

Service Learning Enhances Classroom Experiences but Does Not Inflate Grades: A Lesson from Courses in Ecology and Biology

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Abstract

Recognizing the efficacy of service learning, an increasing number of faculty members have begun to support this pedagogy, but service learning can be cumbersome for faculty and institutions to embrace. The inherent flexibility in the pedagogy can make its integration into already-busy, content-rich courses difficult if institutional support is limited or if the time commitment to develop effective service learning experiences is too great given the other professional responsibilities of faculty. In our encounters with faculty who are reluctant to employ service learning, we have also found that many of these colleagues fear the rigor of service learning and its assessment. They worry that service learning becomes “extra-credit,” or they question the experiences as “grade inflators” for service learning students compared to non-service learning students. To that end, we studied the grade distribution patterns of students in ecology and biology courses who completed optional service learning projects relative to students who did not, asking what motivated students to engage in service learning (i.e.,

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which students were completing service learning projects), and if students who completed service learning projects had higher course scores than students who did not? While service learning students tended to have higher averages than those who did not complete service learning, the increase in course score for service learning students was less than 3%. Students' grades could not decrease because of service learning. We argue that a ~3% increase in course score is not unreasonable given: the time (20+ hours of service) and assessment (daily log + 3-to-5-page formal reflection essay) requirements of successfully completing a service learning project; the increase in proficiency with course outcomes that students exhibit because of completing a service learning project, and; the strengthening of the connection among students, community, and institution that results from service learning experiences.

Introduction

At its core, service learning connects classroom experiences with community engagement for students and faculty alike. For students, service learning offers a myriad of benefits, including providing an opportunity for personal growth and enhancement of self-concept (Prentice & Garcia, 2000), improvement of interpersonal skills (Astin & Sax, 1998; Vogelgesang & Astin, 2000), and the exploration of potential career paths (Miller & Gonzales, 2009). For faculty, this pedagogical tool allows curricular flexibility (Leiser & Reilly, 2011; Spiezio, Baker, & Boland, 2005), creates the potential for long-term collaborations with community partners (Reardon, 2006), and offers an avenue for motivating students to become active participants in their own learning (Hesser, 1995). Without argument, the greatest benefit to faculty is the greatest benefit to students: students who engage in service learning often have a broader, deeper, better understanding of course material (Kendrick, 1996; Steinke & Buresh, 2002; Waskiewicz, 2001).

Recognizing the efficacy of service learning, an increasing number of colleges and universities have begun to provide institutional-level support for this pedagogy (Chadwick & Pawlowski, 2007; Prins, 2002). The embrace of service learning at an organizational level encourages faculty to use service learning (Abes, Jackson, & Jones, 2002) and fosters positive relationships between the institution and the community it serves. In addition, service learning improves students' attitudes toward the learning process (Movahedzadeh, 2011)

and toward the institution (Bender, 2006) and may contribute to increased retention (Simonet, 2008).

Despite its advantages, service learning can be cumbersome for faculty and institutions to embrace. The inherent flexibility in the pedagogy can make its integration into already-busy, content-rich courses logistically difficult (Abes et al., 2002). Individual faculty may be reluctant to use service learning if institutional support is limited (Levine, 1994; Ward, 1998) or if the time commitment to develop effective service learning experiences is too great given other professional responsibilities (Morton & Troppe, 1996). In addition, while there are a number of effective means for assessing student learning in service learning projects (Ash, Clayton, & Atkinson, 2005), faculty may struggle in determining exactly (in an assessable way) what students have learned from their service learning experiences (Cooks & Scharrer, 2006; Litke, 2002). Analogous to this concern, some faculty fear that service learning “is not academically rigorous” (Abes et al., 2002).

In our encounters with faculty who are reluctant to employ service learning, we have found that many of these colleagues fear the academic rigor of service learning and its assessment. They worry that service learning becomes “extra-credit,” or they question the experiences as “grade inflators” for service learning students compared to non- service learning students. To that end, we studied the grade distribution patterns of students in our courses who completed optional service learning projects relative to students who did not with two questions in mind.

First, we asked which students were completing service learning projects; in particular, did students who completed service learning projects have higher course scores than students who did not? This seemed likely as students who are highly motivated often engage in service learning (Baxter Magolda, 2000) and often maintain high marks in their courses. Alternatively, optional service learning experiences have been shown to motivate engagement by marginal students (Jones & Hill, 2003; Parks Daloz, Keen, Keen, & Daloz Parks, 1996). In this case, we expected grade distribution patterns of service learning versus non-service learning students to be similar. As part of understanding which students were engaged in service learning, we also asked whether students in program courses were more likely to complete service learning projects than students in

general education courses. It seems intuitive that students in program courses would have a career-oriented or personal interest in the types of service learning experiences offered in such courses; therefore, we predicted that we would see a greater number of students within program courses opting to complete service learning projects relative to their non-major counterparts. Although this was our expectation, we did not discount the notion that non-major students might be motivated to explore alternative career paths through short-term service learning projects (Jones & Hill, 2003), resulting in similar participation rates in program versus general education courses.

Second, we asked whether or not the completion of service learning projects inflated the grades of service learning compared to non- service learning students. service learning experiences are optional in all of our courses, and, if completed, the projects are worth a significant portion of the overall course (>10%, see below). Because service learning projects are voluntary, the completion of such a project cannot lower students' grades. The question, then, was not whether students benefitted from completing service learning projects; rather, the question was whether or not service learning projects gave an unfair advantage to students who could or would opt to complete them. That is, did service learning become extra-credit when it was an optional part of a course, unfairly and/or artificially inflating service learning students' grades? Certainly, our intentions when employing service learning pedagogy were that this was not the case.

Data Collection and Analysis

This investigation includes data collected over a period of 6 years (2006-2011). The data represent overall course averages for students enrolled in 22 sections of 5 different biology courses that were taught by JKL on the Monroe Campus of Northampton Community College. Each course had both lecture and laboratory/field components, and each course was worth 4 credits toward the students' academic progress.

Among the courses was Field Ecology, a non-major's science elective offered as part of NCC's general education core curriculum. Data from 4 sections of Field Ecology are included in this study; overall enrollment in these sections was 115. Also included were two courses required of students majoring in Biological Science and two courses offered as electives within the Biological

Science major. The required program courses were Biology I and Biology II; total enrollment in these courses was 181. The program elective courses included General Ecology and Environmental Biology which together had a total enrollment of 111.

In all instances, service learning was offered to students as an optional part of the course in which they were enrolled. The introduction of service learning was accomplished in the same manner in each section of each course. A brief description of the service learning option was included in each course syllabus and was explained to students on the first day of each semester during the normal period of syllabus review. The service learning description was the same for each course. Students were prompted that service learning was not “extra credit;” rather, if they elected to engage in a service learning project, that project would be substituted for another part (of the student’s choosing) of the coursework. In each instance, a completed service learning project was worth 100 points, which a student could substitute for a single hourly examination, a laboratory/field project, or a written assignment of equal value. While assignments in the courses were dynamic over the six-year study period, the 100-point designation ensured that service learning was worth no less than 10% and no more than 16% of any overall course score (mean value \pm SE: $13.40 \pm 0.47\%$).

As a follow-up to the initial introduction of service learning, all students (in every section of every course) received within the first week of the semester a handout that better defined and described service learning experiences than space in the syllabus would allow. That is, if students completed a service learning project, the “assignment” was the same. To receive credit for a service learning project, a student had to: commit to a project within the first 3 weeks of the semester; complete a minimum of 20 hours of service during the semester in which he or she was enrolled in the course, and; maintain a “daily log” of the work to document the hours spent and the tasks accomplished during his or her service learning project. At the end of the 20-hour project and before the final class session of the semester, each service learning student had to complete a 3-to-5-page reflection essay, submitting the essay along with the daily log to JKL. Typical of reflection essays (Cooks & Scharrer, 2006; Sass, 2013), students were expected to consider the work they had done relative to the learning outcomes of the course in which they were enrolled. Students were also prompted that service learning was by no means an “easy way to get 100 points.” The service

learning handout included a rubric that was used when assigning scores to service learning projects. To earn an “A” mark, the student had to complete the full 20 hours of service, keep a thorough daily log, and write a quality paper that clearly demonstrated connection between the service learning project and the course. The service learning handout also included the contact information for a number of community partners with whom JKL has had positive interactions and whose missions were consistent with the learning outcomes of all of the biology/ecology courses.

A two-way ANOVA was conducted on course scores for students in the different courses who completed service learning relative to those who did not. To determine the influence that a service learning project had on an individual student’s course score, a two-way mixed ANOVA was conducted on the course score the student did earn (including the service learning project) compared to the score the student would have earned had he/she not completed a service learning project for the different types of courses. That score was determined from the student’s average in the course without the service learning project and without the assignment the student chose to eliminate (i.e., the average was calculated as though the course had been worth 100 fewer points). For the analyses, courses were considered as: non-major’s general education elective, required program course, or program elective.

Results and Discussion

Over the six-year study period, a total of 171 students elected to complete service learning projects as part of their course curricula. While the total number of students engaging in service learning increased over the study period, this increase was related to an increase in enrollment in the courses and not to an increase in service learning participation rate. That is, the proportion of students engaging in service learning was unrelated to year of study ($r=0.062$). Over the study period, participation rates were highest in program elective courses (53.15%) relative to required program courses (48.62%) and the general education elective (20.87%). This trend was consistent with our hypothesis that biology majors would take advantage of opportunities to make professional connections within their chosen career field. For example, in her daily log one biology major wrote:

I like that I made contact with [the Pocono Avian Research Center], and they [have] invited me back for spring migration, and I’d like to make

contact with other Biologists to secure a place for myself in the field. I feel like I belong there.

Although participation rates were lowest among students in the general education course, it is clear that those students who did complete service learning as part of this course found the experience valuable. For instance, one general studies major enrolled in Field Ecology wrote of her experiences with a local non-profit maple-syrup operation:

I found . . . service learning to be wonderful. Many students, including myself, are often swamped in classwork, normal work, and other activities of their daily life. Service learning provided me with the opportunity to step outside the classroom and still earn credit for assignments. It was really fun getting to work outside and help out the community at the same time.... We learned to identify maple trees . . . and learned all about the actual process to create maple sugar and maple syrup.

From a qualitative perspective, the enriched experience had by this student clearly demonstrates one of the fundamental purposes of service learning, i.e., service learning provides a richer understanding of course learning outcomes because of the work done outside the classroom.

As service learning is an optional component of our courses, a student's grade cannot be lowered by completing a project. While it was clear that exploring a chosen career motivated students to perform service learning, we wondered whether the incentive of a beneficial service learning score might motivate marginal students to participate in service learning (Parks Daloz et al., 1996). These scores were consistent with student performance at NCC as a whole; that is, the majority of students in our courses generally achieved transferrable marks of "C" or better.

Among our students, those who completed service learning earned significantly higher course scores than those who did not (main effect of service learning within two-way ANOVA: $F_{1,34}=12.220$, $p<0.001$). The tendency of service learning students to score higher than non-service learning students was unrelated to the type of course in which the students were enrolled (main effect of course type: $F_{2,34}=1.428$, $p=0.254$; course type x service learning participation interaction: $F_{2,34}=0.227$, $p=0.798$). That is, no matter the type of course, students

who performed better often opted to complete service learning projects. This level of motivation is clearly illustrated in the reflection essay of an “A” student enrolled in the general education elective:

Being a part of Project OwlNet is something I would participate in even if there wasn't any credit involved. Darryl and Jackie [the USGS Bird Banders on the project] have taught me ethical practices in bird banding, the importance of conservation efforts, and techniques used in bird banding. And more importantly, to me, they've introduced me to a part of myself that I never even knew existed, and that is that I love birds.

A student who achieved high marks in both of the program elective courses wrote:

I completed my service learning hours at the bear check station in PA State Game Land 127.... Each day was a different experience because I was able to do more task[s] each day and with each bear.... Overall I think this is the best field experience of my academic career. I learned so much in 21 hours by doing hands on work and networking with the people that I will be able to take this experience with me and apply it to my future academic career and beyond. I enjoyed it so much I asked if I could return the following season for the experience again.

This trend notwithstanding, we wanted to determine whether service learning had inflated these students' course scores or whether higher-performing students completed service learning. To this end, we conducted a mixed-ANOVA on the scores that service learning students would have received without completing their service learning projects compared to the scores they did receive for the different types of courses. There was no difference in grade distribution for students in the three different types of courses (main effect of course type: $F_{2,168}=1.13$, $p=0.33$). There was a significant difference in the course score for service learning students pre- and post-project (effect of service learning: $F_{1,168}=191.08$, $p<0.0001$), with the increase in course score being similar for the different types of courses (service learning \times course type interaction: $F_{2,168}=0.38$, $p=0.68$). This result was not surprising inasmuch as no student's grade could be lowered by completing service learning. However, the question was not whether service learning benefitted these students. The question was whether completion of a service learning project unfairly inflated these students' course scores.

Most students who completed service learning projects earned “good” marks for their efforts. The average service learning project score for students in: the general education elective was $86.58 \pm 4.62\%$; the required program courses was $91.55 \pm 1.71\%$, and; the program electives was $91.19 \pm 2.43\%$. The scores that students earned for service learning projects tended to be higher than average student scores on individual assignments and exams, corresponding to a nearly 3% increase in overall course score for service learning-completing students. Such an increase in score can be important to a student. For example, the 2.68% average increase for students in Field Ecology meant the difference between a mark of “C+” and one of “B-.” Likewise, the “B-” average for service learning students in the program elective courses shifted to a mark of “B.” The pre- and post-service learning marks for students in the required program courses remained a “B-”.

Conclusion

Earning a “B-” instead of a “C+” mark for a course may indeed be a proud accomplishment for many students. However, we argue from three non-mutually exclusive perspectives that the less-than-3% increase in course score for a service learning experience worth 13% of a course is not inappropriate.

First, completing a service learning project is a relatively rigorous endeavor. To achieve a mark of “A” for a service learning project in our courses, a student must fulfill the entire 20 hours of service, maintain a thorough and accurate daily log, and write a quality reflection essay. For this 20+ hours of effort outside the classroom, the student may elect not to take a single hourly examination (or similarly valued assessment, see above).

Motivating students to dedicate time and energy to their studies beyond the hours spent inside the classroom has long been a goal of many faculty, ourselves included. A standard expectation is that students devote at least two hours weekly of their own time to “schoolwork” outside the classroom for each credit of coursework they are taking (McCormick, 2011). For a full-time student, this corresponds to a weekly commitment of 24-36 extra-classroom hours. Likewise, for a single 4-credit course, a student should ideally spend 8 hours on coursework each week.

Working within this 2:1 framework, a student in a 4-credit course should spend 30-40 hours preparing for a single hourly examination. That is, if hourly examinations are spaced 4-5 weeks apart during a typical semester (as they are in our courses), a student should set-aside 30-40 hours of extra-classroom time to prepare for that examination (McCormick, 2011). In this scenario, the 20+ hour service learning experience in our courses does not seem to compare with the commitment necessary to prepare adequately for an examination.

Unfortunately, but not surprisingly (NSSE, 2013), the average college student does not dedicate the ideal amount of extra-classroom time to coursework. For a number of reasons, including family, employment, and social commitments, full-time college students average closer to 15 hours weekly of extra-classroom time spent on coursework (NSSE, 2013). This 15-hour commitment includes not only studying, but also time spent “reading, writing, doing homework . . . and other academic activities” (McCormick, 2011; NSSE, 2013). Indeed, time spent studying is likely far less than this; in one study, Gurung (2005) reported that most students in her courses studied 4-6 hours for a single examination. The time and energy that students commit to their service learning projects in our courses are therefore well beyond the “average” level of commitment that a typical student exhibits when preparing for a typical examination; thus, they perform well and their grades improve.

Second, completing service learning projects provides students with direct reinforcement of the learning outcomes of the course in which they are enrolled. The community partners with whom students work have missions consistent with the themes of all of the biology/ecology courses, and JKL an ER meet with representatives of partner organizations to ensure that each project undertaken by our students not only fulfills a need of the partner organization but also meets course learning outcomes. For example, students successfully completing General Ecology are expected (among other outcomes) to “demonstrate . . . written communication skills necessary for sharing discipline-specific knowledge and communicating professionally” and to “conduct scientific . . . research on . . . topics as they relate to science, technology, and society.” While there are a number of classroom assessments in place to gauge student progress toward these outcomes, the service learning project provides students with an in-depth “real world” connection of classroom material to practical experience. The

outcomes of General Ecology are mirrored in the following excerpt from a student's reflection essay:

Project OwlNet was a very fun and informative experience. I had never heard of capturing owls before it was mentioned in class. Once it was explained, I was immediately interested and wanted more information. I learned many goals such as supporting the continuing expansion of a network of migrant owl banding stations, advocate the use of standardized, comparable netting protocols, and to improve communication and coordination among...research stations in North America and beyond.... I hope I'm able to return next year and capture some more owls.

This student's level of proficiency with course outcomes is clear throughout her essay, and her essay is typical of those written by our service learning students. Demonstration of such proficiency because of the service learning experience, we argue, is worthy of a ~3% increase in course score.

Third, explicit in NCC's Mission Statement is a dedication to provide "learning experiences in partnership with the dynamic, diverse communities we serve." Such a mission statement is not unique to NCC; myriad colleges and universities recognize the importance of fostering their students' connection to community. Language such as preparing students "to serve society" (Harvard University) or promoting "service" (Muhlenberg College) and "responsible citizenship" (University of North Carolina Wilmington) is commonplace in mission statements. Likewise, institutions emphasize students' connection to "organizations beyond the university" (University of California Las Angeles) in order for students to invest their energies in "improving communities" (Baltimore City Community College).

This connection between students and community is intrinsic to the service learning experience. Students embed themselves in projects that benefit partner organizations, that foster positive relationships between college and community, and that satisfy institutional missions. Concurrently, students achieve a better understanding of course material (Waskiewicz 2001), improve their "soft skills," (Miller & Gonzales 2009), and develop a sense of commitment to community which persists well-beyond their college tenure. Such achievements are well worth a ~3% increase in course score and are exemplified

in a correspondence that one former student wrote to JKL after her graduation from NCC:

I also took the chance to do some service learning at a local CSA. I helped the farmer who had spent many years in the Peace Corps obtain grants...I then acquired employment on the farm instead of spending my summer in a grocery supercenter. While working on the CSA, I gathered a greater appreciation of service to school, community, and colleagues. Everyone benefitted from being part of this one project.

The answer to the question of whether service learning benefits students' grades is "yes." However, given the energy and enthusiasm seen in these students, their scores are not artificially inflated. Through their service learning experiences, these students advanced the college mission and aided the community. Most importantly, the students demonstrate an applied, better, deeper understanding of both course material and civic commitment.

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