



# Opportunities for Service-Learning Partnerships in the Information Systems Curriculum

Dr. Jonathan Lazar and Dr. Doris Lidtke

Department of Computer and Information Sciences, Towson University, 8000 York Road, Towson, MD 21252 USA  
Phone: 410-704-2255 (Lazar), 410-704-2981(Lidtke), Fax: 410-704-3868, E-mail: (jlazar, dldltke)@towson.edu

## ABSTRACT

*Service-learning partnerships involve students taking part in community service that relates to their academic course experience. Students who major in information systems are increasingly being provided with real-world experiences. These real-world experiences offer numerous benefits. Students can immediately apply their course knowledge to real-world situations. Students can get the experience of grappling with political, social, and ethical issues in a workplace setting. In addition, students can develop a sense of civic responsibility, by contributing their skills to their communities. This paper presents the issues involved in implementing the service-learning paradigm in an information systems curriculum. Examples of successful service-learning courses are presented, and new possibilities for service-learning courses are discussed.*

## INTRODUCTION

Courses in the information systems curriculum are increasingly incorporating hands-on experiences for students. Student evaluation is no longer limited to exams and research papers. Projects are becoming an increasingly common part of the Information Systems curriculum. It is one thing to describe to students how an information system is developed, modified, or maintained. It is a totally different experience for students to experience first-hand an information system being developed, modified, or maintained. If the students can work with real users in a real-world experience to develop an information system, this is a valuable experience. The question is how to place students in an appropriate real-world setting. An educational paradigm called service-learning would seem to be appropriate for forming a partnership. In service-learning, students take part in community service experiences relating to their coursework (Jacoby, 1996). This paper will discuss opportunities for implementing the service-learning paradigm in the information systems curriculum.

## SERVICE-LEARNING

Service-learning is an educational paradigm in which students take part in community service (Jacoby, 1996). This community service is structured to relate to course material, with the goal of strengthening the course experience. The idea is that the service-learning projects offer an opportunity to immediately apply the material learned in the classroom. Instead of simply discussing the concepts in a classroom setting, students get a chance to use their knowledge to assist others (Jacoby, 1996). While gaining experience working in their community, students also strengthen their sense of civic responsibility. Service-learning can provide a strong educational experience for the students involved.

Community-based non-profit organizations are in need of assistance with technology. Non-profit organizations tend to have smaller budgets for technology, and therefore cannot afford to hire many people to work on their technology needs. For instance, schools frequently cannot afford to provide Internet training for their teachers (Lazar and Norcio, 2001). In some cases, schools might be required to spend their technology budgets on capital expenses such as hardware and software, instead of developing new resources or managing existing resources or providing training (General Accounting Office, 1998). Other non-profit organi-

zations, such as parent groups, and support groups, usually are dependent on donations of money and time to effectively utilize technology. Groups of technology workers may come in on a Saturday to wire a school for the Internet. Professional user groups may take donations of old computer equipment, refurbish and upgrade the computers, and then donate the now-functional computers to non-profit organizations in the local community. Many community groups are dependent on the goodwill of their local citizens to effectively use technology.

Service-learning is a useful technique for incorporating real-world experiences into the curriculum. Local community groups are in need of assistance with technology. Students are in need of real-world experiences that relate to their course material, because they gain a better understanding of user issues only by working with real users (Lazar and Preece, 1999). By getting real-world experience, students can get a sampling of the ethical and political issues that can occur in a workplace (Lazar & Preece, 1999). Through their real-world projects, students may also make contacts, and develop professional networks that can help them in their careers (Shneiderman, 1998). In addition, students frequently assume that implementing an information system consists simply of programming. By going through the complete development lifecycle, working with users to gather requirements, develop a system, and then implement that system, students can see that there is much more than coding involved in information systems development.

Although service-learning is traditionally used in conjunction with classroom-based courses, service-learning could also be implemented as a co-op or internship program. Students can apply their knowledge from a number of different classes, to assist a non-profit organization with their technology needs. Of particular value are internships which allow students to be involved in the complete process of analyzing, designing, implementing, delivering, and maintaining a system. Alternatively, students can learn a great deal from in-depth immersion in one or more of these development phases.

There are many other advantages of service-learning. Students can "learn to learn," meaning that they learn new technologies, new techniques, and new programming languages in real-time, in the workplace. In a service-learning placement, students can learn the importance of documentation, an appreciation for which is not easily motivated in the classroom. By working with

others in a real-world setting, students can develop the skills needed for successful teamwork. By seeing a variety of information technology positions available within an organization, students may have a better grasp of their area of interest, which can assist students in choosing elective courses to complete their degree program. Students gain valuable experience to help them prepare for their professional career. And when students have completed their degree requirements, their service-learning placements can be used as a “portfolio” of work, to show their level of competence (Lazar, 2000).

## REQUIREMENTS FOR A SERVICE-LEARNING COURSE

An information systems course using the service-learning paradigm is appropriate for juniors or seniors who have a thorough understanding of the issues involved in the process of developing an information system. It is by no means appropriate for freshman or those new to the information systems major. Many new students tend to think that developing an information system begins with sitting down and coding. In reality, a long process of analysis and conceptual design first takes place. Because this understanding is necessary for a successful service-learning placement, a good prerequisite for a service-learning course would be either a basic **Systems Analysis and Design** and/or **Project Management** course. Both of these courses involve the process of developing an information system, as well as the issues (political, legal, user, financial) that can arise when building an information system. With this knowledge base, students are qualified to enter an organization and build an information system.

Good community partners are a requirement for a successful service-learning experience. Ideally, these partners should be non-profit organizations. Non-profit organizations, which generally have smaller technology budgets, are frequently unable to afford assistance with their technology needs. These non-profit organizations are ecstatic to have bright students to assist them, and the students are welcomed with open arms. The students feel that they are wanted, and that they can make a difference. This makes for a very positive experience for the students. In one service-learning placement, the non-profit organization was so happy to have the students there, that the contacts in the non-profit organization hugged the students every time that they came for a client meeting, and baked cookies for the students to thank them for all of their hard work. Good community partners are essential to the service-learning paradigm, because if the clients do not find the time to meet with the students, the service-learning project cannot be successful. At the same time, students must understand that they have made a commitment to the community partner, and students must live up to their end of the bargain. Feeling tired or partying the weekend before is not an excuse for late work in the workplace, and neither is it acceptable in a service-learning project. Service-learning mirrors the responsibilities that students will face when they enter the workplace after graduation.

## SERVICE-LEARNING EXAMPLES

The following section will describe some of the possibilities for implementing service-learning in the information systems curriculum:

### Web Design

As part of the requirements for a web design course, students can develop small web sites for non-profit organizations in the community (Lazar, 2000). In such a situation, the students must learn about both the web design process, as well as web pro-

gramming, such as HTML and JavaScript. Alternatively, students could learn more about web design applications, such as FrontPage and Dreamweaver. For this service-learning approach to be successful, students must have both the tools to build web sites, as well as an understanding of the development process (Lazar, 2000). Students can go through the full lifecycle of analysis and design, by determining user requirements, developing a web site, and then testing and installing a web site. In addition, students can also re-design currently existing web sites, which can give students experience in maintaining information systems, a topic which is frequently left out of analysis and design courses.

### Database Design

Students in database classes can apply their knowledge to help community-based organizations manage their data. Jimenez (1995) describes a class where students analyzed, designed, and implemented a database for a county department of health and human services. This relational database stored resources available related to child care (Jimenez, 1995). The students performed an analysis, developed entity-relationship diagrams, designed a relational database, and then implemented the database in Windows-based software database application. Users were involved in the development process, and functionality and usability testing were performed. Students also learned the importance of project documentation (Jimenez, 1995).

### Computer Applications

Many universities offer courses dealing with computer applications such as word processing, spreadsheet, and database. These courses tend to be at the 100-level or 200-level. Although word processing is a popular tool, many employees in non-profit organizations are not as familiar with the powerful features of spreadsheet and database software. As part of their course requirements, students could assist non-profit organizations in developing databases of members or mailing lists, or in developing spreadsheets for tracking finances. Because students only receive very basic training in using these software tools, these projects might be relatively small, but they can give students a good introductory experience of working with users. These types of projects would also tie-in very well with business classes such as marketing and accounting. These courses typically enroll students of freshman and sophomore rank, so it is essential to make sure that the students are well-equipped to operate in a workplace, and understand the systems development life cycle, before sending the students out for a service-learning experience.

### Online Communities

Online communities are network-based resources where people with common interests can go online to communicate (using listservers, bulletin boards, etc.) and share resources (Lazar and Preece, 1998). An online communities course is offered where students examine and develop online communities. In the service-learning approach, students talk to non-profit organizations and determine where there is a need for an online community. Students then build or re-design online communities for groups such as parent support groups, local schools, neighborhood associations, and others who want to utilize an online community (Lazar and Preece, 1999). The students become familiar not only with the software tools for building online communities, but also with the user considerations in building an online community (Lazar and Preece, 1999).

### Business Process Redesign

A graduate course in business process redesign (BPR) included a community partnership, where students worked in a local organization to help redesign business processes. The course objective was to teach BPR concepts and techniques (Kock, 2000). The instructor decided that the most effective way for students to learn about BPR was to redesign business processes for a local company (Kock, 2000). The specific IT processes to be redesigned included help desk call response, new employee account set-up, and asset management (Kock, 2000). Although this partnership involved a for-profit company, this same course approach could be used for a non-profit organization. By the end of the course, students had created three deliverables, describing the analysis of the current processes, possible IT approaches for process redesign, and cost/benefit analyses of the different implementation plans (Kock, 2000).

### Senior Capstone Course

Many information systems programs include a “capstone” course at the end of the program. These courses tend to synthesize the knowledge gained in other courses, and therefore, these courses are very appropriate for service-learning partnerships. Students can utilize skills gained in other courses, such as programming, database design, systems analysis and design, and networking. The type of service-learning project (database, programming, web design, etc.) may change, based on what the needs of the community-based organization are. The service-learning project could involve programming skills, software skills, networking skills, and/or database skills.

### Networking

It is possible that students in networking courses could assist non-profit organizations in implementing local area networks. Frequently, non-profit organizations such as schools cannot afford many of the costs associated with implementing computer networks. Students could help in the network planning stages, the physical wiring, or the implementation of working networks.

## THE EFFECT OF INFORMATION SYSTEMS ACCREDITATION

Accreditation has long been a strong component of Computer Science programs, through the Computer Science Accreditation Board (<http://www.csab.org>). Accreditation efforts in Information Systems have increased, and it is expected that accreditation will play a major part in information systems programs in the future. Accreditation teams are focusing on the goals and objectives of Information Systems programs, and then determining whether the programs are meeting their stated goals. Service-learning projects can be helpful in program assessment, by showing

how well students are able to perform in real-life situations. Real-world projects completed by students can demonstrate that students, upon completing a program of study, have mastered the subject material and are able to apply their knowledge in a real-world setting to solve real-world problems. Successfully completed service-learning projects can be an additional outcome measure to evaluate the effectiveness of the curriculum in an IS program. More information about IS Accreditation is available at: (<http://cis.bentley.edu/ISA/>)

### SUMMARY

Service-learning, when implemented appropriately, can be a good paradigm for information systems courses. Students can gain experience working in real-world settings with real users. These service experiences can help students determine which career path is most appropriate for them. At the same time, local community organizations get assistance with their technology needs, which they otherwise could not afford. Service-learning has successfully been used in courses such as web design and database design, and it could be appropriate for other courses, such as networking and senior capstone courses.

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