Institutionalizing Service Learning

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Abstract **- Service learning is the combination of a structured educational program and service to the community. For engineering and technology students, it is often project based and requires a real user customer for the project. Finding these users was the intent of a service learning project at Purdue University during the two regular semesters of 2005. The objective was to build an Internet accessible database containing all of the non-profit organizations in Howard County, Indiana, USA. In the first semester, students compiled the demographic information, completed a needs assessment, designed the database, and completed the interface programming. In the second semester, students were able to install the computer servers with the database and interface programming and also to complete several of the projects returned by the needs assessment. The installation of this service learning database is thus a showcase that allows others to see what students can do, and as a portal for others in the region who are interested in putting more service learning projects into their curricula. It is hoped that this will aid in institutionalizing service learning in the curricula.**

Index Terms – Active / cooperative learning, experiential learning, service learning.

INTRODUCTION TO SERVICE LEARNING

While there are several definitions of service learning, one that is often used is from the National Service Learning Clearinghouse. It states that service learning is "a teaching and learning strategy that integrates meaningful community service with instruction and reflection to enrich the learning experience, teach civic responsibility, and strengthen communities."[1] In other words, service learning goes far beyond just service or volunteerism. To use some common examples, students could either individually or as a group pick up trash along a streambed, plant trees, or repair the home of a disabled individual. All of these are valuable services to the community as a whole, and are part of the concept of volunteerism. They are not, however, service learning, even if the activity is part of a school project. For it to become service learning several other items must also apply. First, it must be connected to the education objectives of the program of study, and the students must have been prepared for doing the tasks required. Next, the recipients of the services must become active partners in the process. This adds the aspect of communication with the user / client. Some form of reflection upon the experience by the students is also required. This allows the students to construct a conceptual model of how the experience fits into their learning. Using one of the examples above, if the students involved in the streambed cleanup also analyzed what they found, shared these results with those in the neighborhood, worked with those in the neighborhood to reduce further pollution, and submitted a written reflection upon the experience, it would then become service learning.

For students in the engineering and technology areas, service learning allows the application of technical skills learned in the classroom to a real problem faced by the community. This could include water quality analysis in a stream, the design of a park or green space, or the construction / reconstruction of a home. Along with the required technical skills, though, comes the need for soft skills such as teamwork, empathy, and communication. Thus it is a holistic approach to learning that connects and engages the student to the broader community outside of academia, and hopefully also develops a sense of civic responsibility within the student. These are all worthy attributes, and while they are valuable, they are not enough. For service learning to become more widespread, it must be proved that it is a viable pedagogy that works to improve learning. At that point, the introduction of service learning courses into the curriculum will become much easier. Furthermore, service learning needs to become institutionalized in such a way that course instructors will be supported in their efforts by their organization. Quite simply, when students interact with real users in a real project to solve a real problem, additional work is required by the instructor. This includes the work of finding the users and projects, and handling the problems that arise during the semester. When these problems occur, the idea of using the standard canned case study approach can look very attractive to the instructor.

THE ROOTS OF SERVICE LEARNING

Since service learning is a type of experiential learning, its western roots could be traced back even to the apprenticeships of medieval guild systems. This type of active learning, of learning at the same time as doing, is still with us in many modern day union apprenticeships. A more likely beginning for any North American university service learning history could probably be the First Morrill Act of 1862. This act, done by the United States government, allocated land-grant funds for "the endowment, support, and maintenance of at least one college where the leading object shall be, …, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the States

may respectively prescribe, in order to promote the liberal and practical education of the industrial classes on the several pursuits and professions in life."[2] This mission of the land-grant colleges such as Purdue University has led directly to such things as extension services to residents and 4-H programs for youth, meaning that portions of the University have had a long history of engagement with the population of the state. Another root of service learning could be found in the cooperative education movement. Both are based in the idea of practical application, with cooperative education being defined as "the formal integration of classroom theory (academic education) with work experience (practical education). This method of education was designed to expand, enhance, and enrich the student's college academic training."[3] While generally accepted now, cooperative education was not strongly supported in its beginning at the University of Cincinnati in 1903.

The term service learning was first used in a project by the Tennessee Valley Authority (TVA) in 1966. The TVA linked faculty and students with area development organizations so that they could work together on projects. This was one of a number of government programs in the 60's and 70's that aimed to increase volunteerism and service, including Volunteers In Service To America (VISTA). Another big year in the development of service learning was 1985, when a small group of university presidents formed the National Campus Compact. Its mission was to develop the citizenship skills of students though service to their communities. Campus Compact has now grown to "a national coalition of more than 950 college and university presidents - representing some 5 million students - dedicated to promoting community service, civic engagement, and service-learning in higher education."[4] One of the connections of service learning to engineering was made in 1995 when the Engineering Projects in Community Service (EPICS) program was founded at Purdue University. Like the Campus Compact, EPICS has grown to other universities and now has many ongoing projects.

While the concepts of service learning have certainly been known for some time, it is only recently that it has become common in the engineering and technology education literature in North America. For example, a survey was done of paper titles from the American Association for Engineering Education (ASEE) Annual Summer Conference for the last 10 years. After a search of papers with "service learning" in the text of the paper, a check was done of how many papers actually had the word "service" in the title. It showed a major increase over the last 10 years.

TABLE I
ASEE SUMMER CONFERENCE PAPERS

Year of Conference	Number of Papers with "Service" in Title
1996	1
1997	2
1998	1
1999	0
2000	9
2001	5
2002	7
2003	1
2004	9
2005	14

For this trend to continue, however, service learning must be viewed as value added within the engineering and technology programs of study.

The literature supports this view. Areas mentioned include teamwork, motivation to complete a "real" project, and the adaptability of service learning projects to multiple engineering curricula.[5][6] A basic problem with service learning is reported as "incorporating a collaborative service-learning project in a course can be extremely difficult and time consuming. Part of the reason for this is that a service-learning project is rarely repeated from semester to semester."[7] However, student evaluations can be outstanding, as the students see and do real engineering, even in a freshman class.[8] On the other end of the program of study, service learning can also be beneficial for a capstone course for seniors, as long as time allows for reflection of the process.[9]

COMMUNITY SERVICE LEARNING PROJECT

Many instructors have been using live case studies for many years, even though the projects have not been called service learning. One problem with this approach was that a new client or clients had to be found every semester, since, if the project was successful, the current client would be satisfied. For instructors at an extension site, there was the additional problem of being physically separated from their departmental colleagues in the main campus. Most projects, including EPICS, were centered in that county. To try and work through this problem, two professors at an extension site, one from the department of Organizational Leadership and Supervision (OLS) and one from the department of Computer and Information Technology (C&IT), proposed and received a 2005 grant from the Community Foundation of Howard County to implement a service learning project on the Kokomo campus of Purdue University's College of Technology. The project's objective was the development of an online database containing all of the non-profit organizations in Howard County along with possible project information. It was hoped that in addition to having the online database with contact information, merely by completing the project additional connections would be made to the non-profit service community by faculty and students.

The first part of the project was headed by an OLS student taking OLS 467, a supervised practicum course number which is used for service learning courses within the OLS department. Working under the guidance of the OLS professor, the student worked on compiling the name and address information of all non-profits in the county, which ended up being over 300 organizations. These included service groups, religious groups, clubs, and economic development corporations. The organizations were then sent a needs assessment asking for ideas of how Purdue University students could help them via service learning projects. Twenty six organizations responded with requests including

grant writing, marketing, policy manual development, and various computing needs. As the student was working on these tasks, she also became the primary user for three C&IT classes that were using the service learning project as their case study. One of the classes used the project as the case to model information technology needs using the Unified Modeling Language (UML). A second class used these models to create a database in Oracle, while the third wrote Java programs to clean the data and implement the user interface. At the same time, the C&IT professor wrote the curriculum document needed to create a Supervised Practicum course in the C&IT curriculum. Courses already existed for cooperative education and both group and individual senior design project courses. However, none existed for a supervised practicum course that could be taken by C&IT students in their junior (3rd) year of study. This course was approved by the faculty at the department and college level and approved as C&IT 390.

During the fall 2005 semester a first group of four students enrolled in C&IT 390. Their first task was to try and implement the database. After some delay, security concerns prevented them from being able to host the database on university servers, so private funds and servers had to be acquired by the students. This also necessitated rewriting the database and interface software so that it was completely open source. During this delay, the students were also trying to meet some of the computing needs that had been returned via the needs assessment. Several projects were selected, including the creation or reworking of a volunteer / contributor database and installation of computer network hardware and software for use in an after school tutoring program. Of the projects selected, the user base turned out to be very diverse. Some clients were extremely timely, making sure that they were present for meetings and that orders for hardware, software, and phone line installation were completed. Others, however, were not so timely, and had to be dropped from the work list as needed items would not available until after the end of the semester. Since the projects were in a constant state of change, communication was very important between the students and instructor. This was accomplished with a combination of posted meeting minutes, e-mail, and online discussion board threads. In the end, four projects were completed, three with great success. Another three projects were carried over as class projects for regular classes in the spring 2006 semester.

CONCLUSION

At the end of the semester, evaluations were completed by both the clients and the students. The client evaluations of the students and their work were very favorable, as well as student evaluations of the clients and the course. However, problems did exist. First, the Internet hosting issue delayed implementation of the live database, and caused an amount of rework. Second, unlike a contained case study, neither the students nor the instructor has control over the real clients'

actions. This caused a number of delays in the projects. The result was that business decisions had to be made if a project was not going to be completed on time, and three projects had to be dropped because of the delays. Overall, however, the service learning database project could be considered a partial success. The database was built, it is online, and several projects were completed. Delays in implementation, however, have meant that the database is not completely operational. Learning by the students was accomplished, as the students involved had many real-life experiences which will help them deal with real users in the future, and also built contacts within the community. During the fall 2006 semester a new set of students will complete additional work on the database and additional client projects will be selected for implementation. The long range goal of this activity is to institutionalize service learning as an engagement method for the College of Technology by having an on-going source of contact information and projects available to faculty and students.

ACKNOWLEDGMENT

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