

A Community Outreach Programme for Information Systems Students at the University of Cape Town

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Abstract

This paper reports on a new community outreach programme which was started in the Department of Information Systems in 2004. Apart from the team-based systems development projects and the empirical research projects which take place in the community at large, all full-time IS Honours students are required to engage in a community project of their choice in order to gain some practical real-world experience and let the community benefit from their IS skills.

The key idea is that the project should help the community at large i.e. it should take place in NGOs, government organizations, schools and similar organisations. It may not be done in a commercial or for-gain environment. The paper gives a background for community service programmes, reports on the various practical aspects of implementing and running the programme and provides some highlights of the programme to date. It is hoped that the positive findings can be replicated in other IS departments in higher education in order to increase the public profile of the IS discipline.

1 INTRODUCTION

One of the stakeholders of the University is the community. African universities have realized this perhaps more than their overseas' counterparts and most South African Higher Education Institutions (*HEIs*) have a number of community outreach programmes in place. However, it appears that few Information Systems departments participate in these programmes. It must be noted that a "true" community outreach project is where the balance of value clearly lies with the community, not the university or student's side. Many Departments of Information Systems have system development projects with corporate or NGO sponsors, but often the major benefit lies in the student (or department) finding mentors and/or staff to solicit user requirement specifications – the sponsoring organisation usually ends up a prototype or, at best, somewhat buggy, unsupported "crippleware" for their time involvement.

Traditionally, the Department of Information Systems (IS) at UCT has required third year and honours students to select system development projects as well as empirical research topics in the community at large – similar to the curriculum requirements at many other HEIs. However, most of the outcomes of these benefited the students more than the sponsoring organizations. Last year a purely "altruistic" programme was launched in which all registered full-time IS Honours students are required to engage in a community project of their choice in order to gain some practical real-world experience and let the community benefit from their IS skills. Various short- and long-term benefits can accrue to the various parties, including students, community and faculty [1].

A number of different models exist for incorporating IS-related "community projects". The following

gives some examples. Due to the lack of information on South African IS community projects, the examples are gleaned from overseas institutions.

1.1 Completely voluntary – no credit and no requirement

No good example of a completely voluntary IS community project was found, but the Kelly School of Business at Indiana University has a "Civic Leadership Development (CLD) Program": This community service, learning and leadership program facilitates opportunities for undergraduate business students to volunteer, to learn about the non-profit sector, and to consider issues critical to good citizenship. If there is no course credit (or money) and it is not a graduation requirement, why should students participate in CLD? "To learn about non-profit agencies; volunteer; have fun, distinguish oneself, learn about the challenges that face communities and gain valuable experience and recommendations". [<http://www.kelley.iu.edu/kelley>]

1.2 Voluntary but for credit purposes

The California State University's Service Learning Institute offers the "CST 361S - Technology Tutors Service Learning: This is a service learning course in which students apply computer literacy, multimedia design, and technology to assist schools, non-profit organizations, and community agencies. The theme for the course is 'Bridging the Digital Divide.'" [<http://service.csUMB.edu/overview/courses.html>]

1.3 Compulsory and for credit purposes

IS students at most community colleges have to earn credits by completing a combination of actual community service. This is often complemented with some coursework on service-based learning, e.g. at the Salt Lake Community College, this would entail 150 hours of community work and a short course [<http://www.slcc.edu/pages/2554.asp>].

1.4 Compulsory, not for credit purposes

“Alvernia College requires community service to be completed by all students before graduation. The purpose of community service is to affirm the College’s core value of service, and to instil in students a sense of volunteerism and civic engagement through service to non-profit organizations or needy individuals in the community.”

[<http://www.alvernia.edu/academics/core.htm>]

In some cases, these community service learning courses can count for a fairly significant portion of the total credits required e.g. at the Business School of the University of Wisconsin it can be up to 1/8th of course requirements. (This should not be confused with some more or less dubious “degree” programmes whereby one’s “work experience” counts for a significant if not overarching part of the degree’s credit requirements.)

In addition to earning credits, both staff and students are often incentivized by offering annual awards for “community service” – even if the service forms part of the curriculum as at, for example, the Tennessee Tech University

[http://www.tntech.edu/techtimes/2004/04_04/04_30/community.html].

University of Illinois’ Graduate School of Library and Information Science has an “Information Professionals for Social Justice” Group which engages in, *inter alia*, community outreach and service-learning such as community networking and public access computing in low-income neighbourhoods [<http://www.lis.uiuc.edu/~bishop>]

An interesting approach is taken at De Paul University, which has established a completely separate Center for Community Technology Support (CCTS). It provides the Website design, Computer networking, and a variety of other services such as developing software and conducting workshops to non-profit organisations [<http://ccts.cs.depaul.edu>] and a specific course on “Software projects for community clients”

The course aims specifically at disenfranchised communities, where the “digital divide” gap is most evident. Apart from helping the community, it is hoped also that “students will have the opportunity to assess urban community needs in the technology arena and develop skills in assisting and developing methods for bridging the digital divide.” A specific objective of the course is to “increase students’ knowledge of urban community technology status and needs” thus giving them experience in analyzing and tutoring in these technologies.

2 AN EDUCATIONAL RATIONALE FOR COMMUNITY SERVICE PROJECTS

In addition to the community benefits, it is strongly believed that these types of service projects contribute greatly to the student’s learning experience i.e. “experiential learning” [2]. This is reinforced by research that demonstrates clearly that knowledge and learning retention rates are many times higher when teaching others and practicing rather than merely reading or listening to information.

Most of the literature on the subject refers to a “community-service learning” approach [3]. An interesting framework to demonstrate this is Fink’s taxonomy of “Significant Learning” – meant as a social update of the more widely known Bloom’s taxonomy [4]. Fink distinguishes the following levels of learning [5]:

- Foundation Knowledge – understanding and remembering facts and ideas;
- Application – acquiring skills, creative and critical thinking, managing projects;
- Integration – connecting ideas, people, and realms of life;
- Human Dimension – learning about oneself and others;
- Caring – developing new feelings, interests, and values; and
- Learning How to Learn – becoming a better student, inquiring about a subject, self-directed learners.

So, although Johnson [1] warns against it becoming a fad, a community-based programme can be seen as a “powerful and proving teaching strategy which can enrich student learning, enhance your teaching, and revitalize the community.”

3 THE COMMUNITY OUTREACH PROGRAMME FOR IS STUDENTS AT UCT.

3.1 Description

The project implemented at UCT goes under the acronym HOCIP: Honours Outreach and Community Involvement Programme. All registered full-time IS Honours students are required to engage in a community project of their choice in order to gain some practical real-world experience and let the community benefit from their IS skills.

3.2 Some salient features

- **Time budget:** The total time commitment expected from the student 20 “contact” hours (excluding travelling and preparation time)
- **Individual:** The engagement is an individual one, but students may work together in small

groups where appropriate if this results in a more meaningful overall project engagement.

- **Independent:** The involvement may in *no way whatsoever* be linked to any other academic or commercial project undertaken by the student e.g. it may *not* be the same organization as the sponsor for the IS Honours system development or empirical research project, or be related to any “paid-for”
- **Community:** The project should help the larger community i.e. it should take place in NGOs, government organizations, schools and similar organisations. It may NOT be done in a commercial or for-gain environment.

3.3 Deliverables

Three deliverables have to be submitted to the HOCIP coordinator.

1. At the start of the project, each student must submit an initial Memorandum of Understanding (a sample form is provided to students). It consists of:
 - a. about ½ -page on the organization: name, mission, contact details including sponsor (contact person)
 - b. about 1 page stating the nature of the engagement as well as a very specific description of the duties of the student (including dates/times).
2. At the end of the project, students are required to submit a 2 page Project Summary specifically detailing the outcomes and/or contributions by the student. In 2005, this will also require a self-reflective statement on what the student learned from the project. In addition, a 1-page “time sheet” detailing dates & times spent by the student is also required (students choose their own format)
3. 1 short confidential report or letter (on the letterhead of the sponsoring organization) sent by the sponsor directly to the department as an independent verification of the student contribution. One paragraph generally suffices. (Free format)

Note that all deliverables have to be signed by the sponsor.

3.4 Practicalities

The student is responsible for locating a suitable project.

The Memorandum of Understanding should be handed in mid-March. The final Project Summary should be handed in by the end of May. The confidential report from the sponsor must reach the department by mid-June. The hand-in dates are early in the academic year so that the HOCIP does not impact on the larger deliverables required from students (their systems development project and their

empirical research report). However, hand-in dates can be postponed on request given an acceptable motivation and if the student takes full responsibility that this extension will not impact negatively on other honours deliverables.

It is not the intention of the programme to generate marks but satisfactory completion and hand-in of all deliverables is a course requirement. Non-compliance may result in a DPR. In addition, a small course mark (< 5%) may be allocated for HOCIP.

3.5 Typical Examples

The following are some sample programmes a student can investigate.

- Installing and maintaining an open-source software installation for an NGO/NPO/community organization/educational institution.
- Designing a customized database for an NGO.
- Developing and finding a (free) host for a simple static website for an NGO/...
- Doing a once-weekly maintenance of the computer lab of a school.
- Getting together a group of first year students from disadvantaged background on a weekly basis to discuss their studies (and various other related problems they may be experiencing) and serving as a mentor for them.

Furthermore, a list of previous year’s projects and organizations seeking assistance for the current year is posted on the notice board. Work performed in exchange for a reward (whether financial or not) or intrinsically related to any other activity which has been rewarded, is not acceptable. Also not acceptable are favours to friends or family (e.g. teaching computer literacy to one’s girlfriend’s father or removing viruses from one’s grandmother’s PC).

4 THE FIRST TWO YEARS OF THE PROJECT

The following graphs give a high-level indication of activities which are being undertaken. As can be gleaned from the charts, training and/or tutoring is the most popular type of project – accounting for half of the projects in 2005. This typically involves tutoring of learners in schools in basic computer literacy or “teaching-the-teachers” projects, often including a component of network/computer maintenance. The second-most popular activity in 2004 was the design of a static i.e. informational website for various organisations. This dropped significantly this year although the decline is offset entirely by the concordant increase in design of web-based systems i.e. dynamic, database-driven web sites. However, the latter are classified with the “system design” category. Support of hardware consisted mainly computer labs (PC and network) maintenance.

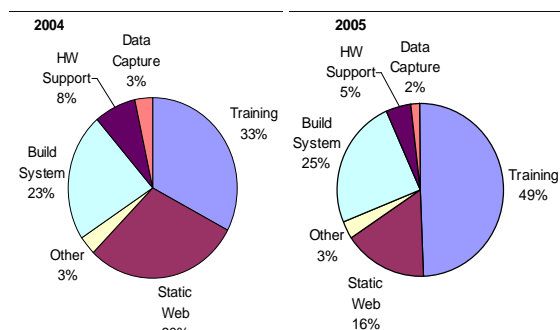


Figure 1: Types of activities

Equally interesting is to look at the type of organisations. The most popular beneficiaries of the 2005 projects were on-campus organisations – mostly SHAWCO and UCT sports clubs. This is a shift from 2004 where non-profit organisations accounted for one-third, which dropped to 13% in 2005. These figures exclude religious organisations such as churches which account for about a tenth of the projects. Interestingly, schools and other educational institutions account for roughly a quarter of the projects. Governmental organisations doubled their share from 6% in 2004 (mainly City of Cape Town) to 13% in 2005.

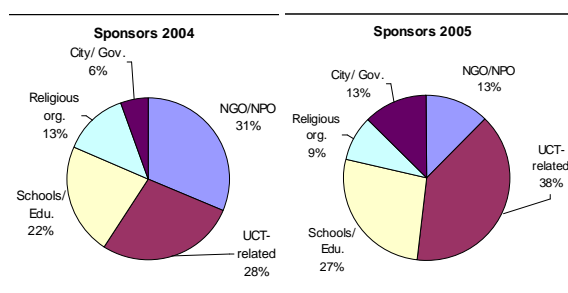


Figure 2: Project Beneficiaries

5 SOME TYPICAL PROJECTS

The following are examples of projects undertaken by students, indicating typical or preferred types of projects.

- Train high school learners and teachers in basic computer skills and lab management under auspices of SHAWCO.
- Creation of a contacts database and integrate with a mailing system for the Center of the Book.
- Act as business analyst and mentor disadvantaged learners in the City of Cape Town's Kulisa project.
- Design a website for a church to allow members to access bible studies and electronically search the bible.
- Develop a daily task management system for the Domestic Animal Rescue Group.

- Capture and interpret data pertaining to structural fires for the Disaster Mitigation for Sustainable Livelihoods Programme.
- Develop a browser-based children tracking database for the James House Children's Home.
- Build a website to assist in reunion of patients and friends post-treatment (JHB Hospital).
- Static website and student pep talks for Mananga College (Swaziland).
- Develop a society website template to allow for easy updating of any UCT SRC-linked society's website.
- Develop an employee and sponsor database for the Self-Help for the Healing Business.
- Develop an SMS/internet contacting system for the Baha'i Community.
- Assist with the PC literacy programme for the youth leadership rehabilitation programme of Polsmoor Prison.
- Tutor students on the introductory IS course of the 4-year BAdmin degree at Tsiba Education.
- Set up a library management system for the Islamic Youth Society's Library.
- Develop a booking system for FamSA.
- Set up a website and content management system for the Hope and Dream Trust.
- Create a database for a UCT student residence.
- Develop a lost and found animals portal for the Animal Rescue Organisation.

As can be seen, not only do the projects exhibit a wide scope and range of beneficiaries, but many tasks develop student skills. Hopefully, the benefits for the community are not only real and measurable, but hopefully sustainable.

Students do not only develop technical skills, but many benefit tremendously from their social engagement and gain a deeper understanding, appreciation and empathy for the societal needs. This is illustrated more clearly in a sample case study which has been included as an addendum.

6 FUTURE WORK AND CHALLENGES

There are still several issues to be resolved. Too many students still focus on "easy" targets – mainly developing web pages for on-campus student organisations. For the students that do projects outside campus, we have not yet reflected properly on the possible risks involved. These would include personal safety risks for the student, UCT's organisational exposure for inadequate or bad projects and continuity concerns with sponsors that become unavailable.

Perhaps the biggest challenge is to incorporate and provide support for the critical self-reflection that should be part of the learning process associated with community outreach projects. We hope that we can formalize this component by next year.

Given the ease of implementation of such a programme, the early successes and the low overheads of running it, we strongly encourage colleagues to implement a similar programme as part of their post-graduate student IS curriculum.

7 REFERENCES

- [1] Johnson, D.B. Faculty Guide to Service-learning. Internal Publication, Miami Dade College. Downloadable from [http://www.mdc.edu/ccci/images/Faculty%20Handbook%2012-001.pdf]
- [2] Rathswohl, E.J. "Information Literacy: A Community Service-Learning Approach" in *Informing Science*, Vol6 (June 2001): pp.187-192.
- [3] Saulnier, B.M. "Creating Significant Learning Experiences in Systems Analysis & Design: Towards a Service Learning Paradigm" in *Proceedings of the 20th Annual Conference on Information Systems Education (ISECON 2003)*, San Diego (CA): AITP.
- [4] Bloom, B.S., ed., 1956, *Taxonomy of Educational Objectives: The Classification of Educational Goals, Handbook I: Cognitive Domain*. McKay Publishing, New York.
- [5] Fink, L. Dee, 2003, *Creating Significant Learning Experiences*. Jossey-Bass, San Francisco.
- [6] Theron, H. "IS Honours students make their mark" Monday Paper, University of Cape Town, Volume 23 No 21 (2 Aug. 2004), p.8.

8 ADDENDUM: A CASE STUDY

The following is a typical example of a HOCIP project. It is quoted wholly from Theron [6] to preserve the original comments and presented here in order to demonstrate the learning and development process which students undergo during their outreach engagement.

"Nick Branco's group chose James House in Hout Bay, a place of safety, shelter and care for the children of Imizama Yethu. "They're doing a great job with the community in this informal settlement, providing mainly child care and family support," Branco said. The children's home had just bought a computing system to replace their established paper-based mode of operation. Using the technological skills, the group of Branco and team mates Andrew Klein, Richard Heslop, Gareth Edwards and Mark Meyer built a web-based system, one that was easily updateable and easy to maintain.

"The system was very similar to our final systems development project for another non-profit organisation, Warehouse, so it gave us a chance to test our skills," Branco added. Though the system they built was small in terms of "normal equivalents," it was still a comprehensive one, needing to fill all their clients' specifications. For example, tracking each child's progress in terms of

emotional and behavioural development was initially done via a paper-based system. James House wanted a computer system to assist child tracking, providing reports on the children.

"We built a computer system that made it possible for counsellors to create daily reports on each child and to view summary reports on any child," Branco explained. It also featured a built-in user access function. They are particularly pleased that all the technology they used to create the system was open-source software (free software) and the system itself was released as open-source software. The system was written in PHP4 running on an Apache webserver, using MySQL as the database. The whole system runs on a Linux server.

It took some doing. Not only did their services save James House a wad of money (they had approached a private company to set up a system), they managed to build one along the same technological lines, to do the same job, without any restrictive licence attached. "And it was free, a big plus to James House," Branco says proudly.

The project also afforded some unique insights into community work, which Branco admits he had often thought of in terms of feeding soup to the homeless. "There's nothing wrong with that, but it wasn't something I particularly wanted to do," he explained. "However, through HOCIP, we were able to see that one can help the community by using skills and talents and improving one's skills at the same time."