

Case Study in Implementing a Service-Learning Class in a Construction Management Curriculum

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Service-learning is a pedagogical approach which gives the students an opportunity to develop professional and social skills in concert with learning and reflecting on curricular material. This is achieved through a student's active participation in a meaningful community service project, open and interactive reflection, formal class lectures, and discussions. This case study discusses the results of implementing a pilot service-learning undergraduate class in a state university construction management program. The course was offered as a two-credit hour voluntary technical elective in the Spring quarter of 2008. The organization of this study first puts service-learning into context by giving a brief background and history of the subject relative to higher education. Objectives, goals and potential benefits of using service-learning as a strategy for higher education instruction are highlighted. The course's development, implementation, execution, and outcomes are featured. The results were outstanding and exceeded most expectations. This study is written in such a way as to be used as one potential template. The hope is that the analysis and study of this case will be used as a practicum by others to help employ a service-learning element in their construction management curriculum.

Keywords: Service-learning, community-service, construction, experiential-education, case-study

Introduction

A noble goal of undergraduate construction management programs should be to find new and interesting ways to get students out of the classroom and into the field. The construction management curriculum is generally becoming more and more inundated with classroom based material as we mature as a field of study. This trend is viewed positively as new subjects such as BIM and LEED are integrated into undergraduate programs. As a result, some undergraduate construction programs are concerned their students are further distancing themselves from the inherent benefits of construction field experience. Many construction programs do an excellent job of integrating jobsite visits, managing internship programs, and creating class exercises which emphasize student interaction with the construction field. Many campus clubs, including construction related clubs do a tremendous job of helping to facilitate student volunteering in the community. Service-learning is an additional tool which can be used to create new ways to enhance the curriculum for the students. It combines the construction management process, with hands-on construction activities, for community service project, and adds both breadth and depth to the experience.

Service-Learning Definition

From the many service-learning definitions found, one was written specifically to students and encompasses the learning objectives of the developed class; "Service-Learning is a method of teaching and learning that enriches your life by engaging you in meaningful hands on service to your community while giving you the opportunity to gain valuable knowledge and skills that connect with your classroom studies" (Schoenfeld, 2003, p. 3). To elaborate a bit further, the National and Community Service Act of 1990 defines service-learning as: "a method under which students or participants learn and develop through active participation in thoughtfully organized service that is conducted in and meets the needs of a community; is coordinated with an elementary school, secondary school, institution of higher education, or community service program; helps foster civic responsibility; and this is integrated into and enhances the academic curriculum of the students, or the educational components of the

community service program in which the participants are enrolled; and provides structured time for the students or participants to reflect on the service experience”.

General Background

Unbeknownst to many newer faculty in higher education, service-learning actually has a past. There is a presumption that this is a new pedagogy or a paradigm shift (Stanton, 1999). However, service-learning’s historical background can help further ones understanding of the subject. Any discussion of service-learning should to start with John Dewey. Dewey was a philosopher of education and ethics, a pragmatist who believed in educational progressivism. Among his many other interests, he was a pioneer and staunch proponent of hands-on learning and experiential education (Jacoby, 1996). Born from of his earlier work, service-learning took root in the 1960’s and 1970’s. It was not a revolution in education but an evolution of bringing “theory and practice, schools and communities, thought and action closer together” (Stanton, 1999, p. xi). To better understand the impact of service-learning over the years, it helps to break it down into three camps. Each camp emphasizes particular goals of service-learning, puts them in a cultural context, and identifies the faculty’s motivation for pursuing it.

Social Activism Camp

The faculty pioneers of the 1960’s predominately used service-learning to promote goals of a more pluralistic nature. The objective at this time was to find ways to integrate the student population with other (very different) socio-economic classes -- specifically middle class (predominately white) students providing service to poor (predominately black) neighborhoods. The emphasis was on the social aspects of the situation, not the community service and certainly not the curriculum learning. Many pioneers enjoyed existing in the margins of higher education and felt that social change-oriented action was incompatible with the critical learning activities of the institution. Moving service learning into the institutional mainstream was irrelevant to most and perceived a corruption of the movement. One pioneer said, “It would rob its [service-learning’s] power to radicalize students and bring justice to society. I liked it better when it was more marginal, when there were fewer rewards, when students came to it with a more fiery desire for change in the institution and the world” (Stanton, 1999, p.170).

Community Service Camp

With the fading of social activism, faculty continued to carry the torch through the 1970’s and early 1980’s with an emphasis on service to the community. This form of service-learning was much closer to true “Deweyism” which emphasized community service first. This camp believes that its all about the engagement of students and the institution with the community. Dewey and his followers believed in connecting education with democracy and citizenship development to “... help universities understand their role as not only seeking to know how society works, but help transform it...” (Stanton, 1999, p.233). Service-learning took a big step forward; it was no longer just about the students and the faculty but about the institution and the community.

There was a lull in the service-learning movement through the high flying 1980’s. Many university institutions astutely recognized both the apathy of this generation and their own distancing from local communities. In response to both these developments, the Campus Compact was initiated in 1985. The main goal then, as today, was to help prepare students to participate in a democratic society and engage local communities. The Campus Compact has since grown to a coalition of over 1,100 colleges and university presidents who help facilitate student involvement in community service (Campus Compact, 2008).

Service-learning was turning mainstream and becoming institutionalized. Students, faculty, presidents of universities, and even the White House were advocating for service-learning (Wutzdorff, 1997). The faculty pioneers of the 1960’s and 1970’s were understandably resistant - “To the extent it [service-learning] becomes institutionalized and you begin to evaluate it and encapsulate it in any formal structure, you begin to limit its capacity” (Stanton, 1999, p. 191). Many current practitioners would disagree. By institutionalizing service-learning, one exposes it to the light of academic discipline. It brings in the recourses of the university, allows for a more collaborative atmosphere, and helps service-learning to remain more sustainable over time.

Educational Tool Camp

The revival of service-learning in the early 1990's marked a new paradigm in its development, a model which now emphasized education first. The pendulum has now swung to a more balanced approach which seems to better fit the current environment. Even some of the original pioneers admit - "The reason educational institutions should do service learning is because it's good learning. The focus needs to be on the learning, not on the service. Service is the by-product. When colleges and schools support service-learning, they have an obligation to make sure that whatever the experience is, it helps students learn" (Stanton, 1999, p. 209). The 21st century has seen a tremendous surge of interest in service-learning. This is partially attributable to the acceptance of service-learning by the entire academic community. It is also societal, personified by the students of today. While on the surface today's generation may not appear it, our experience is that they are a highly collaborative group who has a sincere desire to be more experiential. This is fertile ground for service-learning.

History Lesson

The primary reason to understand the past is to learn from it "because there are great ideas developed in the history of man, and these ideas do not last unless they are passed purposely and clearly from generation to generation" (Feynman, 1998, p 4). A professor at the University of California said: "If the road to hell is paved with good intentions in education as elsewhere, then there is nowhere better paving than in the concept of Public Service. In the sixteen years since I joined the faculty I have heard more bad educational policy justified in the name of Public Service than by any other invocation, human or divine" (Farmer, 1972, p.65). This is a warning to the practitioners of today who need to be cognizant of these dangers. Faculty need to avoid unconsciously using students for some social agenda or worse, slave labor, with no real purpose. The projects being selected should have substance and be meaningful (a thick versus thin experience) for both students and the community. A genuine empowering of the students is vital to a program's success.

Goals & Objectives

Service-learning is not an island unto itself. It has numerous organizational fingers with many of the same goals which contribute to and compliment each other (Stanton, 1999):

- Community Church Organizations
- Career and Community Development Programs
- Field Study and Education (Experiential Learning)
- Cooperative and Internship Education Programs
- National Service Organizations (Peace Corps, etc.)
- Corporation for National & Community Service (Learn and Serve America)
- National Society for Experiential Education (NSEE)
- Corporate Volunteerism Programs

One of the key differences between service-learning and simple volunteer service is an element of reciprocity. In this exchange, one "avoids the traditionally paternalistic, one-way approach to service in which one person has resources which they share 'charitably' or 'voluntary' with a person or group that lacks resources" (Kendall, 1990, p.22). The other significant factor which separates service-learning from its list of relatives above is a congruent and formal learning environment. The associated classroom experience can be leveraged by the professor to help formulate student goals, integrate formal lectures, encourage group interaction, support reflection, and evaluate successes and failures. Reflection is an underutilized pedagogical tool and "crucial component of the community service-learning experience... [which] should place the experience into a broader context" (Jacoby, 1996, p. 31).

Congruency

The goal of most higher education institutions is to pursue teaching, scholarship, and service. These may have different emphasis depending on where one falls along the continuum from a vocation institution to a research university. However, the service portion of this equation has traditionally been overlooked. Faculty members have an opportunity to meet the stated goals of the institution while at the same time achieving the admirable aspirations of service-learning. There is a strong congruency with Cal Poly's Mission Statement and the objectives of service-learning.

Cal Poly fosters teaching, scholarship, and service in a learn-by-doing environment where students and faculty are partners in discovery. As a polytechnic university, Cal Poly promotes the application of theory to practice. As a comprehensive institution, Cal Poly provides a balanced education in the arts, sciences, and technology, while encouraging cross-disciplinary and co-curricular experiences. As an academic community, Cal Polly values free inquiry, cultural and intellectual diversity, mutual respect, civic engagement, and social and environmental responsibility.

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The congruency between the university mission statement and the primary goals of service-learning (specifically the development of this class) are all together obvious. An ancillary goal of the class, which is also in line with the mission statement, includes co-curricular and cross-disciplinary objectives. The class was successful in attracting and recruiting students from the Landscape, Architecture, and Construction Management departments. These students interacted in a meaningful way with their peers on a real project, providing an invaluable experience for all.

Method

As construction management continues to mature as a discipline, the department's task of incorporating an ever increasing amount of material into a set program gets more and more difficult. New project delivery methods, sustainable building, and building information modeling (BIM) are all worthy of integration into a program. Since increasing the number of credit hours in a program is rarely an option, many departments are faced with tough decisions regarding the prioritization of curriculum material. Over the years, many faculty have observed programs drift away from time-consuming, experiential learning class material. Construction management departments, acutely aware of this trend are always looking for new and creative ways to round-out and supplement a student's lack of hands-on construction experience. It is in this spirit and understanding with which this class was developed.

Course Development

Only after developing and implementing this course was the time taken to study, understand, and converse with others about the history and pedagogy of service-learning. Despite this lack of background, the class was still successful in its design and application. The ease of this effort further emphasizes the point that construction management and service-learning are a natural pairing. The difficulties many other disciplines may encounter when trying to craft a meaningful service-learning experience become opportunities when applied to construction management. All the pieces of the puzzle (experiential-learning, community service, curriculum reinforcement, teamwork, leadership, and hands on construction experience) fell right into place, despite the fact that there were few preconceived models or constructs to work from.

The course was built around two core ideas. First, goals and objectives of service-learning were incorporated into a hands-on construction experience. Second, the students were exposed to the entire construction process in meaningful ways. To fit all this into a ten week course, the construction process had to be boiled down into its most essential parts. This is explained further below. The service projects themselves needed to be small and thus manageable. An arbitrary number of \$1,000 - \$2,000 worth of materials was chosen. But the projects were treated and managed as if they were \$100,000 - \$200,000. The same basic steps and principles of the construction process apply regardless of the size of the project. This is equally true in the field, whether building a small renovation project or new multi-million dollar facility.

Partnerships

Fortunately, a number of supportive and helpful partners were found along the way. Because this course was going to involve student physical labor, the university wanted to be involved from a liability mitigation standpoint. Administrators were found who were sympathetic to the cause and actually spearheaded efforts to navigate these waters. The construction management department helped set up a new two credit hour technical elective course and found classroom space. Industry support was tremendous. To our sponsor's credit, the financial goal of four projects at \$2,000 each was readily achieved. Up to this point, there was a comfortable familiarity with the aforementioned partners. But going out and finding the right community service partners was a challenge which took us outside our comfort zone.

The first potential community partner approached was naturally Habitat for Humanity. Unfortunately, the local chapter was focused on building new homes and not renovation work at the time. After much searching, a local group called the Economic Opportunity Commission (EOC) was found. This group operates as a one stop conduit to assist low-income families and the elderly to receive assistance and free services. The EOC partners with Pacific Gas and Electric (PG&E), the Area Agency on Aging (AAA), and the Home Energy Assistance Program (HEAP) to fund weatherization and home repair projects. Many times, the funding for such projects runs short and that is where the class fits in. Working with the EOC over the next two months, a letter of understanding was ultimately developed which mitigated any potential liabilities issues. A source for community service projects which matched the goals of the class was achieved.

Execution. Being on an academic calendar based on the quarter system, allows only ten weeks to accomplish the goals of the class. Below is a very brief outline and description of the course and each week's objectives:

1. Organization and Safety: Eighteen students participated in the class. Three were recruited from architecture, one from landscape, and the rest from construction management. The students were put into four groups and each assigned a project. With the EOC's help, the entire second day of class was devoted to safety procedures.
2. Client Relations: The groups were instructed to meet with the client and the principals involved. This included brief agendas, meeting minutes, assessment of existing conditions, a site survey, and a preliminary scoping of the project.
3. Scope: Once the scope and hierarchy of that scope was established, an abbreviated set of construction documents was generated. Some groups had to develop their drawings and specifications to the point of permit submission.
4. Estimate: Each was given a material budget of \$2,000 which they were required to adhere to. This budget and estimate needed to be continually monitored and updated as the scope changed and "crept" for various reasons.
5. Schedule: There was not enough time to produce a CPM cost-loaded schedule. Most created a simple project bar chart (scaled in days and hours) which was frozen, then updated to show a comparison between work planned and work actually performed.
6. Tracking & Documentation: A procurement schedule had to be generated forcing students to plan, schedule, and budget their material purchases. Time cards were filled out and tracked by each group for any person performing work on their site.
7. Construction: Time had to be set aside to actually build the projects. The type of projects included a new handicap ramp, new porch and steps, full front yard renovation, and exterior skin renovation of a mobile home unit.

8. Construction: As the projects progressed, the students learned about leadership, coordination, information dissemination, cooperation, effects of changes, decision consequences, and the negative impacts of not sticking to the original design.
9. Close-out: Punch lists were generated, executed and signed-off. As-built drawings were produced for a complete record. A project debriefing was conducted based on schedules and estimates versus completion dates and actual costs.
10. Reflection: Because the projects took more time than originally hoped, there was not much time for this activity. Each team did present their results to the rest of the class. But more time should have been spent sharing and reflecting on lessons learned.

Results

Based on most intuitive methods of measurement, all four community construction projects were a great success. Each project was constructed under budget, on schedule, of superior quality, and with no accidents. While only \$8,000 in materials was raised, over 1200 hours of service was donated to the community. The benefits to students are simply too numerous to list. But some of the less obvious include honing problem solving skills, generating creative solutions, social interaction, personal development, and a sense of achievement possibly not experienced before. The University's goal of community involvement and service moved several steps forward. The Construction Management Department furthered its goal of ensuring that students receive much needed construction field experience. The community was thrilled that university students were taking an active role in the community and reaching out (in a service oriented manner) to help the surrounding neighborhoods. The client satisfaction of the elderly and low income families who were helped was immeasurable. Many of them are highly active in their communities which made it rewarding to give back to them for their past selfless efforts. Interestingly, the students working at the construction sites attracted the surrounding neighbors in each project area. They all wanted to show their support in some way. Many wanted to help or assist directly, others wanted to donate money, but all wanted to connect with the project in some way even if it was just to share a smile.

Student Evaluations

Course evaluations were given to students who anomalously rated the class, made suggestions, and gave their overall impressions. Without exception, all respondents gave the course a ranking in the upper eightieth to ninetieth percentile. To avoid a myriad of analysis, one comment written by a student was indicative of the survey; "I enjoyed being involved in a course where we had the opportunity to manage and physically build a real life construction project. It was a great feeling to apply previous class materials while at the same time helping families in need" (Student Survey, 2008)

Award

On May 15, 2008, President Baker awarded the 2008 California Polytechnic President's Community Award for Service-Learning the instructor and the class. This was a great honor bestowed upon everyone for the work and effort which was put forth to create and implement the course.

Discussion

There are, of course, many dangers to avoid and many ideas to build upon when developing and teaching a course like this for the first time. The syllabus and course outline were heavily relied on to keep the students on track. Preplanning was key as it encouraged students to anticipate problems and be proactive with their project. As indicated before, more time should be spent on meaningful reflection during class. Going through the motions of the course is one thing, but pausing, sharing, and reflecting on the process continually in class would have been a beneficial canon.

From a jobsite perspective, students relied a little too much on the EOC when they stumbled in the field. One project had to go through the chancy process of obtaining a permit. For expediency and schedule control, this should be avoided in the future. Similar to larger construction projects, the students found getting the work done in the end and completing the punch list an arduous task. Students learned the importance of creating a detailed and accurate schedule and sticking to it. One group built a fence, installed the landscaping, and then painted the fence. If they had just stuck to the original schedule, it would not have looked like it had snowed on the vegetation.

Consensus

Much has been written on the subject of service-learning as it relates to construction management education. A review of our own Associated Schools of Construction (ASC) Proceedings and International Journal of Construction Education and Research reveals several manuscripts related with this subject. Much of the material and views contained in this paper are supported by others. Bolivar Senior emphasizes in his paper the need for “a lecture session devoted to reflecting about what was learned from the project. This reflective analysis proved to be crucial for the internalization of the experience, and to put its importance in perspective” (Senior, 1999, p.21). Audrey Tinker and Michael Tramel article documents three successful construction management service-learning courses which espouse the aspects of volunteerism, hands-on experience, and community pride (Tinker and Tramel, 2002). Kevin Burr and John Martin discuss how traditional assessment tools are ineffective when applied to construction service-learning education and the need for “a compilation of diverse data collected from several triangulated sources” to give accurate feedback and objective evaluations (Burr and Martin, 2003). Stuart Bernstien’s article reflects on taking “the time to find the right project, determine the outcomes and goals desired for the students ahead of time, and create an interdisciplinary team to make the experience even more worthwhile and exciting” (Bernstien, 2006, p.8). Finally, David Batie’s article addresses the “apparent disconnect in teaching/learning” which can help be mended by integrating service-learning into a construction class (Batie, 2007, p.1).

Conclusion

Being a faculty member at a university brings with it a tremendous amount of responsibility and opportunity. We are influential members of one of the largest employers typically in the community. We have the ability to persuade hundreds, even thousands of potential volunteers toward an endeavor of our choosing. We can solicit and raise funds which can be applied toward any particular venture. We are in a unique position to affect change and direct resources toward worthwhile causes. You may have never thought of yourself as a community organizer, but here you are reading this paper and pondering service-learning. Many faculty members today may see themselves solely as educators. Service-learning stretches us to be a little bit more. This is not an easy task for faculty: “it’s hard to build community when you are a professional gypsy” (Stanton, 1999, p.149). By redirecting resources, fundraising, motivating students, and working with the community, we take ourselves out of our element.

Service-learning programs need consistency as well as a champion for both the students and the community to rely on and rally around. Student populations will roll through the curriculum every four or five years, with most only truly active in their last two years. Faculty need to be supported in taking action which stretches the capabilities of themselves and their students. Great learning occurs when students are put in situations outside the curriculum norm, situations which make them a bit uncomfortable and challenge them in new ways. The service-learning model is not the only way to achieve these goals. Any type of experiential-learning will have similar impacts. The style of learning selected depends on an assessment of one’s curricular needs and requirements of the students. More work is always needed to perfect these programs, but everyone should be encouraged to think outside the usual curriculum box.

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I would also like to encourage anyone who is interested in the topic of (or related field of study in) service-learning, cooperate volunteerism, or experiential education and how it applies to construction, construction management and construction education to please contact me to share ideas or experiences at: plbarlow@calpoly.edu.