

Innovative Informatics Education: Aligning Theory and Practice Through Strategic Partnership

Karalee Miller^a, Denis Protti^b, Irene Wright^a, Michael Guerriere^a

^aThe Toronto Hospital, Toronto Ontario, Canada

^bUniversity of Victoria School of Health Information Science, Victoria BC, Canada

Abstract

The University of Victoria School of Health Information Science (HINF) and The Toronto Hospital (TTH) have formed a strategic partnership to align current information management theory with practical experience. The fourth year undergraduate course in Information Management and Technology was redesigned to include a joint research project with TTH. Staff from TTH were paired with groups of 2-3 students to explore current information management issues. Technology such as electronic mail and conference calls enabled timely communication. Final results were presented via video conference at the end of the term and jointly graded by the professor and hospital staff. Over the three years, a variety of projects have been undertaken and the approach has been refined. Each year offered new insight to both students and staff. Findings include several key success factors: senior level support, early planning, timely communication, access to technology, and opportunity for staff and student feedback. This partnership offers strategic advantages to both organizations in innovation, mutual learning, recruiting, and partnership. Next steps include expansion of the project to a regional model and seminars on current information management topics for TTH staff.

Keywords

Informatics Education; Distance Education; Recruiting.

Introduction

"The observation that both theory and practice are essential ingredients of professionalism was made as far back as 200 years ago by Vitruvius." [1] The Toronto Hospital (TTH) and the University of Victoria School of Health Information Science (HINF) have developed a strategic partnership to serve complimentary interests in education, research, and recruiting. [2] As part of this relationship, TTH is directly involved with the fourth year undergraduate Information Management and Technology course offered by the school. For the past three years, TTH staff members have provided HINF students with practical input into joint research projects. This paper outlines the experience of this joint project over three years and how technology has been used to enable collaboration between students and health care professionals over 3,000 miles and 3 time zones

apart.

The University of Victoria School of HINF is an internationally recognized teaching and research centre focused on the application of technology in health care settings. It is the only program of its kind in Canada. [3] The school was formally established in 1982 with the mission to improve health care delivery systems by educating individuals to be effective developers, users, and managers of health information resources; by advancing knowledge through research; and by providing a consultative service to the health care community. The school strives to prepare broadly educated individuals with a thorough understanding of the principles of information management and of the complexity of health care systems, who discover and implement innovative solutions to existing and emerging problems, are concerned with change and the management of change, and who understand the ethical and sociological implications of information technology on individuals and on organizations. [4] Co-operative education plays a significant role in this program and is a requirement for graduation. The school's research goal is to investigate new ways of applying information technology and information systems within health care organizations.

The Toronto Hospital, located in downtown Toronto, is Canada's largest academic health centre. It is an internationally recognized health science centre that acknowledges the pivotal role that information management plays in the achievement of corporate objectives. One component of the Information Management Strategy at TTH is to recruit and develop highly skilled information management professionals.

Objectives

In entering into the partnership, the University of Victoria School of HINF sought to use TTH as a "living laboratory" in which to undertake applied research, to invite TTH staff to teach students, to increase the visibility of the school in central Canada for student recruiting, and to increase collaborative research opportunities.

Similarly, TTH entered this strategic partnership to keep abreast of the latest developments in health information management, to develop the quality of staff specializing in information management through continuing education and recruiting, and to develop and advance new management techniques that improve

the quality and efficiency of its operations through the application of information technology.

Methods

Redesigning the Information Management and Technology course was the first joint initiative related to this partnership. The course was previously based in pure academic research. It now critically examines the application of information technology in the health care environment, the use of information to attain a strategic competitive advantage, new developments in information management in other industries that may be applicable in health care, and the concepts and frameworks that are evolving in the private sector. Course objectives include enabling students to:

- develop information systems plans which support the strategic and operational needs of Canadian health care facilities;
- identify the status and future implications of end-user computing in health care facilities; and
- appreciate the critical importance of managing the human side of information systems and technology.

The course was modified to assess whether the major issues affecting private sector companies are the same ones being faced in Canadian health care facilities. Topics of discussion and debate included: Do Canadian health care facilities have to remain competitive? To what extent are their processes being re-engineered? Are they taking advantage of information technology? Are the information systems departments in hospitals, community health agencies and Ministries of Health adapting to the emerging new models?

Beginning in 1995, the course placed a significant focus on the practical application of principles and concepts learned in the classroom to the health care environment. A term project worth 40% of the final grade was defined jointly by TTH and HINF in accordance with the objectives of the hospital and the content of the classroom teaching. All projects were required to address questions important to the hospital as it designed its information infrastructure. Students were also encouraged to define their own projects. One or two TTH staff members with clinical and/or technical backgrounds were assigned to each project. At the beginning of the term, the professor randomly assigned students to groups of 2-3. After selecting a project, students initiated communication with their staff contacts via Internet e-mail and participated in an early conference call to define the scope of the project and to outline objectives and methods for gathering information and analyzing data. Responsibilities of both staff and students were clearly outlined at the beginning of the project.

Student Responsibilities

- submit a one page proposal that documents the objectives, methods, and timelines;
- track time spent with staff;

- submit a 1 page executive summary of findings;
- submit a 1500 word report of findings with a separate bibliography which covers public and private sector literature;
- present findings to staff, professor, and guests;
- complete a post project assessment assignment; and
- complete a course and staff evaluation (optional).

Staff Responsibilities

- develop and outline research projects;
- assist students 2-3 hours per week with the applicability of the theory to the reality of day-to-day problems;
- provide evidence to support/contradict the literature;
- stimulate students to explore questions fully;
- track time spent with students;
- provide feedback on the project proposal;
- review communication processes and provide feedback to the group prior to the mid term review;
- participate in grading; and
- provide input into course evaluation.

TTH involved a project coordinator to liaise between the students, staff, and professor. The project coordinator played an important role in project development, issue resolution, financial management, and logistical arrangements.

Projects

A slightly different approach to the projects was taken in each of the three years. During each year, data were collected from course evaluations, qualitative assessments from staff, and project grading. Specific criteria were used to evaluate performance of staff and students. Data from the evaluations were used to provide input into subsequent years.

Yr.	Approach	Project Examples
1995	Information Management Issues	Data Security & Confidentiality Voice Recognition in Clinical Transcription Environment Reengineering the IS Dept. Relationship between Clinical Care and Billing Systems
1996	Information Management Issues or Application of Private Sector Technology to Health Care	Use of Bar Code & Radio Frequency Technologies Workstation for Research MDs Maintaining Cost-Quality Balance through Utilization Mgmt Developing a Community Information System
1997	Critique or Augment Existing Information Management Strategy	Internet Connectivity IS Infrastructure Outsourcing Customer Service Orientation Developing IS Standards

Enabling Technology

Because the University of Victoria is a significant distance from Toronto, the use of technology for communication was a critical component of this project. Students and staff utilized electronic mail, conference calls, and facsimile transmissions to exchange information. In the second and third years, video conferencing technology was used for project presentations. Costs were minimal, particularly because the Toronto portion of the video conference was sponsored by Astra Pharma Inc. in exchange for participation in the video conference and future access to University of Victoria video conferencing facilities.

Results

The variation in projects and approach provided an opportunity to identify factors that influenced the success of this initiative. Overall, five key lessons were learned over the three years.

1. Obtain Senior Level Support

Commitment from senior executives from both organizations (Presidents of TTH and University of Victoria, the Director of the School of HINF, and the Chief Information Officer at TTH) enabled allocation of the appropriate budget and staff resources required to make this project successful.

The TTH Chief Information Officer attended the final presentations in Victoria to meet with students. Several students indicated the importance of hearing him speak about this project at the beginning of the term to highlight the perspective of TTH and the significance of the research projects. [5]

2. Initiate Planning Early

Initial discussions about the project topics should begin at least six months before the course. A meeting between the HINF professor and TTH staff 3-4 months prior to the course was useful to stimulate staff involvement and to obtain staff input into project topics. The selection of research topics should be based on the perceived benefit to the hospital and the learning potential for students. If the project was of benefit to the hospital, staff were more likely to be enthusiastic about devoting time to the project.

3. Ensure Timely Communication

In the initial phase, conference calls helped students and hospital staff to outline project objectives and methodology. Students submitted proposals early in the process (within 2 weeks of the beginning of the course) to ensure that the students and staff agreed on scope, deliverables and timelines. Regular e-mail contact enabled students to consult staff about the project and staff to provide ongoing feedback without significantly interrupting either the regular work of staff or the schedule of students. Students submitted written drafts of the final report to provide an opportunity for staff to comment before the final submission.

4. Use New Technology

The video conference was an excellent tool to conclude the research project and to share findings with a larger audience for several reasons:

- students gained experience with video conferencing presentation techniques;
- staff from the hospital and Astra Pharma had the opportunity to ask questions about the research and discuss findings with the students; and
- staff and students met "in person" after a semester of communicating via e-mail, conference calls and fax.

5. Provide Opportunity for Staff and Student Feedback

Staff participated in grading the research projects. Students also evaluated the assistance they received from staff advisors. This mutual exchange of information enabled both parties to learn. The students received feedback on their ability to act as "consultants" and hospital staff learned how to improve in their advisory role. Formal evaluations allowed staff and students to identify effective processes and opportunities for improvement.

Discussion

To date, this partnership has offered strategic advantages to both organizations in the areas of innovative use of technology for distance education, mutual learning, recruiting, and partnership.

1. Distance Education Enabled By Technology

The technology utilized throughout this project enables students in Victoria to work effectively with staff in Toronto. Without meeting each other in person, staff and students are able to exchange ideas and collaborate on significant research projects. This project provides both staff and students with exposure to working with new technology that will likely be more common in the future.

2. Mutual Learning

This partnership offers both professional development opportunities for staff and enhanced learning for students. Staff have the opportunity to learn from the latest theories and research and to expand current understanding based on the findings and recommendations presented by students. Students have exposure to information management issues in a health care setting and access to persons with first hand experience with the practical application of current theory. They also are provided with the opportunity to have findings and research challenged by real world experience and the benefit of receiving regular feedback from both the professor and the hospital staff. This initiative encourages the hospital to be a learning environment—a characteristic becoming increasingly important in a competitive world. For the University, it offers an opportunity to extend the co-operative education philosophy into the classroom environment. [6]

3. Recruiting

Working on this joint project gives students an opportunity to gain valuable professional contacts and to gain first hand knowledge about the TTH environment. It provides students with much of the information they need to make a decision to relocate to Toronto and reduces the need for costly site visits. The hospital gains access to top level graduates before they

enter the market place. TTH staff are able to evaluate communication, problem solving, writing, and presentation skills over a four month period; comments from staff are incorporated into the recruiting process. Over the course of the three years, TTH successfully recruited six of the students that participated in this class.

4. Partnership

This partnership is a mutually beneficial link between three organizations. It brings TTH and HINF together several times each year to exchange ideas and to discuss future research. The involvement of Astra Pharma Inc. adds significant value because it enables the video conference and broader sharing of research findings.

Next Steps

Next year, consistent with the current trend in Canadian health care, the project will be expanded to a regional model whereby the hospital becomes a part of an integrated delivery system which includes community health, mental health, home care, long term care, and eventually primary care. In this model, the hospital no longer stands apart from the other components of the health care system.

Students will critique information management strategies of Regional Health Boards and compare them to the strategy of TTH. An additional video conference session at the beginning of the course will provide an opportunity for the staff and students to meet and to hear the Chief Information Officer speak about the project. TTH will also be completing an information management educational needs assessment with its staff to guide future continuing education activities. Based on this assessment, faculty members from HINF will give seminars to hospital staff. Investigation is currently underway to identify better methods of sharing the findings of research projects. Consideration is being given to publishing findings on an Internet Web Site.

Conclusion

This project is the first step in the strategic partnership between the University of Victoria School of HINF and TTH. Over the three years, both organizations have learned from each other

and found this initiative to be an innovative way to enhance the education of staff and students. Enabled by current technology, this initiative provides the opportunity enhance information management education through the practical application of current theory to practice.

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Address for correspondence

Dr. Michael Guerriere, Executive VP & CIO
 mguerriere@torhosp.toronto.on.ca
 BW1-658, 585 University Avenue, Toronto ON, Canada M5G 2C4
 Denis Protti, Professor
 dprotti@hsd.uvic.ca
 University of Victoria, Victoria BC, Canada V8W 3P5