

Offering Service Learning Projects in a New Environment

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Abstract - *The focus of service learning is to provide opportunities for our students to gain real, practical experience while completing "real world" projects, which often become extensions of the classroom itself. One of the major goals of service learning is to enhance student learning while at the same time meeting a need within the local community "beyond the gates" of our College. This paper briefly describes the challenges of starting up Service Learning projects at a new College and how I dealt with those challenges. The remainder of the paper describes several of the Service Learning projects my students completed during my first semester at the new school.*

Keywords: Team Projects and Case Studies, Collaborative Learning, Service Learning, Projects and Software Engineering

1 Introduction

After many years of very successfully incorporating Service Learning projects into my courses, I found myself in a new situation. My former school's administration decided to eliminate the Department of Computer Science (which I chaired), so I suddenly found myself looking for a new job. I knew that my preference was to find school that embraced the Liberal Arts and had a strong Computer Science program. Happily, I was successful in securing a position at such a school!

I found myself "starting over" in many areas, with new colleagues, new students, a completely new environment, new courses, new schedules – basically, new "everything". My initial inkling was to wait a while before attempting to tackle Service Learning projects in the midst of all of this "newness", but I decided to "go for it" and see what happened. As it turns out, what happened was very good!

2 Getting (Re)Started

In this new environment, I no longer had my well-established list of contacts throughout the community, my stockpile of recently-proposed projects that hadn't yet been assigned (along with eager, built-in clients), my reputation of a successful history of past projects, or my standard request-for-proposals email messages. So, I wrote up a short email message (since it was the Friday before the first week of classes and everyone was being inundated with the usual beginning-of-the-school-year email barrage) in which I introduced myself

as the new guy in Computer Science, briefly described the types of projects I was seeking, and asked for help in spreading the word:

Subject: Any "Computer Projects" on your wish list?

Hi, all.

Please forgive the "mass email" nature of this message, but I figured it was the "safest" way to reach interested parties.

I am teaching Software Development II this semester and am looking for good, interesting semester projects for the students to work on. We are looking for "real world" projects that will benefit on- and/or off-campus groups. For off-campus groups, our preferences are non-profits and K-12 education.

I'm not really looking for tiny projects -- something more substantial would be better. For example, in the past my students have written software for the Mississippi Department of Health, Mississippi Children's Home Services, several local public and private schools (learning "games" for pre-K students, math quiz "games" for 1st - 6th grade). If you're not sure whether your project is the "right" size, just contact me and we can discuss it.

I usually send out this information well in advance of the semester, but since I'm "that new guy in Computer Science", this is a last-minute request.

My plan is for the students in my classes to choose a set of projects for each class to work on next Thursday and Friday (Sept. 5th and 6th), so it would be great if we could discuss your project ideas by Wednesday, the 4th, at the latest.

Sooooo, do you have any computer application needs for your area? If you do, please reply and let me know.

Thanks!

--Don

I wasn't sure what to expect in terms of responses, but happily was overwhelmed by the number of replies that came in – several dozen in the first day! I met with many people who had wonderful ideas and tried to help them create brief descriptions of their projects so that I could present them to my classes.

My arrival in my new department coincided with the second year of its newly-revised curriculum. Students begin their studies with CMPT120 – Introduction to Programming, which exposes them to introductory programming skills using HTML, CSS and JavaScript for program development. The second required course is CMPT220 – Software Development I, in which students continue to master software development skills while using Java and JavaScript to learn about basic data structures. CMPT221 – Software Development II is the third required course our students take. In this course, students are exposed to client-side programming, server-side programming and data integration over the web. Our development environment is PHP and MySQL.

Software Development II seemed to be a nice “fit” for larger projects in which students worked in dynamic groups throughout the Software Engineering Life Cycle. My normal approach is to have students work in teams to create the deliverables for each Life Cycle phase (requirements, specifications, preliminary design, detailed design, implementation and testing) for each project. At each milestone, the students change projects and change teams. This has the advantage of exposing students to different projects at different stages with different teammates, which is likely to be what most students will experience out in the “real world” after graduation. The process I use for managing these class projects has been described in [1][2][3][4][5].

The proposed projects were presented as possible semester-long projects. The students in my Software Development II courses were also required to propose semester projects for the class to consider. After all of the ideas were

presented, the students themselves selected the projects we would tackle. The classes conducted client interviews for each project, then teams took each project though each milestone. At the end of the semester, the clients attended presentations for each project. The remainder of this paper describes several of the Service Learning projects that my classes completed during the Fall 2013 semester.

3 The Projects

3.1 Department of Corrections

Our client requested the development of a website to track data about the Transition Program within the Dutchess County Sheriff’s Office Department of Corrections Division. [6] The Transition Program is an invitation-only program for inmates who are approaching their release dates and have maintained a good record while serving their time. Inmates who participate in the program have their own housing unit, recreation yard and counseling system. Participants are offered special outreach programs related to domestic violence, parenting, substance abuse, anger management, creative writing and film therapy. Those who do not have a high school diploma (or equivalent) are required to work toward their GED while in the Transition Program. All of these efforts are aimed at reducing recidivism and easing the transition back into the wider society. Contact does not end after an inmate is released; the Transition Program continues to work with the participants, helping them find assistance they might need, contacting them monthly to check up on them, and helping to ensure they are meeting any

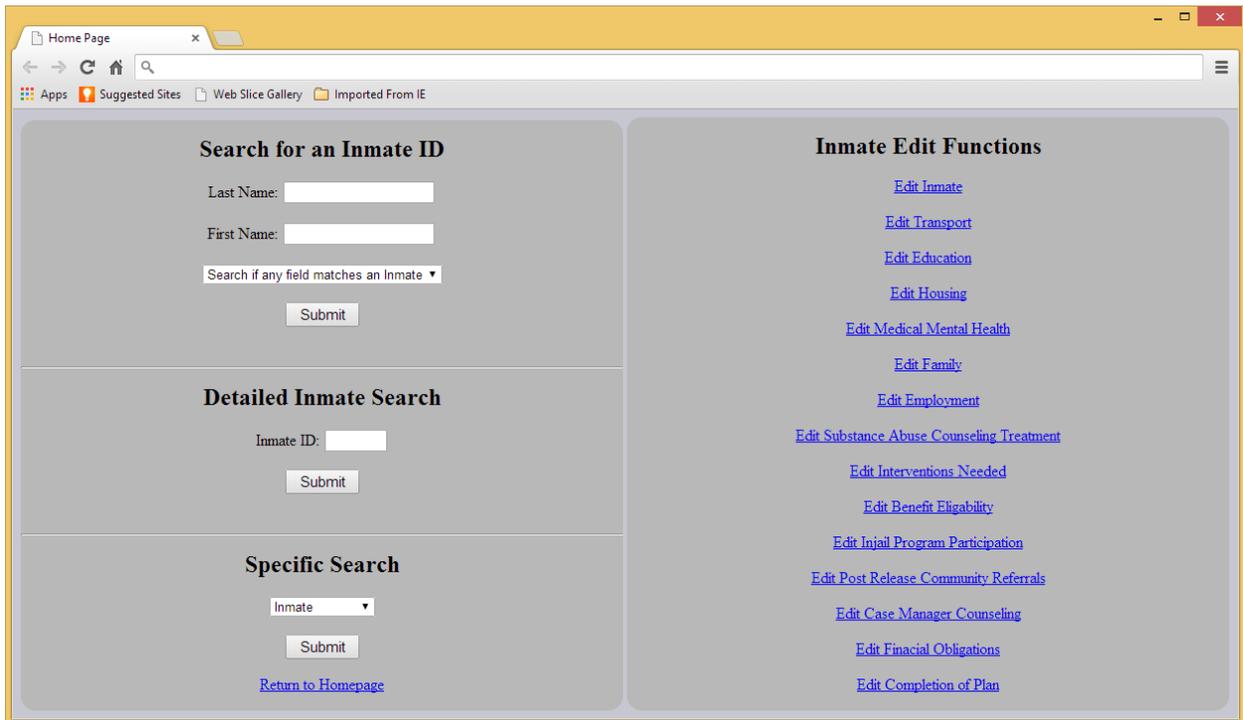


Figure 1 - Department of Corrections Search Screen

required post-release requirements that might have been assigned by the Courts.

The Department of Corrections has its own data system for its entire inmate population. Of course, this system is not set up for the specialized needs of the Transition Program (whether the participants will be eligible for public assistance, Medicaid, SSI or the like; will have a place to live, transportation, and employment; have special medical or mental health needs; need post-release community referrals, and so on), so most the additional data tracking and recording for the Program was being done on paper – not an ideal situation, to say the least. We received copies of all of the paper forms that were being used and developed a website that could be used by the Program officers to track the data, run queries and generate reports.

3.2 Internship Tracker

Our client for this project was one of our Computing Technology faculty members who is in charge of managing all of the internship opportunities for our Computer Science, Information Science and Information Technology majors. (Our internship program has been tremendously successful, and tracking all of this data has become quite an undertaking.) Features requested for the proposed website include managing each of our internship and career fairs, tracking all of the companies/organizations that offer internships (along with descriptions of each internship, their requirements and their pay ranges), the students who have completed internships (and the feedback they were willing to provide about their experiences), and a straight-forward means to allow current students to

research the available internships for which they meet the requirements. The ability to generate reports and statistics for members of the administration were also included.

3.3 Practice Tests for the New York State 3rd Grade Reading Examination

This client, a school system located in the suburbs of New York City, wanted a system that would expose its Kindergarten, first- and second-grade students to the online environment they would experience when taking the New York State Department of Education English Language Arts 3rd Grade Examination. [7] Their current practice is to give students sample multiple-choice tests on paper, but they wanted the students to be able to take these practice tests online to more realistically represent the actual testing environment. We were tasked with the development of a system that would allow teachers to create sample questions and compile them into grade-appropriate tests (with the ability to have the system shuffle the order of the multiple-choice options presented for each question); grade those tests and report the results by student, class, and grade level; and offer feedback about the students' progress, including questions or areas where students may have struggled.

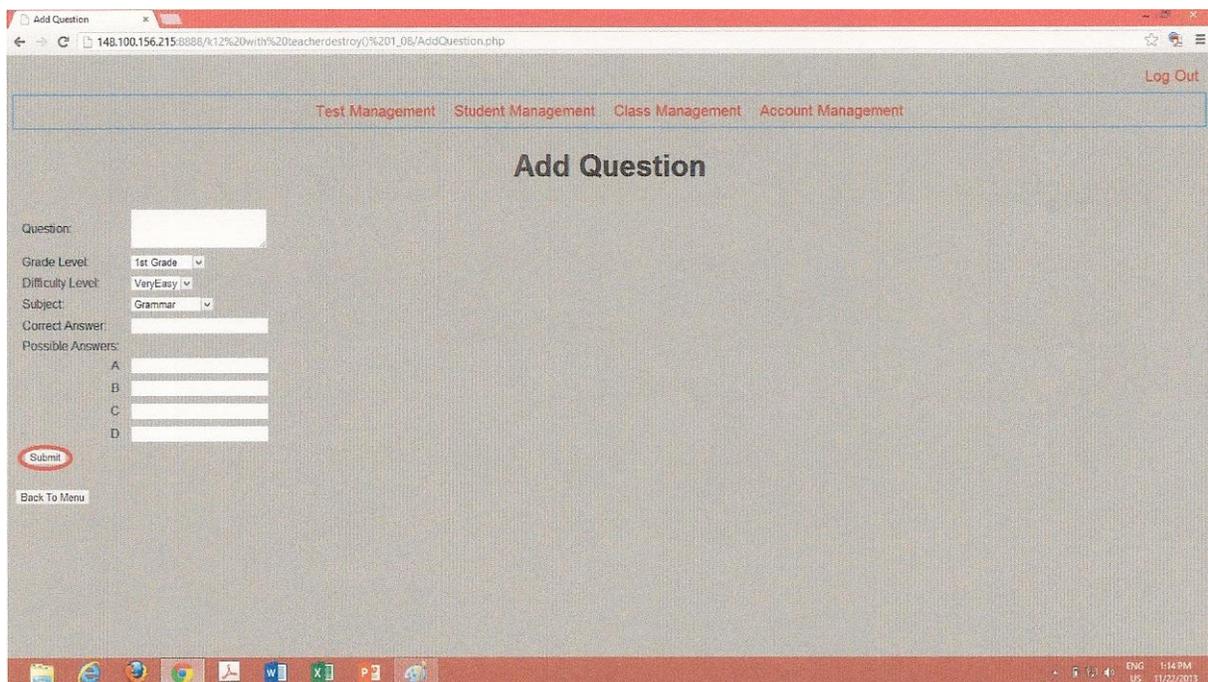


Figure 2 - Practice Test Generator - Add Question Screen



Figure 3 - Jeopardy Main Screen

3.4 Jeopardy

A colleague who teaches business classes submitted a proposal for an in-class review/quiz system based on the *Jeopardy!* game show. This client developed a version of this system in PowerPoint, but was unhappy with its static nature. The proposed website would allow the professor to create new topic categories, enter multiple questions and answers for each difficulty level within each category, and create student teams as contestants for the game. To start a new game, the professor selects categories, after which the system generates a new game board with randomly-selected question/answer pairs, along with a randomly-selected “double jeopardy” indicator.

3.5 Fang Protective Services

Fang Protective Services is a constituent organization of the U.S. State Department’s Overseas Security Council of Diplomatic Security. Their mission is to enhance “the safety and security of faith-based humanitarian and medical mission teams as they care for the most vulnerable members of humanity”. [8] They offer training and seminars to various non-governmental organizations (NGOs), help with the development of security policies and crisis management plans, and conduct risk assessment activities.

Their project proposal included the development of a website that would provide instruction-based materials and security-based briefings for their clients, as well as training and

testing features for security personnel. The instructional materials include documents, reports and videos. The training and testing materials include written and video-based quizzes and simulations. The video quizzes are designed to take users through “real world” scenarios, occasionally stopping the demos to quiz the user about what to do next. The action continues (or not) based on the user’s responses.

3.6 Center for the Prevention of Child Abuse

The Center for the Prevention of Child Abuse is a local non-profit agency whose mission is “to reduce the incidence of child abuse and neglect by providing education, prevention, and intervention services throughout Dutchess County”. [9] They provide various educational parenting services, including personal safety programs, community education and mandated reporters training, parent empowerment programs, special needs parenting programs and teen parenting programs. They are a private company that receives some funding from various federal and state agencies, but they also depend heavily on donations from various private and community sources. As such, they are often asked to provide detailed reports about the levels of success they achieve with the various programs they offer. Their current practice is to collect program-specific data using paper forms and Excel spreadsheets. Their proposal requested a website that would provide a much easier platform for data collection and reporting. They provided us with a

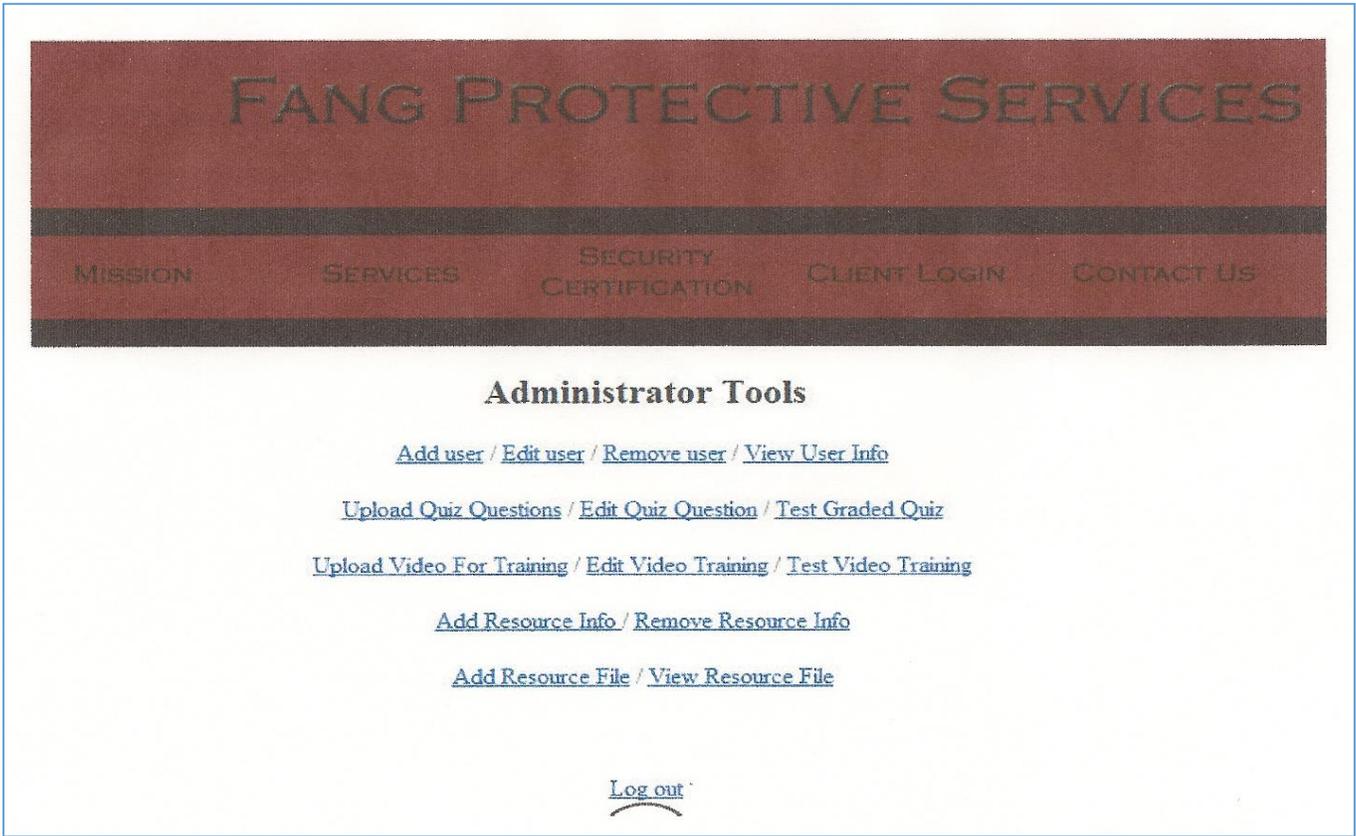


Figure 4 - Fang Protective Services Administrator Tools



Figure 5 - Center for the Prevention of Child Abuse Report Generation Page

collection of forms and spreadsheet examples, which we then converted into web pages and connected to a centralized database.

3.7 Clinical Rotation

Our college’s nationally accredited Medical Technology Program is a cooperative effort that includes eight local hospitals and clinical laboratories in the surrounding area. The program requires that students complete a 23-week clinical rotation as part of the requirements to earn a B.S. degree with a major in Medical Technology. The number of students participating in each rotation period is capped at 24. The rotation includes the following lab requirements: five weeks in Hematology, five weeks in a Blood Bank, five weeks in clinical chemistry, six weeks in clinical microbiology, one week in urinalysis, and one week in outpatient phlebotomy followed by three weeks of inpatient phlebotomy. Only the inpatient phlebotomy lab may overlap with another rotation at the same location. Only one student is allowed in each lab at each location, with one exception: one of the hospital locations allows for two students to concurrently complete one, or sometimes two, of the labs. Most, but not all, of the locations offer every lab requirement. Most, but not all, labs at each location are available during the entire 23-week period of the rotation.

The director of the program had been using a paper-based system (involving multi-color pens and flags) to schedule the 24 students in the various labs, so she was thrilled to be able to propose a project aimed at automating this system. The system would allow directors to indicate which hospitals and clinics were participating in the program, specify the labs being offered at each location, enter the weeks the labs were available, and input information about each student in the rotation. The system would then create schedules for each

student and lab location and provide those schedules to each student and hospital/clinic. The directors would also receive master schedules with full details about everything.

The clients for this project were probably the most thrilled of all clients with the finished product. However, in the interest of full disclosure, I must report that the students (remember, this is a sophomore-level class) were unable to successfully tackle the scheduling algorithm, so I had to step in and develop a solution. My initial thought was to simply write an algorithm that recursively generated all possible schedules until it found one that worked. However, that approach did not work since each particular student’s labs could start and finish on any week of the rotation. The other complicating factor was the issue with the in-patient phlebotomy lab, since it could overlap with any other lab (that the student had not yet completed) at the same location as that student’s out-patient phlebotomy lab. This required that the algorithm include a look-ahead feature to determine whether there were any future labs (that the student had not yet completed) available at that location. Coming up with that code in a short period of time was indeed quite challenging (and may likely become the focus of a publication in the near future!).

4 Conclusions

Service Learning projects offer a wide variety of benefits. Students get experience interacting with “real world” clients while developing “real world” projects that will actually benefit many constituents. Our clients benefit by receiving no-cost, top-quality software tailored especially to their needs. Outreach into the wider community can help to strengthen ties between the academic institution and its local neighbors. Reaching out to these neighbors, especially if you are the “new kid in town” can seem daunting, but it does not have to be. Take a chance – I’m very happy that I did!

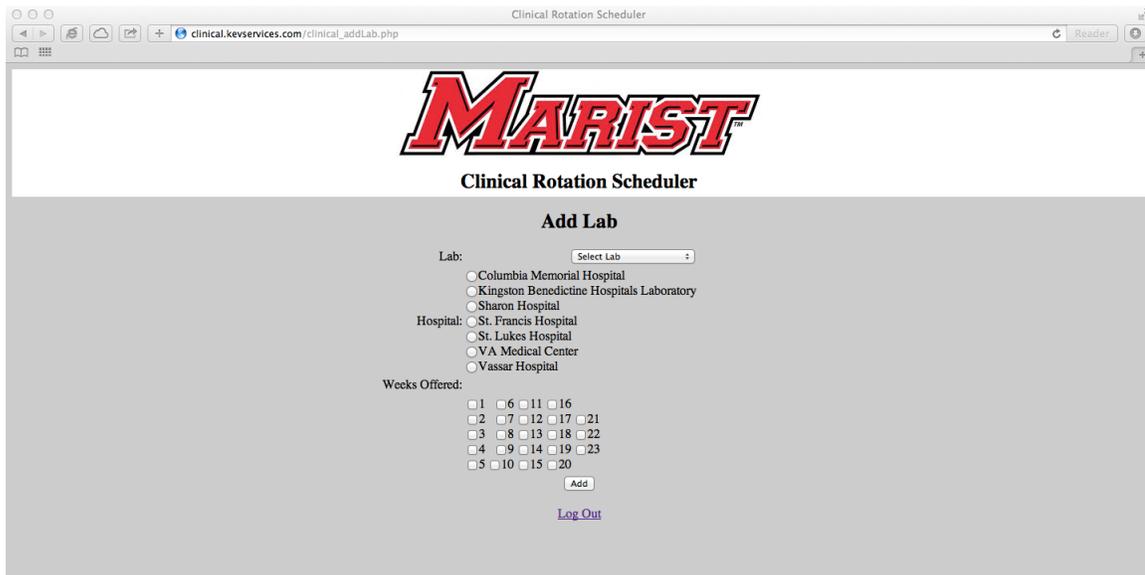


Figure 6 - Clinical Rotation Add Lab Page

5 References

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