton, S. (1996). Effects of a comprehensive service-learning program on college students' level of racism. *Michigan Journal of Community Service Learning, 3*, 236-242.

Ostrow, J. (1995). Self-consciousness and social position: On college students changing their minds about the homeless. *Qualitative Sociology, 18*, 357-375.

Resnick, L. (1987) *Education and learning to think*. Washington D.C.: National Academy Press.

Rhoads, R. (1997). C*ommunity service and higher learning: Explorations of the caring self.* Albany, NY: State University of New York Press.

Rhoads, R. &. Howard, J. (Eds.). (1998). *Academic service learning: A pedagogy of action and reflection. New Directions for Teaching and Learning,* Vol. 73. San Francisco, CA: Jossey-Bass.

Sax, L. & Astin, A. (1997). The benefits of service: Evidence from undergraduates. *Educational Record, 78,* 25-32.

Service Learning 2000. (1999). Service learning in teacher education: Forging powerful connections. Materials prepared for the Service Learning Workshop, Stanford University, Stanford, CA, June 22-24.

Shastri, A. (1999). *Investigating content knowledge gains in academic service-learning: A quasi-experimental study in an educational psychology course*. Paper presented at the annual meeting of the American Educational Research Association, Montreal, Canada.

Shumer, R. & Belbas, B. (1996). What we know about service learning. *Education and Urban Society, 28*, 208-223.

Sugar, J. & Livosky, M. (1988). Enriching child psychology courses with a preschool journal option. *Teaching of Psychology, 15*, 93-95.

Troppe, M. (1995). *Connecting cognition and action: Evaluation of student performance in service-learning courses.* Providence, RI: Campus Compact.

Weigert, K. (1998). Academic service learning: Its meaning and relevance. In R. Rhoads & J. Howard (Eds.), *Academic service learning: A pedagogy of action and reflection* (pp. 3-10). *New Directions for Teaching and Learning, Vol. 73.* San Francisco, CA: Jossey-Bass.

Whitehead, A. (1929). *The aims of education*. Old Tappan, N.J.: Macmillan.

Author

AMY STRAGE is Professor of Child Development at San Jose State University, and Co-Director of the "It Takes a Valley" project, a federally-funded project designed to prepare teachers to teach in high needs urban schools. This research was supported by USDE Title II Teacher Quality Enhancement Grant #P336C990077.