



Engaging Student Learning Through Public Service Projects

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Abstract

As part of the learning experience at the University of Maine, students across the university are encouraged to volunteer in the greater community. In fitting with this mission, the student professional groups of the Associated Builders and Contractors (ABC) and the Associated General Contractors (AGC) have executed several public service projects for non-profit groups in our greater community. This paper presents anecdotal information on several of these projects and the benefits of working within the community. The construction management technology students who have been involved in these projects have developed a greater appreciation for working within the community to assist non-profit clients with needed improvements.

Introduction

The University of Maine is a land grant institution founded in 1865. It serves the people of the State of Maine under a threefold mission: teaching, research, and public service. As with most universities, UMaine has an excellent track record in teaching and research and is a leader in many academic disciplines. The University of Maine is somewhat unique in that there is a dedicated volunteer services department, the Bodwell Center, that encourages students to volunteer in the greater community. UMaine has a service project day for all incoming freshmen and sponsors a system wide volunteer day at the end of the spring semester. On this volunteer day, classes are cancelled and students are given opportunities to volunteer. Throughout the academic year, students can volunteer through the Bodwell Center in a variety of activities from discrete projects to long term continuing services. The active commitment of the University to encourage volunteerism has been and continues to be a long term endeavor.

Engineering education is an integral part of community service throughout the United States. Many engineering programs actively engage in service-learning as part of their respective curriculums. The spirit of community service is articulated in several of the “learned capabilities” established under ABET criterion 3B:

- e. an ability to function effectively as a member or leader on a technical team
- h. an understanding of the need for and an ability to engage in self-directed continuing professional development
- i. an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity
- j. a knowledge of the impact of engineering technology solutions in a societal and global context
- k. a commitment to quality, timeliness, and continuous improvement

Through community service programs, engineering students will play a more effective part in the development and improvement of the American way of life.
community service in construction

Several engineering programs engage in community through service learning. These programs follow a structured format in developing community service. Barrington and Duffy summarize what service learning is through definition:

There have been many definitions for service-learning in the literature over the years [e.g., (Jacoby, 1996), (Bringle, Hatcher, & Games, 1997), (Stanton, Giles, & Cruz, 1999), (Learn and Serve America, 2009)]. One of the earliest definitions is still widely accepted and comprehensive: Service-learning is a “a course based, credit-bearing, educational experience in which students (a) participate in an organized service activity that meets identified community needs and (b) reflect on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of civic responsibility.” (Bringle & Hatcher, 1995). Note the three elements. To be defined as service-learning the activity must be in the context of a credit-bearing course, meet a real community need, and involve a reflection component.¹

Volunteerism is a different form of community engagement that requires dedicated individuals to complete the necessary tasks. This level of engagement instills a sense of duty in individuals and continued expectation to provide service. These are values that can continue in a lifetime as is implied by ABET 3B, e., i., h., j., k. Unlike service-learning, volunteerism doesn't include a credit-bearing course so the commitment is not through academic incentive. There is no organized activity defined for educational goals. Volunteerism is active involvement to provide an ultimate outcome. Students need to work with a client to decide the outcome and figure the best way to achieve that outcome. The solutions are not always straight forward and require some trial and error attempts to complete.

Construction management students at the University of Maine take a variety of courses to help prepare them to manage construction projects. The classroom provides the backdrop for technical and management skills, but cannot provide practical experiences with “people skills” such as leadership, organization, and customer relations. Because of resource limitations, faculty is not able to create service learning experiences as generally reported at other institutions. Recognizing the need for students to engage in the greater community, faculty encourages and assist members of the student professional groups of ABC and AGC to volunteer their respective talents to local non-profit organizations. Several of these non-profit organizations do not have the expertise, manpower or ability to hire the manpower necessary to perform some of the needed capital improvement projects at their facilities.

In the past 5 years, several construction management technology students at the University of Maine have volunteered numerous manhours to complete projects at a variety of non-profit organizations. Faculty members have assisted students in making contacts with the respective organizations requesting manpower. Because of the logistics of these projects, organizations are asked to purchase the necessary supplies needed to complete the projects. This paper will discuss some of these projects within the context of outcomes and lessons learned.

First non-profit; long term student client

The Good Samaritan Agency was founded in 1902 to provide social services to unwed mothers. Through the years, the mission of the agency has evolved to adoption services, alternative education to parenting teens, and daycare services. The Agency occupies a new building, built in 1999, in a professional office park area of Bangor, Maine. This building was professionally designed and built through a volunteer construction manager who contracted for the most economical services. Several amenities were not included in the original contract and continued maintenance was not planned for the facility.

Construction management students have performed several community service projects at the facility that required design, procurement of materials and equipment, and physical manpower. These projects have saved the Agency several thousand dollars and have greatly improved the facility.

The building is divided into thirds with a state licensed daycare at one end, social services in the center, and alternative education spaces at the other end. As part of the licensing requirements, safe egress is needed for infants and toddlers from the facility in the event of emergency. Requirements include that these children be placed in wheeled cribs, three in a crib, to be pushed in the cribs out of the facility. The original building had door stools of about 18" to the native ground surrounding the building. Licensing regulations also require that wood chips cover the adjoining playground area instead of sands, grass, and rocks. Pushing wheeled cribs along a wood chip surface is very difficult. Students devised plans for ramps from the facility and built these ramps in the late fall. This facility is in a seasonable freeze-thaw area and additional design included frost action prevention to minimize movements. Students developed a materials and equipment list for the project and the agency paid for the items. The project was completed in three Saturdays in October and November. The cold weather endured. The agency was very pleased with the outcome.

The following year, the ramp project was continued with a built walkway across the wood chip playground. Students needed to design the walkway to minimize seasonal shifting at an economical cost. It also had to be completed once started to minimize the impact on the daycare services that uses the playground. Students spent two days clearing the area, preparing the site, and laying the blocks. Students procured all of the materials needed and scheduled delivery as needed. This walkway provides the support needed for pulling the wheeled cribs from the site to safety. It has the added benefit of providing a play surface for children's riding toys.



Students have completed several other projects including painting several rooms, painting exterior surfaces, pulling electrical wires through the wall cavities, and recently assembling 12 cribs for the daycare area.

Second client; capital improvement project at municipal facility

As part of their United Way commitment, a local contractor approached the construction management program to see if a student group would assist in putting together a recreational trail for the local municipality's parks and recreation department. The contractor would supply all of the materials and any equipment that the students would need in putting together the trail. One student stepped forward to coordinate the effort and in consortium with the local parks and recreation director developed a design and put together a materials and equipment list. This student solicited volunteers and coordinated time for the project. Original plans were to complete the work in one day and to do this project on the University's system wide community service day.

On the designated day, a steady rain hit the project. The volunteers started the project and roughed out the path, cleared the general area of sod, and began laying the crushed stone materials. Because of the eventual scope of the project, volunteers continued the project for 3 additional work days and completed a large scale project using mechanized equipment, several volunteers, and saved the community considerable cost in labor and materials.



Several of the students who volunteered at the project were hired for both summer and full time employment with the sponsoring contractor. The contractor allowed students to use the equipment and learn through trial and error.

Client three; a sign and painting at a local museum

The last project discussed in this paper is a local non-profit historical museum. The local museum is located in a former church facility in Old Town, Maine. The museum has very limited resources to maintain an older building and facility. Some of the exterior amenities of the museum had fallen in disrepair and the regular volunteers at the museum had no ability to make the repairs. A student group volunteered their services and built a new event sign and repaired and painted deteriorated front concrete entrance steps. Students estimated the amount of materials needed, they built the sign, and repaired the steps. This work was done in a day and again saved the client a lot of money for manpower.



The museum saved in excess of \$5000 for the project. They had been quoted a cost of \$6000 for a new sign. Materials for the sign cost around \$600 and concrete paint and grout was around \$100. The board of the museum was very pleased with the final projects.

Lessons learned

The use of volunteer labor through student engagement has many benefits that students will hopefully carry with them through their professional careers.

1. Developing practical solutions at the most economical and beneficial use of the client. Non-profits and public sector entities have constrained budgets that must maximize their financial inputs. There is no ability to expand the budget. The project will be used by many for an extended period of time and will be visible.
2. Leadership is difficult in volunteerism. People do not receive compensation and are motivated differently. Coordination of people can be difficult and commitment may be limited.
3. Clients have an idea as to what they want, but limited knowledge on how to achieve it. They need to have input into the process.
4. Time is critical in completing a committed project. Many non-profits have working facilities that serve a clientele. Proper planning is needed to minimize disruption of the services.
5. Scope creep is a reality. The client may want more than is budgeted and may expect more than can be delivered. Volunteer teams need to know what is practical and place constraints on the project from the beginning.

Conclusion

Volunteerism is a vital part of an engineer's training. It allows volunteers to enhance their training by working both in a technical and non-technical arena. Budget and schedule dictate the practical levels of project delivery. Student volunteers have to interact with clients that provide public services with limited resources. Volunteers operate under different motivations than paid or compensated employees. Commitment to community by trained individuals will enhance the ultimate environment that we all enjoy.

Bibliography

1. Barrington, L., and Duffy, J., 2010, *Maximizing Benefits of Service-Learning in Engineering*, Proceedings, ASEE Louisville, KY 2010.
2. ABET 2013-2014 *Criteria for Accrediting Engineering Technology Programs*