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Implementing Service-learning to the Information Systems and Technology Management Program: A study of an Undergraduate Capstone Course

Kangning Wei

Jane Siow

School of Information Studies
Syracuse University
Syracuse, NY 13244, USA
kwei@syr.edu jsiow@syr.edu

Diana L. Burley

Division of Undergraduate Education
National Science Foundation
Arlington, VA 22230, USA
dburley@nsf.gov

ABSTRACT

Service-learning has been identified as an extremely valuable educational tool and applied to different disciplines and areas, but literature review on service learning has indicated that service-learning is little used in Information Systems education. This paper presents our design and development of a service-learning capstone course for graduating college seniors enrolled in an Information Systems and Technology Management program. A conceptual model is proposed to guide the implementation of service-learning into such a course. Following this model, we discuss our experiences and reflections on designing the course and particularly, how to assess students' performance.

Keywords: Service-learning, Information Systems, Technology Management, Capstone Course

1. INTRODUCTION

Interest in developing linkages between academia and practice has been longstanding in certain fields, with such interest driven by employers' growing demand for relevant workplace skills of new graduates and potential employees. Service-learning is such an educational strategy that combines classroom-learning experience with community service experience. It requires that courses are modified to involve real projects from communities and thus provide students with real-world experiences in a relatively safe academic environment (Wilcox and Zigurs 2003). To date, service-learning has been identified as an extremely valuable educational tool and applied to different disciplines and areas such as nursing education (Sadla et al. 2003), literacy learning (Clark 2002), computer science and engineering (Linos, Herman and Lally 2003), teacher education (McKenna 2000) and business (Gujarathi and McQuade 2002), but literature also indicates that service-learning is little used in Information Systems education (Johnson and Johnson 2005).

Service-learning is particularly relevant in the information systems and technology management (IS&TM) field, which continues to grow in complexity and hence demand for experience. As IS&TM increasingly constitute the core if not mission critical operational aspects of organizations, the need for practical skills and experience becomes even more crucial. Educators have an important role in keeping course material relevant and applicable to practice so that students gain not only theoretical understanding of IS&TM issues but also opportunities to put knowledge into practice. Another concern about IS&TM is that it is not inconceivable for cutting edge skills to become irrelevant in a few years. There is also a perceptual gap between the IS&TM skills gained in an educational settings and what are practicable or applicable in real-world settings. As students face challenges in adapting to change and reconciling classroom knowledge with needs in practice, uncertainties understandably remain as to whether knowledge mastered in class will still be valued by the time they enter the workplace. In such a complex environment, it is all the more imperative to supplement classroom learning

with exposure to real world settings where judgment and thinking skills can be tested.

This paper presents our development of a capstone course for graduating college seniors enrolled in an IS&TM program, focusing particularly on our experiences and reflections on incorporating service-learning into the program.

The paper is organized as follows: section 2 presents a selective literature review of service-learning, by focusing on the critical success factors for service learning and current status of service-learning in the IS&TM field. A conceptual model to guide our process of implementing service-learning to an undergraduate course in the IS&TM field is proposed at the end of this section. Section 3 describes our experiences and efforts in developing such a course. The paper concludes with brief discussion of feedback on the course and a discussion of the various key challenges and lessons learned from our experiences.

2. LITERATURE REVIEW

The concept of service-learning is not new; it was coined in 1967 to describe the educational practice and philosophy of integrating classroom concepts with a related community service experience (Sanderson 2003). However, despite its establishment in practice, there is still no uniform agreement on the definition of service-learning due to perceived differences in focus and emphasis between "service", "learning", and "service and learning" (Sigmon 1996). Most definitions focus on the student learning perspective. For example, one of the most cited definitions cites service-learning as a process where "... students engage in activities that address human and community needs together with structured opportunities intentionally designing to promote student learning and development" (Jacoby 1996). No matter what the definition is, service-learning should emphasize three purposes: strengthening student learning, benefiting the community and focusing on issues of social justice, culture and society as a whole (Saulnier 2003).

Literature on higher education presents numerous examples of projects of service-learning in different fields that demonstrate its positive effects on students, educators and communities. In the main, the benefits include enhancing students' motivation and enthusiasm for studying (Sanderson and Vollmar 2000; Zlotkowski 2001); facilitating students' understanding of course materials (Traynor and McKenna 2003; Johnson and Johnson 2005); fostering more active civic awareness and social citizenship by enhancing students' cognitive, affective, and ethical perceptions (Giles and Eyler 1994; Butin 2003; Guthrie and Navarrete 2004); promoting an ethos of community engagement among educators (Butin, 2003), and facilitating community clients in the application of new technical and management knowledge as well as innovative ideas (Alexander 2001; Reid and Slazinski 2003).

Our survey of the literature indicates that service-learning is well-established in fields with a strong human component, such as the social and behavioral sciences, social work, education, human ecology and agriculture (Traynor and McKenna 2003). Introduction of service-learning as a core component of IS&TM education however remains

relatively new. As a case in point, as of November 2004, the National Service-Learning Clearinghouse resource list (<http://www.servicelearning.org>) contained no entries for syllabi or curricula under IS&TM. An extensive literature review on service-learning only identified a few articles on applying service-learning concepts to IS education (Lazar and Preece 1999; Wilcox and Ziguers 2003; Guthrie and Navarrete 2004; Johnson and Johnson 2005). While we recognize that many IS&TM courses do include real-world examples, we suggest that a comprehensive approach that directly applies service-learning concepts to the field will not only enable students gain better understanding of user issues, acquire critical professional skills and enhance technical skills, but also provide communities with new tools and techniques for more efficient operations, outreach and access to opportunities for their constituents. These needs in turn translate into a relegation of responsibility for the design of training and practice exposure to educators, thus reinforcing the case for integrating service-learning in IS&TM courses and programs.

Since community involvement is central to service-learning courses, service-learning course design is different from traditional course design. Wilcox and Ziguers (2003) provide a review and synthesis of critical success factors for implementing service-learning, which includes necessary reflection or feedback, reflection by all stakeholders, grading on actual learning, careful project selection, relevance of the project, partnership between stakeholders, optional involvement, balanced interests of all stakeholders and careful selection of stakeholders. The literature on service-learning also indicates that emphasis has predominantly been on students' engagement in community, civic learning and academic performance. While this speaks to the educational priorities of academic institutions, few service-learning projects explicitly address the issue of achieving balance between the needs of students, educators and the clients or communities. We believe that addressing the needs of all these three groups of stakeholder in service-learning relationships is important in order to attain both the "service" and "learning" objectives.

Based on literature review, figure 1 depicts our model for incorporating service-learning courses in an IS&TM program, with the directional arrows indicating the flow of communication and information exchange between the three groups i.e. educators, students and clients/communities. While service-learning provides students with opportunities to gain concrete experience (arrow 5), the educator's role is to design content and provide structured reflection opportunities to spur student thinking and conceptualizing of knowledge (arrow 1 and 2) (Sanderson 2003). As program supervisors, educators also play an important role in contacting clients for constant feedback (arrow 3) and coordinating the relationship between students and the client or community (arrow 7). In turn, clients engage by monitoring and providing feedback to students and educators on program requirements and students' performance (arrow 4 and 6), thus enabling educators to determine students' progress and learning needs.

Though the idea that the success of service-learning courses should take into account the quality of relationship between students, educators and clients is not new, how to

assess the student learning outcomes has not been widely studied (Wilcox and Zigurs 2003). In this paper, Kolb's experiential learning cycle (Kolb 1984) provides a powerful practical framework for assessing students' learning outcomes. The model claims that the most effective learning requires students' involvement in a continuous learning cycle of concrete experience, reflective observation, abstract conceptualization and active experimentation (Kolb 1984). In the following section, we will describe our efforts in designing such a course in the IS&TM field and in measuring student learning outcomes.

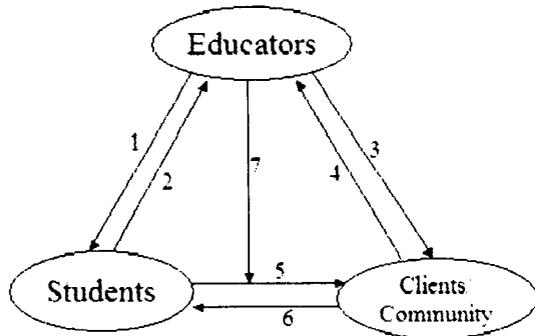


Figure 1. Incorporating Service-learning in an Information Systems and Technology Management Program

3. IMPLEMENTING SERVICE-LEARNING TO AN UNDERGRADUATE COURSE

3.1 Course Development Considerations

Our incorporation of service-learning components into an undergraduate course on professional issues in information management and technology is motivated by several factors. First, the course is aimed at integrating the learning of management strategies, information use and technologies with issues of professional conduct, ethics and career strategies. In the traditional classroom-based format, instruction in these components is primarily delivered through separate, stand-alone lectures. While this may in part have been necessary due to their intensity and content richness, the modular approach also sacrifices on the integrative perspective as students encounter difficulty in contextualizing the materials.

Second, the course is designed for graduating seniors faced with the reality of rapid changes in the IS&TM field. These two considerations correspond with Lazar and Lidtke's (2002) claim for the requirement of a service-learning course. Lazar and Lidtke (2002) claim that "an information systems course using the service-learning paradigm is generally appropriate for juniors or seniors who have a thorough understanding of the issues involved in the process of developing an information systems" (p.4) and good candidate courses for a service-learning component would be those that "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" (p.4).

3.2 Course Design and Description

The three phases in our course design comprise: identification of clients and projects, assembling of student project teams, and conducting of projects. Table 1 provides a general timeline for the advanced preparation of the course.

Time	Preparation
8 weeks before class	Client solicitation
6 weeks before class	Project identification
4 weeks before class	Student team construction

Table 1. Advanced Preparation of the Course

3.2.1 Identification of clients and projects: The supervising educators are tasked with identifying clients, sourcing for appropriate projects, and assigning students to teams and projects before the course begins. This process involves:

Approaching prospective clients. Clients in our context encompassed individuals that represent private and public organizations as well as communities. In our case, prospective clients in the local community were initially located through word-of-mouth and personal contacts. They were then approached with an introduction letter stating the objectives of the course, an overview of the students' skills and abilities, the kinds of projects being sought, and requests for indications of interest.

Identifying appropriate projects. From their indications of interest, further details of potential projects were obtained from prospective clients and assessed on scale and scope, as well as the kinds of learning opportunities they would present. From the perspective of the supervising educator, projects were selected for their ability to offer students experience in structuring unstructured problems, conducting needs analyses, developing project plans and solving identified problems in teams.

Developing project frameworks with clients. On identifying likely projects, the supervising educator worked further with the clients on fine-tuning the project details, establishing and clarifying the project scope and objectives. Operational and administrative guidelines such as the means of contacting key liaison persons, broad project timeframes, means of feedback and rules for assessing students were also discussed.

At this stage, a key role of the supervising educator is also to establish the ground rules so as to manage clients' expectations. This includes expectations of overall project performance and quality, day-to-day accountability for project progress, as well as standards of communication and professional behaviors, which are especially important in cases where clients had no prior experience in working with student groups.

3.2.2 Assembling of student project teams: When clients and projects are identified, the supervising educators begin to form project teams. In our case, the supervisors formed project teams of 4 to 6 students each, based on the students' skills and interests as stated in their resumes. Students were required to submit copies of their resumes to the supervising

educator as part of the course enrolment procedure. In organizing teams, the supervising educator was thus able to balance each group's composition in terms of the student members' diversity, mix of skills, experiences and interest areas.

3.2.3 Project conduct: In the course of the semester-long program, students are required to work on their assigned projects in teams. To assist them in better understanding the course structure and track their project's progress, a checklist of project deliverables and milestones is provided (see Appendix A). This checklist also helps with the assessment of student performance.

There are several different models of service-learning that can be used for a class (Lazar and Preece 1999; Lazar and Lidtke 2002). In our course, we designed service-learning projects as semester-long projects which are supplemented by several classroom-based classes at the beginning, middle and end of the semester. Three main milestones are marked for the semester in Weeks 1-2, 7 and 13. These phases are crucial in providing students with relevant in-class material, opportunities to assemble, share their project experiences as well as obtain more direct feedback. A more subtle purpose of the Week 7 meeting is also to provide a means for groups to formally assess their own performance against that of other groups.

In the first two weeks of the semester, the supervising educator meets intensively with each student group to orient them to their projects' details e.g. objectives, needs, project context and clients' expectations. Students are also provided guidelines on expected standards of professional behavior and communication when in contact with clients. Each team is tasked with setting up their first meeting directly with assigned clients and finding out more information about their assigned project. Under the direction of the educator, students are also required to develop a semester plan for the team as well as personal plan for the semester.

Mid-way through the semester, student teams are brought together again to present their project's progress and discuss any issues encountered in the course of their project. Subject to their client's agreement and status of the project, teams might or might not be required to give a presentation of their progress. The aim of this all-class meeting is to provide students with an opportunity to not only reflect on their learning progress to date and assess their projects' progress, but also observe the progress and examples of other project teams in the class and take stock of what they could do better or differently.

Toward the end of the semester, each team submit final reports to the supervising educator and their client. Team experiences are then discussed in an all-class meeting. As a team product, the final report reflects each team's overall project performance as well as each member's specific contributions. The format of final reports varies according to the type of projects undertaken, such as complete websites, databases, technical reports and policy recommendation documents. Submission of these final reports is accompanied by team presentations to the respective clients, supervising educators and other student members. Presentation formats again vary depending on their project type and completion status (e.g. PowerPoint or posters).

3.3 Key Factors in Course Design

Our experience suggests there are two main aspects to designing a service-learning course, namely: establishing expectations and guidelines for all parties' responsibilities and behaviors, and means of assessing students' performance and deliverables.

3.3.1 Expectations and guidelines for all parties: The model in the previous section proposes that joint efforts and collaboration between the students, clients and the supervising educators are the keys to project success. By building in measures for joint accountability, the model aims to maintain a sense of ownership in all parties involved. In particular, the supervising educator is responsible for setting the tone and coordinating interactions between student teams and the respective clients, while the student teams are directly answerable to and responsible for liaising with clients. The model also sets out guidelines and suggestions for client feedback, update, engagement, and assessment.

Guidelines for supervising educators: More specifically, the model sets out guidelines for the supervising educators that encompass the following:

- 1) Weekly meetings. 20-minute weekly meeting sessions with student project teams are suggested from Week 3 onwards (appointments initiated by each team) as a way of maintaining regular updates and supervision of projects. Establishing expectations of such weekly sessions are also meant to motivate the teams to perform and report on activities on an on-going basis.
- 2) Consultation and assistance. While student teams are encouraged to behave professionally and function as autonomously as possible, supervising educators are still expected to monitor progress and provide guidance, resources and general assistance where necessary.
- 3) Evaluation and grading. Student teams are evaluated on their individual contributions as well as their team's overall performance, with letter grades assigned to each student for their overall evaluation.
- 4) Client contact. Student teams have primary responsibility for establishing and maintaining regular contact with their clients. The supervising educators however are expected to meet with clients at not only the initial introductory sessions but also at major project milestones e.g. at mid-semester and end of the semester.
- 5) Coordination. Overall, supervising educators are charged with coordinating the overall relationship between students and clients, especially where potential conflicts arise.

Guidelines for students and teams: This part includes learning objectives for students and expectations for students' performance. Although project details vary, all students are expected to meet the same set of learning objectives. Upon successful completion of the project, students would be able to:

- Structure (an) unstructured problem(s)
- Conduct a needs analysis
- Communicate in a professional context through both oral and written means

- Select and use appropriate research and development methodologies
- Work effectively on a project team
- Identify entrepreneurial opportunities that allow them to creatively use their knowledge and experiences
- Apply their knowledge to problems in new contexts

These learning objectives facilitate individual level student evaluation. Students are also expected to obey the following guidelines when conducting the projects:

- 1) Regular meetings with clients and periodic updates on project progress. Beyond an obligatory initial face-to-face meeting with their clients, students are also strongly encouraged to maintain regular contact and provide feedback to their clients through face-to-face meetings or via telephone where appropriate and adequate. More detailed guidelines for students cover:
 - a. Conduct. Students are reminded that they are conducting their project for a real client and thus the client and any associates or liaison personnel should be considered an "employer".
 - b. Appearance and self-presentation. Appropriate professional dress is required for all face-to-face meetings.
 - c. Meetings with clients. Full participation at the initial client meeting is mandatory of all team members, and as many team members as possible are encouraged to attend subsequent client meetings.
 - d. Ethics and professionalism. Professional behaviour and accountability are expected of every team member.
- 2) Weekly meetings with educators. Students are expected to attend weekly progress meetings with the supervising educators, and weekly progress reports are to be submitted to detail individual work contributions as well as overall team progress.
- 3) Team meetings. Students are expected to attend scheduled work meetings with their teams.
- 4) Ethics and related issues. General guidelines are also provided on expected standards of behaviors, encompassing personal and group responsibility, accountability, reliability, respectfulness, productivity, cooperation and entrepreneurship.

Guidelines for clients: In offering to host activities and providing students with exposure to real-world projects, clients stand to benefit from the outcomes of students' efforts. While clients are not responsible for teaching or instructing students per se, they are expected to assume certain responsibilities with respect to the service-learning experience. This is not only to help ensure overall project success for all parties but also to ensure that real client needs are met.

- 1) Monitoring student teams' progress. To ensure continuing interest in their project's progress and outcomes, clients are encouraged to periodically monitor progress and provide any necessary assistance to their assigned student teams.

- 2) Feedback to educators on team performance. Although responsibility for assessing students' performance and issuing of final grades lies with the supervising educators, clients' evaluation of students' teamwork and overall performance is valuable as they provide another means for educators to assess in-progress facets of students' performance. Clients are encouraged to provide individual-level assessment throughout the semester, and they are required to assess team performance at the mid-point and end of the semester.

3.3.2 Student assessments: Developing effective assessment tools and techniques has become a critical component in designing service-learning courses over the last decade. Reflection assignments such as journals are commonly used in assessing students' perceptions on service-learning (Moffat and Decker 2000). Peer review is also commonly used in evaluating students' performance in group projects (Goode and Teh 2005). In our design, based on Kolb's experiential learning cycle (Kolb 1984), students are evaluated on the basis of their individual contributions as well as the overall performance of their team to see if they meet the learning objectives. Supervising educators and clients are jointly responsible for assessing students' work. Team members are also required to evaluate each other's work. Table 2 lists the assignments designed for the students.

Individual Assessment	Team Assessment
Personal semester plans	Team semester plan
Weekly journals	Mid-term report
Individual contribution to team project and team member's experience assessment	Final presentation
	Final report on project experience
	Technical report on project completion

Table 2. Assignments List

- 1) Personal semester plans. Personal semester plans document each student's role and responsibilities in the project, learning objectives with regard to the project, goals and plans for accomplishing them.
- 2) Weekly journals. Weekly journals record their personal reflections, contributions and learning experiences undertaken in the previous week(s). We designed a template for students to follow, which helped student to organizing their reflections (appendix D).
- 3) Project, team member experience assessment. Students are required to assess their project and their team members' performance at the end of the semester from the perspectives of academic achievement, teamwork and communication, professional behavior and ethical dimensions (see appendix E for detail).
- 4) Team semester plan. Teams are expected to work together to develop realistic and feasible work plans for their projects, including project description and objectives, member roles and responsibilities, and a project timeline.
- 5) Mid-term report. Teams are required to present a

progress report to their clients and supervising educators at the mid-point of the semester in the form of a memo that provides a project overview and brief update using presentation tools such as Powerpoint and Gantt charts.

- 6) Final presentation. Final presentations on each project are given to the respective clients, supervising educators and other student members at the end of the semester. This may take a variety of forms, depending on the type or status of each project.
- 7) Final report on project experience. The final report is a team product, reflecting the team's overall performance and reflection on the project.
- 8) Technical report on project completion. Each team is required to submit their completed project at the end of the semester to the supervising educators and client. This may take a variety of forms e.g. websites, database, technical reports etc. depending on the type of the project.

Beyond these, clients are charged with evaluating the individuals and teams' performance by completing pre-designed forms at the end of the semester (See Appendix B for detail). Supervising educators also evaluate teams and individuals on their presentations and weekly meetings (See Appendix C for detail). Students not only need to assess themselves, but also need to assess their team members' performance at the end of the semester. All these four evaluations from clients, educators and students' sides are helpful in preventing free-rider and non-participant issues and guarantying a fair assessment for each student as much as possible.

3.3.3 Achieving the goals of service-learning: The course design elements described above work toward achieving the goals of service-learning by incorporating the communication, accountability and information exchange flows between the three groups, educators, students and clients/communities, depicted in Figure 1. Together, these elements created a learning environment that linked the learning and service aspects of the course.

Students-Educators (arrows 1,2). The individual assignments of the personal semester plans, weekly journals, and experience assessments were designed to provide structured reflection opportunities for students in order to spur their thinking and knowledge conceptualization. They were designed to help students link the knowledge learned through classroom experiences with the problems faced by their real-world clients. The team semester plan set the course schedule and the weekly meetings between teams and educators were incorporated to maintain project focus and progress, and to identify and address concerns on an ongoing basis. Through these elements, student were given a variety of private and public communication opportunities to discuss everything from client involvement to team dynamics, and educators were able to get a multi-faceted view of team performance.

Educators-Clients/Communities (arrows 3,4,7). The team semester plan also facilitated communication and

information exchange between the educators and the clients, and the coordination role the educators played in managing the student-client/community relationship. The plans provided a starting point for communication between parties and made it evident when certain needs might arise. Because the plans were provided to clients early in the project timeline, all members of the project, students, educators, and clients, were able to track progress, plan for communication and informational needs, and clarify project parameters. Team semester plans helped to properly set and manage expectations on project progress and outcomes.

Students-Clients/Communities (arrows 5,6). The team semester plans played much the same role in the student-client/community relationship as in the educator-client/community relationship. In addition, these plans helped to manage student communication with the client. Because the team semester plans included information on student roles and responsibilities, they aided in the professional conduct of the team members and reduced the potential for client confusion from multiple contacts and unnecessary, and poorly timed requests. In addition, periodic reports provided feedback on student progress to both clients and educators.

4. DISCUSSIONS AND CONCLUSIONS

In focusing on a program design perspective, our aim was to develop a model based on a 15-week semester which could be easily adapted to variations in student and client profile and needs, as well as project types. Within these constraints, the design assumes that reasonable progress can be made toward completion of a project of appropriate scope. The design is highly structured and does not leave much room for "slack" should significant problems or delays occur. However, the design does help to avoid the problems of inertia that often plague student projects. Because students were required to submit weekly assignments, we theorized that students would make steady progress toward project completion, would be more likely to notice problematic situations before too much time passed, and would be more accountable to team-mates and clients. While we found student performance to be satisfied, it is too soon to tell if the structured design is adequate to ensure the intended level of students' accountability to their clients or vice versa. We suggest that while the design may serve as a guide, educators should closely monitor and take actual conditions of project performance and interactions into account so as to make adjustments as necessary.

The first iteration of this course was offered in Fall 2004. Results were generally positive from student, client and faculty. For example, students thought this course provided them great opportunities of applying what they learned from class to real world. Faculty found students had a higher motivation to study than in traditional class environment. More detailed analyses of course impact will be gathered over time. To better assess our proposed model, the next stage would be to collect and analyze students' reflections and reports that were submitted, submissions and feedback from clients, as well as corresponding results of teams' performance. In addition, the more detailed analyses

will be used to refine model and timeline. Within the constraints of designing for a semester-long program, modification and adjustments may be made to the design for more effective implementation in future by better establishing and understanding how the various service-learning program elements worked in practice.

The model calls for all three parties – the supervising educators, students and clients - to work closely in order to ensure service-learning success. Our course design aimed to address this by providing the guidelines for communication and structuring interactions, methods of accountability, and the overall management of expectations. Our experience also suggested two key challenges in designing a service-learning course in the field of IST&TM. Further improvements to the design of IS&TM service-learning courses can be made by addressing these two issues. First, because of the different situations the faculty may have (e.g. a small town with few businesses, a new faculty), the identification of clients and projects that appropriately matched students' needs, skill levels and course objectives is not only time-consuming, but difficult. A way to ease the planning process may be to contact the career planning office for information on the current job market demand, needs in the field and a list of potential clients. The clients may be from outside of the school and/or inside of the school as long as the projects are real. A better understanding of the skills in demand could assist in the selection of project types that could provide students with the opportunities and exposure to utilize the relevant skill types.

A second challenge concerns the designing of assignments that would contextualize students' classroom learning in terms of service-learning, a linkage that is critical to the success of service-learning. The requirement of weekly journals, semester plans, periodic presentations and reports ensured that students regularly engaged in reflection on their experiences and performance. The number of assignments and interactions as indicated in our model also points to the intensity and significant time commitment entailed between educators and students and also between students and their respective clients. While the exact level of interaction and engagement may be subject to wide variation, our fundamental premise is that collective commitment, engagement, and ownership of the outcomes of service-learning oriented courses and programs should be the focus to ensuring positive experiences.

The inclusion of service-learning components to undergraduate curriculum can not only offer pedagogical value but also significantly influence students' learning, motivation and achievements. By exposing students to real-world contexts and situations where knowledge is tested for practicability, it helps students to transition from the world of theory and academia to the world of practice. Such experiences can also enable students to build professional contacts and gain personal growth and insights prior to entering the job market. As such, service-learning programs can be designed to address students' life-skill needs as well as supplement and contextualize their classroom-based educational experiences.

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AUTHOR BIOGRAPHIES

Kangning Wei is a Ph.D. Candidate in Information Science and Technology at the School of Information Studies, Syracuse University. Her research interests address the social impacts of information technology on new organization forms. More specifically her current work focuses on distributed work, knowledge management in distributed settings and cross-cultural issues. Her teaching interests are information systems design and analysis, organizational behavior and human-computer interaction. She holds a B.S.



in Information Management and Information Systems and a Master of Management in Management Science and Engineering both from University of Science and Technology of China.

Jane Siow is a Ph.D. student in Information Science and Technology at the School of Information Studies, Syracuse University. Her research interest focuses on the impacts of IT and information security on users, with particular focus on user behaviors and information security compliance in the workplace. She holds a M.A. in Journalism Studies from the University of Westminster in London, UK and a M.S. in Information Resources Management from Syracuse University.



Diana L. Burley is a Program Director in the Division of Undergraduate Education (DUE) at the National Science Foundation (NSF). Dr. Burley's programmatic responsibilities include leading the Federal Cyber Service: Scholarship for Service (SFS) Program and evaluating computer science education proposals submitted across the Division's programs. Dr. Burley is currently on assignment at NSF from her faculty position in the School of Information Studies at Syracuse University where she is an Assistant Professor of Information Management. Prior to joining Syracuse University, Dr. Burley was a member of the Kelley School of Business faculty at Indiana University. Dr. Burley received her B.A. in Economics from The Catholic University of America, and she holds three degrees from Carnegie Mellon University: an M.S. in Public Policy and Management (MIS concentration), an M.S. in Organization Science, and a Ph.D. in Organization Science and Information Technology.



APPENDIX A. Checklist for Project Deliverables and Milestones

Week	Deliverable/Milestone
1	Establish initial contact with client and set up the date of 1st meeting Set up weekly 20-min meeting schedule with supervising educator Team plan Lecture on communicating with clients, team dynamics
2	Deadline for submitting project budget proposal (if applicable) Meeting with client Lecture on project management
3	Submit personal semester plan
4-6	Working on projects; Weekly journal due
7	Mid-term report due
8-12	Working on projects; Weekly journal due
13	Final report due Presentation/posters to class and clients
14	Work on project report and manual for clients
15	Final project report delivery to client and supervising educators

APPENDIX B. Client Assessment

Client Assessment of Student Team

Team name: _____ Client: _____

Competencies	Poor 1	2	3	4	Excellent 5
Skills (Technical, Managerial & or Research where applicable) - Ability to apply and demonstrate skills learnt from classes to assigned project					
Communication - Ability to listen, ask questions and communicate effectively using written and oral presentation methods					
Teamwork - Ability to participate, demonstrate accountability and function responsibly as a member on a multidisciplinary team					
Resourcefulness - Ability to acquire and apply knowledge from outside standard courses or avenues					
Community awareness - Demonstrated understanding of client's organization and needs, and benefits of the project to the community					
Professional behavior & ethics - Demonstrated understanding and awareness of ethical aspects or issues encountered in their project					

Remarks _____

Client Name: _____ Client Signature: _____

Date: _____

Client Assessment of Individual Students

Project Team Name: _____

(A) Student name: _____ (B) Student name: _____

(C) Student name: _____ (D) Student name: _____

(E) Student name: _____ (F) Student name: _____

Grading Scale: Poor = 1, Excellent = 5

Competencies	Students					
	A	B	C	D	E	F
Skills (Technical, Managerial & or Research where applicable) - Ability to apply and demonstrate skills learnt from classes to assigned project						
Communication - Ability to listen, ask questions and communicate effectively using written and oral presentation methods						
Teamwork - Ability to participate, demonstrate accountability and function responsibly as a member on a multidisciplinary team						
Resourcefulness - Ability to acquire and apply knowledge from outside standard courses or avenues						
Community awareness – Demonstrated understanding of client’s organization and needs, and benefits of the project to the community						
Professional behavior & ethics - Demonstrated understanding and awareness of ethical aspects or issues encountered in their project						

Remarks:

Client Signature: _____

Date: _____

APPENDIX C. Faculty Assessment

Faculty Assessment of Individual Students (10 marks)

Student Name: _____ Team Name: _____

Competencies	Poor 1	2	3	4	Excellent 5
Skills (Technical, Managerial & or Research where applicable) - Ability to apply and demonstrate skills learnt from classes to assigned project					
Communication - Ability to listen, ask questions and communicate effectively using written and oral presentation methods					
Teamwork - Ability to participate, demonstrate accountability and function responsibly as a member on a multidisciplinary team					
Resourcefulness - Ability to acquire and apply knowledge from outside standard courses or avenues					
Community awareness – Demonstrated understanding of client’s organization and needs, and benefits of the project to the community					
Professional behavior & ethics - Demonstrated understanding and awareness of ethical aspects or issues encountered in their project					

Remarks:

Faculty Name: _____

Grade: _____ out of 10 (total marks/3)

Faculty Signature: _____

Date: _____

Faculty Assessment of Student Team

Team name: _____

Competencies	Poor 1	2	3	4	Excellent 5
Skills (Technical, Managerial & or Research where applicable) - Ability to apply and demonstrate skills learnt from classes to assigned project					
Communication - Ability to listen, ask questions and communicate effectively using written and oral presentation methods					
Teamwork - Ability to participate, demonstrate accountability and function responsibly as a member on a multidisciplinary team					
Resourcefulness - Ability to acquire and apply knowledge from outside standard courses or avenues					
Community awareness - Demonstrated understanding of client's organization and needs, and benefits of the project to the community					
Professional behavior & ethics - Demonstrated understanding and awareness of ethical aspects or issues encountered in their project					

Remarks: _____

Faculty Name: _____ Faculty Signature: _____
 Date: _____

APPENDIX D. Student Weekly Journal

Due weekly from Week 3 – 14. No more than 1-2 pages, double-spaced. (5 marks each)

Week # _____ Date submitted: _____

Contributions, tasks & activities accomplished in the previous week:
Uncompleted or deferred tasks & activities:
Reflections & notes on particular experiences in the previous week:
Lessons learnt in previous week:
Other observations (if any):

APPENDIX E. Project and Team Member Experience Assessment

* Due in Week 15 – 16 (10 marks)

Project Assessment

Academic/learning achievements:
Teamwork & Communication:
Observations on Professional Behavior & Ethical Issues:

Academic/learning achievements:
Teamwork & Communication:
Observations on Professional Behavior & Ethical Issues:



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