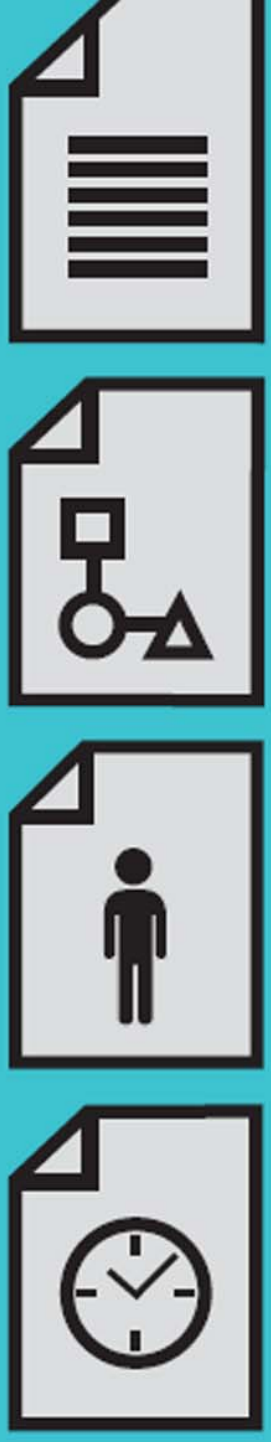

Edited by Beverly Pasian and Gary Woodill

Plan to Learn:

Case Studies in eLearning Project Management

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Plan to Learn: case studies in elearning project management

Edited by:

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Gary Woodill, Ed.D.

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Chapter 1

Introduction

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Compiling a book of case studies needs two things - a critical subject area and excellent authors. Everything else falls naturally into place. Both criteria have been met in exceptional fashion for this volume.

The current generation of eLearning projects (those since 1995) have been managed using various methods to varying degrees of success. To this, we posed a question: Why? Certainly there are many answers but the one on which we have focused is project management. In more traditional fields, this area has included both the strategic organizational issues as well as those at more tactical project levels – the processes, methods, techniques, rules, principles, languages, and resources it takes to complete things. With respect to eLearning projects, we can see no difference. Strategic vision and commitment along with accurate and professional day-to-day execution go hand in hand.

The issues affecting the management of eLearning projects have not, until now, been the focus of any dedicated analysis. This volume represents the first step toward achieving a greater understanding of the management of eLearning projects on the part of an international group of researchers. The analysis has revealed a combination of (somewhat) predictable observations and surprising revelations. While each chapter sheds its own light on one or more of these themes, all are described below.

Project management processes should be in place at the beginning.

Project teams can get the most benefit from the structure, planning and accountability that PM can offer if they are in place from the start. Some of the key elements that the eLearning project managers found helpful included identifying the project's purpose, the decision-makers and accompanying processes, and the goals, milestones and deliverables of each project phase. Taking this approach enabled PM's to focus on what was achievable, and not what would have been great to do.

Evaluation tools should bookend a project.

Project management tools and mechanisms can be very useful in keeping the project grounded and closely tied to the initial objectives set out in the project plan. Closing this loop—by determining whether or not the objectives have been met—involves creating and implementing an evaluation plan that might involve myriad elements through the life of the project (e.g. alpha and beta tests, pilot program).

Relationships are key to managing eLearning projects.

This was one of the dominant themes in almost all the chapters: ensuring that all project team members, stakeholders and end users should be kept in the loop from the beginning. Communications and expectations have to be managed all through project life cycles for each team member. It's very easy for misunderstandings: information flow is especially important where the technology/ pedagogy/project trio exists. Taking clear

action in order to maintain good relationships—by involving representatives from high-risk groups early in the process, for example—is critical.

Training and preparation are needed for faculty and learners.

It is unrealistic to expect that everyone participating in an eLearning project will be familiar with the online environment and the technology or application being used in your project. To accommodate the learning curve, time is needed for everyone involved to prepare themselves for their specific role or activity. Preparation will, however, mean different things to different people. Faculty, for example, may not be familiar with the challenges of communicating online (initiating messages and responding to others) and will require dedicated training. Conducting needs assessments and planning for this training is helpful. Profiling them as "technology safaris" is another way of highlighting a group focus, rather than on the particular needs of one person.

Where learners are concerned, don't assume that they all enjoy online learning. Most are probably familiar with the technology, but (based on some of our project teams) they may not prefer it to more traditional methods. Overcoming this additional barrier becomes a very real challenge to the eLearning project team. Scheduling additional time to conduct pilot testing is one way of addressing this need.

Risks need to be managed, particularly for relationships.

Everyone with experience in managing elearning projects can testify to the problematic relationship between those responsible for technology and those responsible for pedagogy (or "content"). Conflict seems inevitable between these groups and this represents a potential risk to the management of the project. The question should no longer be how to avoid conflict in relationships, but how to manage them constructively. Conflict, even anger, are perfectly natural—even reasonable—responses in many situations, but it's the fear and subsequent need (on the part of some) to avoid these situations. Risk needs to be mitigated, reduced, managed and sometimes avoided but only as part of a larger risk management strategy.

Project leadership is important.

Leadership in an eLearning project is dominated by two roles: the project sponsor and the project manager. Their relationship is critical, as are those they have with the remaining team members. These roles define the vision, objectives, milestones and success for the project. It is the remaining team members who help them achieve it.

Articulating the project vision to the team is a critical function of the sponsor and supported by the manager. The members rely on these statements as touchstones to ground their activities over the subsequent weeks and months of the project work. But once those statements are made, the sponsor and manger are further needed to motivate the team, negotiate on their behalf (where necessary) and generally balance the various interests of the project stakeholders and team members against the realities of the eLearning project environment.

The project manager is the most complex role, generally relying on a combination of specialized technical, administrative, pedagogical and subject matter expertise.

Communications and information flow must be well-managed.

Project communication should be open and transparent, and the flow of information should leverage Internet technologies. The goal should be to maintain a level of awareness concerning project developments amongst all stakeholders all the time. Too often key project personnel unilaterally make the decision to filter information, leaving vested parties dissatisfied with project updates. As an alternative to making decisions on behalf of stakeholders regarding how much information they need, elearning project members have demonstrated more progress by sharing as much information as they have to enable project stakeholders to make relevant decisions for themselves.

Managing projects = managing change

Projects create change. It's a certainty that the organizational landscape will be different by project's end, and the only question to focus

on, from a project management perspective, is how this will happen. Various tools, methods and resources are available to support the project management team.

Organizational change, on the other hand, requires a more holistic approach that is separate from—but not detached from—the project management activities. In many ways, these are parallel developments and require conjoined efforts in areas such as strategic planning and communications.

eLearning project management is a learning experience.

eLearning project management is an experience particularly well-suited to sharing the knowledge expertise it develops. Many project environments use communications tools on a limited basis and then only for the project in question. eLearning projects, on the other hand, use technology (email, the Web, file-sharing applications) created specifically for the purpose communication or learning. Their use requires minimal effort on the project team and demands little in the way of behavioural changes. These cases demonstrate how project management and stakeholders can regularly share project updates with little or no change to their operational activities.

The perspectives offered in these cases speak to multiple--and truly global—themes. Written by 29 authors from 8 countries, these observations make a strong case for the global awareness of and commitment to elearning project management. Over time, more research will emerge pertaining to elearning project management with an eye toward examining the relationship between the quality of project implementation and that of the actual learning. Put another way, to what degree can each of these themes [read: factors]—and others to be identified—directly impact the quality of the learning experience? While there is little more than anecdotal evidence to suggest that this supposed impact is significant, additional research is needed to investigate and document the relationship. Actual impacts and their meaning will follow. As an initial step, bridging the gap between the elearning and project management communities through these case studies is beneficial to all.

Good management *can* lead to good learning.

Chapter 2

eLearning Project Management: a review of the literature

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Before specific literature on elearning project management existed, elearning projects were usually classified as software development (if they were categorized at all). Any project management approaches to elearning would have generally been based on generic project management principles, or on several standards specifically designed for software development. These included standards for software development set out by the International Standards Organization (ISO), based in Geneva, Switzerland, and by the Software Engineering Institute in the USA. Applicable standards include ISO 9000-3 on software development, and the protocol on software process assessment, ISO 15504 (Zahran, 1998). The SEI approach was a five level Computer Maturity Model (CMM) for Software (Humphrey, 1989).

As well, the Project Management Institute provides a model—known as the "Project Management Body of Knowledge (PMBOK)—that is more generic and rooted in historical project management initiatives in the fields of defence, architecture and engineering. It has been adopted by—but not adapted to—several other areas, and is now being looked at by a few practitioners in the elearning community. However, this new application of the PMI model isn't generating a new approach specifically designed for elearning projects. Rather, the PMI model is being used almost intact (and sometimes after the fact) to explain what should happen or has happened in the project. Using the PMI model as a diagnostic tool rather than a prescriptive force is a misapplication of its value and, especially for those pedagogical and technological experts in the elearning community, a lost opportunity to benefit from the structure it offers. Adapting this model to reflect the needs of elearning professionals would be highly valuable for two sets of professionals: those responsible for the pedagogy of elearning as well as those responsible for its implementation.

Not surprisingly, an extensive literature on elearning project management doesn't exist. Only one book on the subject (Shackelford, 2002) has been published, a few articles, and a lot of what librarians like to call "ephemeral materials". The latter include company brochures, corporate white papers, conference presentations and speeches, blog commentaries, and online articles which have not been published in printed form. Again, as in the case of the PMI materials, there are enormous gaps in the literature on elearning project management. Little exists in the way of models for them to follow or best practices (or lessons learned) for them to benefit from.

The accompanying literature review is somewhat abbreviated and is mainly based on a search through the archives of the Educational Resources Information Center (ERIC), a government funded service that collects educational literature (well over 1 million pieces to date), searching engines such as Google and Alta Vista and leading academic journals in the areas of project management

and educational technology. A content analysis of this material gives a picture of the present state of elearning project management in English speaking countries, and highlights the need for further theoretical, analytical and critical work in this field.

eLearning Project Management Methodologies

Because there is no theoretical base for project management that is specific to elearning, many people placed in the role of project manager for elearning turn to established approaches designed for other types of projects. Shackelford (2002) contends that the most traditional system for elearning project management is probably the "waterfall" method adopted from software development, which is described as having the following phases:

- Definition and approval of a set of requirements
- Creation of a timeline and budget to produce the deliverables defined in the requirements phase
- A design and implementation phase to produce the deliverables
- A post-mortem to evaluate success and failure in producing the deliverables on time and on budget (p. 6)

In contrast to the waterfall method, Shackelford advocates for "the elearning project development cycle". This method recognizes that "changes are not only inevitable but desirable as well" (p. 6). Because of this, the development cycle method includes the revisiting of the deliverables by all parties and the possibility of making adjustments, as several points in the project. The rest of Shackelford's book is devoted to the details of the elearning development cycle method, including a set of templates for managing projects.

Toenniges (2004) provides, in a virtual book format, her more than 20 years of elearning project management experience, as well as a useful set of templates for managing elearning projects. Templates include:

- Pre-Start-of-Work Agenda Template
- Start-of-Work Agenda Template
- Work Plan Template
- RASI Exercise Template
- Various Tools for Quoting
- Project Change Notice Form
- Change Management Models
- Status Log Templates
- Guidelines for File-Naming Conventions
- Project Style Guide
- Quality Assurance Checklists
- Reproduction Specification Forms

Kruse (2004), who calls himself the "elearning guru", suggests the following are the usual steps in a successfully managed elearning project:

- Vendor is providing a single point-of-contact project manager.
- Weekly progress meetings are held.
- Detailed project schedule is created and routinely reviewed.
- A prototype is created, tested, refined, and finalized early in the development process.
- Major content changes are made in scripts and storyboards.
- Development process parallels the Instructional Systems Design process.

Eseryel, Schuver van Blanken, and Spector (2001) also provide templates and design guidelines for elearning project management, as part of an overall elearning design package funded by the European Union.

A few vendors have developed relatively sophisticated approaches to managing elearning infrastructure implementation projects. Mitchell and Woodill (2005) describe in detail the process whereby Konica Minolta Business Systems in the United States switched from one learning management system to another, using collaborative project management and change management procedures (for details, see Chapter 3). This approach is similar to the one advocated by Morrison (2003), who calls for an *e-learning delivery team* headed by a steering group. In his chapter on project management, Morrison argues that the team must have enough people in it with skill sets to manage the overall initiative, the vision and strategy, the project plan, finances, technologies involved, customers, content, knowledge management aspects, learner support, project processes, change procedures, and human resources.

Brookwood Media Arts, an elearning software and web developer, outlines their approach to project management on their website (http://www.brookwood.com). Stages include:

- Effective Communication
- Design Description
- Project Cost Estimating
- Project Scheduling
- Work Authorization
- Project Status Tracking
- Client Review and Approvals
- Change Control

Other writers on elearning project management advise clients on how to select and manage vendors, certainly an issue in any elearning project that uses outside suppliers for technology, content or services. Hartley (2001) gives a "Supplier-Viability Checklist" in his article on avoiding the pitfalls of elearning implementation. Grossman (2005), in a recent presentation, includes these steps in vendor management as part of an overall ePM strategy:

- How to select a LMS vendor
- The importance of focusing on key requirements
- How to work successfully with your LMS vendor
- How to help subject matter experts adjust to the LMS environment
- Project management dos and don'ts
- How to do cost-effective usability testing of your LMS

Howard (2004) warns of four major pitfalls to be avoided in any LMS implementation:

- Lack of specifications of reports and data before project starts
- Difficulty in making changes in an application – often easier to change your business than to change the software
- Lengthy projects – by the time a long project has finished, many things have changed.
- "Pleasing everyone pleases no one". The process of software implementation often exposes conflicts within an organization that need to be resolved before the project can proceed.

According to King (2001), elearning implementation can highlight a "clash of cultures" within an organization, especially within academic institutions. She notes that "elearning projects may be characterized by clashes of culture as academics adapt to technology, as educational managers become change agents, as early adopters are forced to convert their online teaching materials from one implementation platform to another, and as university computer resource departments become central to real-time delivery of teaching, learning and assessment."

Use of Software in ePM

Because elearning is centred on software, it is not surprising that there are those who advocate using software to manage, or at least partially manage, an elearning project. As early as 1997, Bartoli was advocating for the "automated design of interactive courseware," using reusable pre-built multimedia elements from a database. But, because such objects are decontextualized, the automatic building of elearning elements for a project has not proven to be very successful.

General project management software, especially MS-Project, is often used in larger elearning projects. Noble (2005) recently reviewed a set of "high-tech and low-tech" tools that could be useful in elearning project management. Noble sees project management as having five elements of project control – Tracking, Reporting, Review, Analysis, and Approval, and suggests tools for each element. Lockitt (2000) also reviews software useful for project management in training and education.

Training for ePM

For Harnett (2002), beginning to be an elearning project manager is learning a vocabulary, learning to "talk the talk". However, for many, elearning project management is more a set of skills needed to see a project to successful completion. McLoughlin and Luca (2002) describe the need for an online training program for elearning project managers. Except for the proposed Certificate in eLearning Project Management at the University of Calgary that I'm trying to build, there does not seem to be any specific formal training program entirely devoted to ePM. Rather, project management of elearning is usually a part of degrees in eLearning, Distributed Learning, Online Learning or Distance Education, or can be a subject in degrees in general project management.

Case Studies

A number of case studies of eLearning project management can be found scattered throughout the literature in edited books on distance education or elearning in general.

Bradley (2001), for example, describes the process of delivering an online Masters degree in the workplace, using a large-scale distributed collaboration approach. The University of Salford (2003) presents issues in the implementation of elearning within the National Health Service in the UK. Ellsworth and Iorizzo (2001) outline problems encountered with the implementation of elearning in the US Army. Napierala and Tveskov (2002) discuss the development of an in-house elearning project at a non-profit agency. Koller, Frankenfield and Sarley (2000) provide insight into implementing elearning in a hospital. Several authors (e.g., Gaylord, 1987; Harr, 2002; Hodgson and Lam, 2004; Uys, Nleya, and Molelu, 2004) write about managing elearning projects in higher education settings. Cases in the higher education community remain limited with Kenny (2001-04) being one of the few to offer insights to the challenges and solutions in a university setting.

ePM Standards

Finally, a few articles discuss critical issues related to elearning project management. One is the fact that there are no agreed upon ePM standards. Gauder, Christie and Strong (2004) refer to the well-know Capability Maturity Model (CMM) of the Software Engineering Institute as a direction for the ePM industry, calling for organizations doing this work to rise to a "level five" standard. Manford and McSporran (2003), and Marshall and Mitchell (2002), also suggest that elearning project managers follow the CMM model. Hodgson and Lam (2004) call for "quality management" of elearning projects.

In summary, there is not an extensive literature on elearning project management, per se. This review shows that much work needs to be done to further develop this growing sub-field of project management practice.

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Chapter 3

Managing the Creation of an Online Math Tutorial for Nurses

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Abstract: The creation of an online Nursing Math Tutorial was in direct response to a growing need for students in the Undergraduate Nursing Program at Mount Royal College to relearn basic mathematical principles for the purposes of Intravenous Therapy and Medication Administration in the clinical setting. This case study describes the phases of development used as a project management methodology in the development of the online Nursing Math Tutorial and reflects upon the challenges and lessons that were learned as a result of managing the production of a student self-assessment learning tool.

Key words: Project Profile, Learning Object Typology and Scoping, Project Charter, Storyboard, Template, Maintenance Guide, Signoff Document, Surveys and Assessments

An astonishing number of Canadians die each year at Canadian hospitals due to inadequacies in the administration of medication and what hospital administrators are defining as "adverse vents" (Enevold, 2004). According to a May 2004 study published by the Canadian Medical Association Journal, one in nineteen adults will be given the wrong medication or dosage upon a hospital visit (Paul Harte Professional Corp., 2004). Inappropriate dosage calculation is the result of errors in mathematical medication calculations. These disturbing facts were the catalyst for the development of an online Nursing Math Tutorial.

At Mount Royal College, the Undergraduate Nursing Program has identified a deficiency in students' ability to do basic math. This issue is related to the fact that students initially learn to complete basic mathematical operations on their own in elementary school, but they then come to rely on calculators to solve mathematical problems in the higher grades. According to Alberta Learning, "...students continue to achieve excellent results on international tests, sharing the highest scores in reading, improving from third to second in mathematics and ranking fourth in science"(Alberta Learning, 2004). Based on these statistics there appears to be a "disconnect" between the Alberta Learning international test results, the reality of "adverse events," and student mathematical performance upon entering the Nursing Program at Mount Royal College.

The online Nursing Math Tutorial was initially created for use in the Undergraduate Nursing - Program at Mount Royal College. The intention of the project was for students to use the tutorial as a resource for studying and becoming more proficient at applying basic math skills to practical nursing situations, in the hope of diminishing the dismal statistics identified by the Canadian Medical Association Journal.

Prior to the development of the online Nursing Math Tutorial, students wrote math tests before and during each clinical course. Preparation for these tests was through self study and with the assistance of practice worksheets. Some of the concepts were difficult to grasp when students had not yet been exposed to the equipment associated with specific procedures and were not able to use a calculator in the testing environment. If students failed to attain 90% on their math test they were required to seek remedial help and re-write the math test. For both the students and the instructors, this procedure consumed a great deal of time. The goal of the online Nursing Math Tutorial was to ensure that nursing students were successful in their clinical courses without the need for so much time.

In the design and development of the online Nursing Math Tutorial, there were a number of project management challenges. Those which are described in this chapter include: restructuring team roles, hiring a multimedia student intern, and applying theory and practice. This goal of this chapter is to explain the challenges, the solutions sought, and the lessons learned in developing and managing the online Nursing Math Tutorial.

The Online Nursing Math Tutorial

The online tutorial is composed of four modules;

1. Basic Math Review
2. Medication Administration and Label Reading
3. Intravenous Therapy and Medication Administration
4. Pediatric Medication Administration and IVs

Each module is divided into sections and within those sections there are Macromedia Flash animations that demonstrate the application of mathematics to a specific issue, practice problems with answers, and explanations. Students also have access to self-study pre- and post-assessments for each module. The pre and post assessments are located within the Blackboard Course Management System and are designed to test students on their knowledge and understanding of the math concepts demonstrated in each module.

The Flash animations for Module 1: Basic Math Review, highlight and demonstrate basic math principles that will assist students throughout the remaining modules as well as refresh their understanding of math concepts. The Flash animations (e.g., Insulin Administration - Module 2, Reconstituting a Powder to a Liquid - Module 3, and Administration of Medications for Pediatric Use - Module 4, as shown below in Figure 1), reiterate and apply the math concepts from Module 1 and demonstrate the application and relation between math and nursing techniques.

The pre and post assessments for each module are housed within a Blackboard site and provide automatic feedback to students. The assessments reduce the in-class time required to distribute and administer the quizzes/tests and are used to assess student understanding of the material.

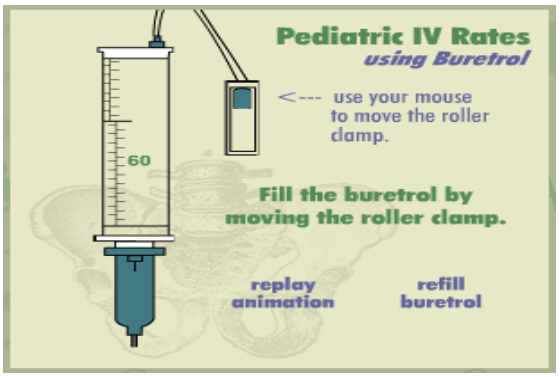

Figure 1: *Macromedia Flash animation example from Module 4 "Administration of Medications for Pediatric Use"*

The online assessments are designed to increase opportunities for practice and learning by allowing students to re-take the assessments as often as they need or wish. All assessment marks are archived and allow the instructors to track student progress as they work through the tutorials.

The practice problems are located within each section of a module. The intent of these problems is to give students the opportunity to practice their skills within that particular section. Answers are provided so students can check their work. If they have trouble with the calculations, they can either work through the tutorial again, or proceed to the Blackboard pre- and post-assessments where specific feedback on the calculations is provided.

Developing a Project

For all educational technology projects developed in Mount Royal College's Academic Development Centre (ADC), the Instructional Design (ID) Team follows a project management plan based on six phases of development. The Instructional Design Team does not think of this core process model as something permanent and stable, but rather, as something that is fluid, transitional, and continuously evolving. The process evolves as new technologies emerge and old ones fade, as the skills, needs, and expectations of students and instructors change and grow, as we continue to experiment with new methods and learn from our mistakes. (Academic Development Centre, 2002)

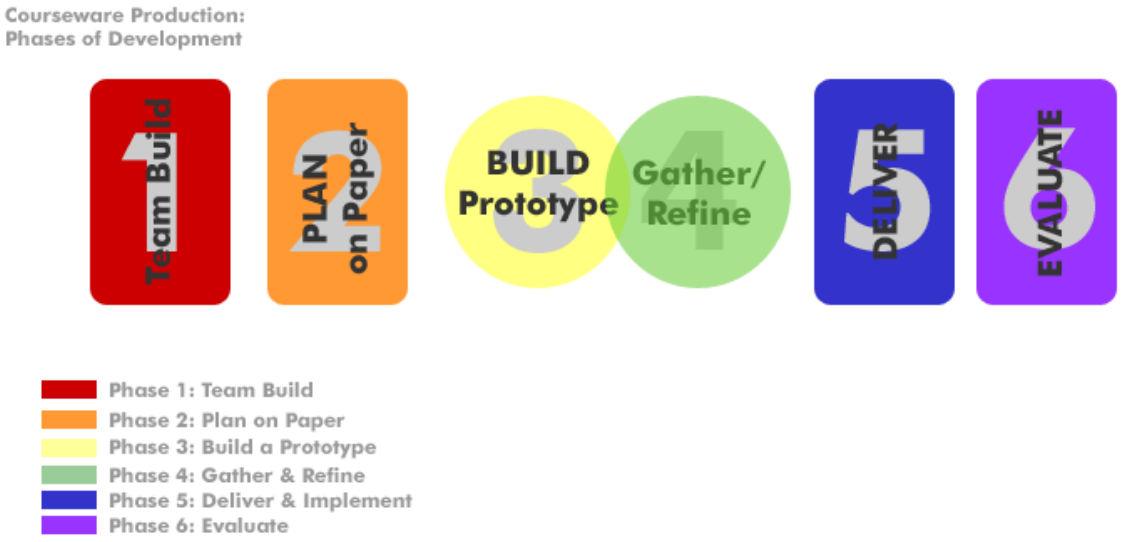

Figure 2: *Phases of Development for Educational Technology Project Production*

The core process model, as illustrated in Figure 2 and outlined in Table 1 below, consists of six phases that are fundamental to developing any type of web-based educational technology project at Mount Royal College.

Each educational technology project developed at Mount Royal College is unique in its design and delivery. The phases of development remain consistent throughout all projects; however, their differences emerge with regard to project challenges and solutions. The online Nursing Math Tutorial had its own unique project management challenges.

Restructuring Team Roles

With every educational technology project, content presentation varies based on the audience, student learning styles, and project structure. For the online Nursing Math Tutorial the audience was identified as primarily eighteen to twenty-five-year-old female students.

The initial project structure was based on the understanding of the project objectives, which suggested that the structure should be a stand-alone website accessible to students from any computer with Internet access, and developed in an easy to use, concise, and clear format.

Although all of these elements appeared to be consistent with the traditional online course format, the actual development of the tutorial proved to be somewhat outside of these boundaries. The content for the tutorial had to be written in a step-by-step format, rather than in textbook paragraph style. The intention of the tutorial was to provide practical information to the learner, that being the basic principles and illustrations of math sequences and their relation to practical clinical settings.

As the content was submitted to the Instructional Design Team it became evident that the format of the Subject Matter Expert's content was not representative of a tutorial style of writing as it was extensive in length and too detailed for a web-based course tutorial. Initially, the Subject Matter Expert included too much detail about the sequences of the math applications, which was inconsistent with the stated project objectives: to be concise and clear. For the content within the tutorial to be pedagogically effective, the ID Team determined that the mathematical principles and nursing application procedures should be formatted into step-by-step instructions and that Flash animations could be used as a descriptive, narrative component to augment the instructions.

Both lack of time and limited resources were critical factors in the development of the online tutorial. Due to the amount of content within each module, it was decided that the team needed to recruit someone with editorial expertise to assist in reformatting the content to make it suitable for web delivery. The solution was to utilize the ID Team's Instructional Technology Programmer for the purposes of

editorial work. Her background was in technical writing, and given the limited programming scope of the tutorial, the team was able to use her expertise within the project. As the editor, she re-wrote and formatted the content into step-by-step instructions and assisted in storyboarding the animations using the detailed descriptions and narratives written by the Subject Matter Expert. From a project management perspective, the solution of extending the responsibilities of team members was both financially advantageous and resource savvy.

Although restructuring team roles can cause duplication at times, it was a viable and creative resource solution to the challenge presented. Not only did it enhance the role of the Instructional Technology Programmer, but adding an editor to the ID Team enhanced the quality of subsequent courseware development projects. As a result of this particular challenge, the Instructional Technology Programmer/ Editor created a content style guide for the Instructional Design Team for future projects. Each educational technology project developed at Mount Royal College is unique in its design and delivery. The phases of development remain consistent throughout all projects; however, their differences emerge with regard to project challenges and solutions. The online Nursing Math Tutorial had its own unique project management challenges.

Hiring a Student Multimedia Intern

Upon initial scoping of the animations required for the online Nursing Math Tutorial, it was evident that there was the potential for more than sixty animation sequences within all four modules. The ID Team works on a series of projects throughout the academic calendar year, and given the lack of resources and time, and previous commitments to other projects, developing over sixty animations in a short time period was inconceivable. However, before cutting back on the animation sequences, the team took time to reflect upon the project objectives.

It was evident to the ID Team that in order to create a tutorial that was fully capable of illustrating and describing the detailed mathematical principles associated with clinical nursing techniques and procedures, a large number of animations would be necessary. Due to the large volume of educational technology projects in development throughout one year, the team needed to scope the online Nursing Math Tutorial in relation to the other projects in development. It was evident that the Instructional Technology Graphic Artist, who was also responsible for the interface and website development of the tutorial, would be unable to effectively complete the animations for the delivery of the tutorial.

When there is a problem with a lack of resources it is important that the project manager bring all team members together to brainstorm and reflect on project priorities. Upon reflection, it was decided that the team would seek out a student multimedia intern to complete the animations. Fortunately, Calgary is home to a number of technical institutions, and therefore, finding a student intern was not difficult. This was an affordable solution as the intern was required to complete an internship for course credit and as a graduation requirement. When developing high-quality educational technology projects, hiring an intern can be risky. The intern hired for the project was working in exchange for a course credit and possible career connections, therefore it was necessary that the intern be accountable to complete the project requirements. It is important when hiring an intern that the project manager treats the hiring process as any other hiring of a team member. A proper portfolio should be shown and competence of technological skills exhibited. To ensure the successful completion of the online Nursing Math Tutorial deliverables, the project manager/Instructional Design Consultant created a contract that outlined the intern's role and responsibilities in relation to the project, as well as a detailed project schedule that identified the animation sequences needed. Proper scheduling and reporting structures helped to ensure a successful internship for the student, and the development of an effective educational technology project in the end.

Applying the Theory to the Practical Experience

The most difficult task faced by the ID Team was determining how to illustrate the clinical setting experiences. In a face-to-face experience, students have the opportunity to go to the experimental clinical setting at Mount Royal College and practice medication administration using the equipment in the lab. However, the experimental lab is not open after hours and therefore, we had to duplicate the experimental lab setting for an online environment. The project objective was to give students self-assessment opportunities, regardless of location.

Phase of Development	Main Activities	Required Documents
Phase 1: Team Build	Identify team members and resources. Initial brainstorming and review of the Project Profile.	Project Profile Learning Object Typology and Scoping
Phase 2: Plan on Paper	Finalize ideas, set goals, establish time-lines. Identify roles and responsibilities for each team member. Outline module structure. Fill in Storyboard Templates. Make Project Charter.	Project Charter Storyboard Template
Phase 3: Build a Prototype	Begin develop-ment of the external web-site, multi-media, and Blackboard Course Man-agement site. Edit and format content.	Project Charter Storyboard Template
Phase 4: Gather and Refine	Gather final pieces of information and/or content. Add final touches to the project. Complete production of the Project Charter. Create Maintenance Guide.	Project Charter Maintenance Guide
Phase 5: Deliver and Implement	Hand off the project from the Instructional Design Team to the Subject Matter Expert.	Maintenance Guide Sign Off Document
Phase 6: Evaluate	This is an ongoing process that occurs while the project is implemented. The project is generally evaluated by students within the course or program, as well as Instructors.	Surveys and Assessments

Table 1: ***Phases of Development Main Activities and Required Documents***

Where the difficulty arose was in the ID Team's own lack of knowledge with regard to the practical application of medication administration in relation to math skills. The Instructional Technology Graphic Artist and Multimedia Intern had successfully completed the animation sequences for the modules related to basic math skills, but it was time to bridge the gap between the math principles and the application in a clinical setting. Within phases 2 and 3 of the development stages, as described in Figure 2 and Table 1, the Instructional Design Consultant and Subject Matter Expert storyboarded the animations desired for the course. After more than three storyboard attempts detailing Intravenous Therapy and Medication Administration for adults and children, the process was still difficult to understand as a developer. Time and resources were running low and it was imperative that the team find an alternative solution to describing and visually representing the sequence of medication administration in the clinical setting. The solution was a "Nursing 101" course for the Instructional Design Consultant and the Student Multimedia Intern.

Without proper understanding of the series of applications required within each animation, the animation would not be effective and could possibly illustrate unsafe and false medication administration procedures. Both the Instructional Design Consultant and Multimedia Intern went to the experimental lab setting and were guided through each sequence of medication administration. Along with descriptions and detailed instructions on the use of each machine and administration technique, the team took digital photographs of each stage. Each photograph was then loaded into Adobe Photoshop and re-traced for use within the animation sequence developed using Macromedia Flash. Although the process of storyboarding the remaining animations was not consistent with the previous storyboard templates, gaining a stronger understanding of nursing procedures was an important process for the Instructional Design Team. From a project management standpoint, although the process of learning new skills took time away from project development, it enhanced the effectiveness and understanding of the effort the development team put into the animation sequences. Taking the time to understand the subject of an educational technology project can reduce restructuring time and allow for the creation of an extremely effective and coherent tool.

Conclusion

There are challenges within every educational technology project that is created, developed, and implemented in higher education. It is the creative solutions to those challenges that form a unique and successful educational project. Regardless of the challenge, the primary goal within all projects is to place the learning process and content at the forefront of the development. In the creation of the online Nursing Math Tutorial, the successes arose from creative project management solutions, which conserved resources and maintained a higher quality of student learning as a result.

Lessons Learned

Do Restrict Team Roles
Identify the needs of the project and assess the required technical, editorial, and design skills needed to complete the e-learning project. Take an inventory of team members' skills sets and utilize the diverse talents on a team rather than inhibit the production of a project based on predetermined roles.

Investigate Alternative Resources
Rather than prohibiting the creation of an effective multimedia tool based on a lack of resources, investigate alternative resource options. Hire a student intern as a work study. This is a resourceful solution to completing a project on time and task and in assisting a student with future career plans.

Learn the Basics before building the Complex
If the content of the e-learning course is foreign to the developer and the project management team, learn the basics and fundamentals of the course content. It is important that content drive any e-learning course and it is the responsibility of the developing team to have a fundamental understanding of how the content drives the multimedia.

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Note:
The Nursing Math Tutorial is currently available in CD-ROM format through the Mount Royal College Bookstore, http://www.mtroyal.ca/bookstore/ .

Chapter 4

Flexmasters: developing elearning project management skills

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Abstract: This chapter addresses the *Flexmasters* elearning project and the lessons learnt by two project managers in their eighteen-month journey, undertaken in a campus-based, regional university in Australia, to project manage five fully online masters programs from conception to implementation. The extension of their existing project management skills and knowledge into the eLearning area resulted in the creation of eLearning project management tools and strategies that worked across multiple project teams and resulted in the achievement of the overall project objectives. Various eLearning TIPS relevant to project management practitioners will be highlighted throughout the chapter.

Key words: eLearning project management, postgraduate programs, change management, lifecycle model, eLearning tips, faculty communication plans

The eLearning project commenced in 2001, when the Vice Chancellor's Advisory Committee of the University of Canberra, Australia implemented online delivery for a set of full fee-paying priority masters programs in an effort to extend the student base, to develop new income streams and respond to market-oriented pressures. The overarching institutional goal was to make the project work within the existing pedagogical framework and to deliver the outcomes on time and on budget. Five teams comprising 20 faculty were invited to move from teaching in a traditional face-to-face environment to a fully web-based team-delivered approach, co-operating with one central team of designers and other support personnel. A lead time of 12 months was allocated to prepare the project strategy, plan and resources.

The learning materials were conceived as traditional distance education packages: a collection of printed booklets together with a Website using the University's Learning Management System (LMS), WebCT. The printed materials were usually three booklets: the **Study Outline** (a complete description of the curriculum document), the **Study Guide** (the core content of the learning package; various self-assessment (formative) exercises, and guidelines about how to complete the online component and the summative assessment), and the **Book of Readings** (journal articles and book extracts reproduced for students under the University's statutory CAL licence). Faculty were encouraged to use the **WebCT site** for interaction (student-to-student, student-to-lecturer) and constructivist activities. The WebCT site was configured to include links to various University services and facilities (the Library, University policies, administrative information), and PDF versions of the printed booklets.

Roles of the project managers

The university funded the establishment of two new central University structures, the Flexible Delivery Development Unit (FDDU) and the Flexible Delivery Support Unit (FDSU) within the existing faculty development Centre for the Enhancement of Learning, Teaching and Scholarship (CELTS). In relation to this investment they appointed two key staff; the Central project manager (CPM) in the central Flexible Delivery Development unit and the Divisional project manager (DPM) in the Division to oversee the project implementation.

The role of the Division project manager

The senior faculty appointed within the Division as Divisional Project Manager (PDM) had extensive publishing, budgeting and project management experience. The level of appointment was significantly senior as it allowed the DPM to communicate at an appropriate decision-making level within the University. Reporting directly to the Divisional Pro-Vice Chancellor the DPM had a 'clean slate' to work with, substantial collegial support, but no real power or authority. A budget of $100,000 was allocated to the DPM for advertising and promotion, development of materials and hiring of support staff. Protocols for managing the course budget, administering the project, establishing guidelines for Divisional quality control, setting marketing goals, in addition to offering technical advice, strategic support, promotional and promotional activities were part of the DPM's responsibilities (see Figure 1).

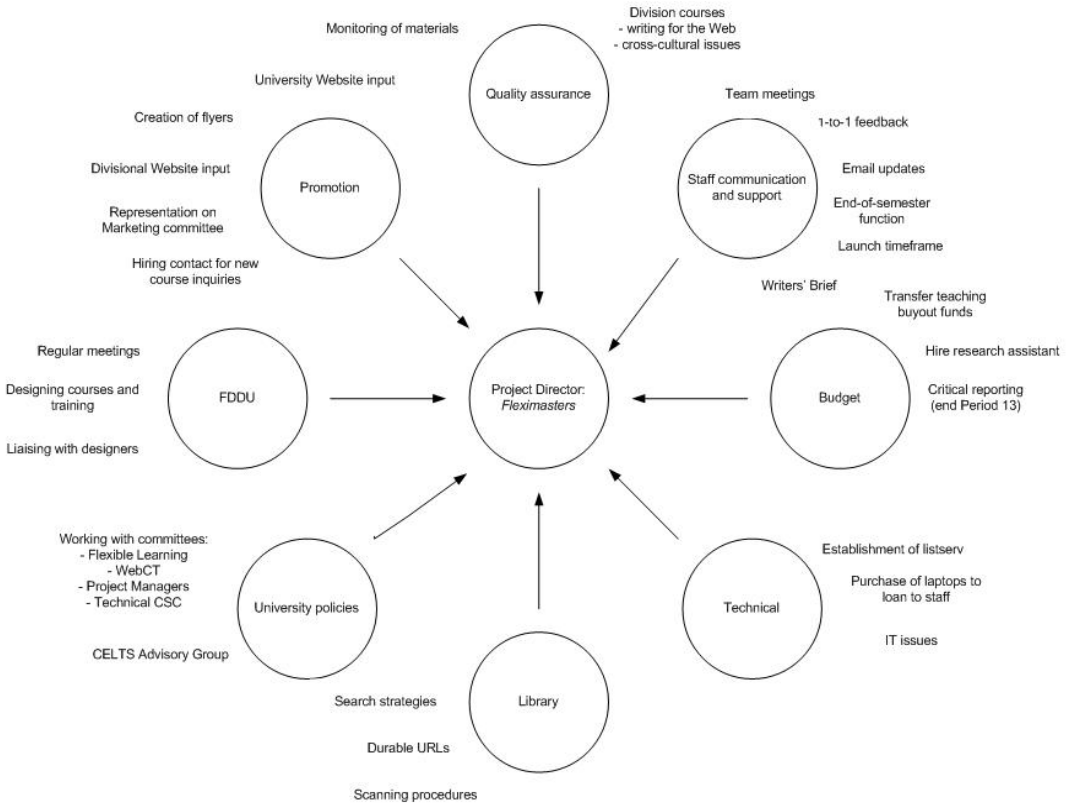

Figure 1: Flexmasters *Divisional Project Director's role as conceived in Division of Communication & Education*

With such diverse roles and responsibilities strategic planning was essential for project success.

eLEARNING TIP

- **Ensure project managers are appointed at suitably high level within the organizational hierarchy**

Role of the Central Project Manager (CPM)

The production / publishing team comprised the Central Project Manager (CPM), one instructional designer and two graphic designers, one print-focused and one Web-focused. The sustainable operational process was designed according to key milestones, and remains very similar nearly four years after the establishment of the project. As well as setting up central project management Gantt charts out-lining tasks, milestones and timelines, the CPM allocated responsibilities within the FDDU, and negotiated and helped to communicate responsibilities outside the unit.

The most difficult aspects of the project became increasingly obvious as the CPM and the DPM both realized that they were carrying responsibility for major change management within the organization. They were required to establish new teams and publishing processes, communicate new responsibilities to faculty, and at the same time convince everyone that their work was adding value to the students' learning experience. Both managers regularly supported staff by making sure that everyone involved in the project was reminded frequently about the overall objectives and importance of the project, and how their contributions gave the project impetus toward successful attainment of the agreed goals.

eLEARNING TIP

- **Encourage all group members to work towards common goal**

Lifecycle approach

A brainstorming session between the CPM and the DPM resulted in the adoption of the lifecycle model, tasks, timelines, deliverables, resources and key milestones which were subsequently entered into Microsoft Project for circulation via email and reporting to stakeholders. A key output of the initial planning was the *Flexmasters* Project Master Schedule that followed a six-phase pattern of development for each learning package.

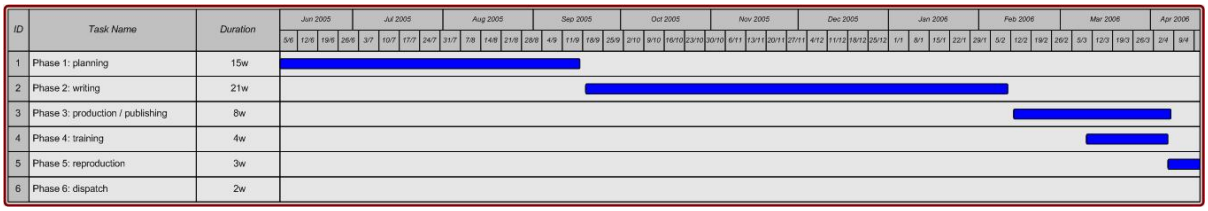

Figure 2: The stages of development for each learning package of the eLearning project

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This precedence-styled diagram illustrated the critical path methodology adopted. A short detailed analysis of the six phases follows.

In *Phase 1: Planning*, a period of up to 15 weeks, starting 12 months before students started studying the subject. The broad parameters of the packages were identified, and the structure of the printed materials, down to headings for each section, and the types of formative activities provided. The FDDU team would discuss editorial / technical issues, like the preferred referencing style, and deadlines would be agreed.

During *Phase 2: Writing*, which took up to 21 weeks, the writer was encouraged to attend WebCT training workshops, and to maintain contact with the instructional designer. The University had been using the WebCT LMS for several years, but had kept no record of which faculty had attended training workshops. Therefore, although the publishing team strongly recommended that WebCT training workshops and seminars in teaching online be mandatory for all faculty writing and teaching the *Flexmasters* subjects, these workshops and seminars remained optional.

eLEARNING TIP

- **Try to mandate essential pre-requisite training courses**

Phase 3: Production / publishing was allocated eight weeks in the schedule. Sometimes materials passed through this phase quicker than that, and sometimes they took slightly longer, but eight weeks remained the average. Once the writer had completed the scripts for the printed materials (and had, ideally, conceptualized the online formative assessment activities); the scripts were reviewed by the instructional designer. The instructional designer completed a detailed report on all aspects of the learning package and made suggestions for changes and improvements to both the learning materials, and to the design of the curriculum. This served to develop the quality assurance aspects of the project.

Phase 4: Training was included to give faculty time to learn how to use WebCT and other technologies. This phase was allocated four weeks (overlapping with the production / publishing phase).

Phase 5: Reproduction took up to three weeks, depending on printer's schedules and *Phase 6: Dispatch* of hard copies; population of student WebCT databases, and moving WebCT sites to the "LIVE" area of server took about two weeks. The writers, the CPM and the DPM checked the page proofs and signed-off on them before print orders were placed. These materials were then converted to PDFs or HTML and uploaded to the WebCT sites that had been prepared. The faculty who were later to teach, (often but not always the same people as the writers) were then advised to create their Assignment Drop boxes (for electronic submission of assignments), their electronic markbooks, and complete any other tailoring of the WebCT site required. Assistance was provided during this process, and faculty signed-off on the WebCT sites before they were made live and students given access.

Change Management

The staff located in the Flexible Delivery Development Unit (FDDU) had one of the most difficult jobs at the University: to assist faculty to develop materials in time for a publishing process that was untested within the institution. In offering more flexible learning options to students, the University changed the nature of teaching from an essentially private and ephemeral affair to a highly public matter. A clash resulted between the faculty culture, the creative culture of the graphic designers and the publishing culture as all were forced to work to non-negotiable deadlines.

To manage this change more sustainably the FDDU collected data that assisted, informed and updated both the writers and faculty. The weekly circulation of the Gantt chart showed the progress of all learning materials. The Gantt chart displaying color-coded 'on time/behind time' submissions (those writers who had completed on time and those with work outstanding) and was, in itself, a crucial peer motivator. The integration of these charts as part of the project subsystem served the purpose of educating those involved in the venture of project management methods and protocols, and was instrumental in the change management and reporting process.

eLEARNING TIP

- **use peer pressure and the natural competitive tendencies of the team of writers to keep the entire group on schedule**

This tool was similarly utilized to inform key project champions (Divisional Pro-Vice-Chancellors etc) of 'on time' and 'on budget' progress. By ensuring that the project champions remained convinced of the success and value of the project, the project success was more likely.

eLEARNING TIP

- **ensure upward feedback occurs to stakeholders/project champions**

What lessons have been learnt?

The implementation of the project plan required a strong communication and coordination emphasis. Throughout the project the CPM and the DPM met weekly to coordinate, compare, chivvy, de-stress, motivate, coerce and congratulate staff and each other. They acknowledged and

recognized the changes the team members were experiencing and did their best to ameliorate tense situations as and when they arose. Through constant communication, weekly conversations, formal and informal meetings between the two key managers, strategies were developed and implemented that supported individual staff in unique ways (either through additional research support, editorial support or writing support).

An open, relaxed style of communication exhibited by both managers served to break down initial staff reservations toward the new project. (Without a sense of humor the project outcomes may have been in jeopardy.) The DPM worked with the 20 faculty, unused to eLearning in any form, and established an information sharing process during regular Team meetings; weekly email updates; functions, such as the official Launch of the project, mid-semester updates and final launch; electronic communication discussion boards; and individualized one-on-one support. It was these conscious early decisions to share information, to set up open communication patterns (through meetings, telephone conferences, systematic emails and internal listserves, accessible websites and electronic file sharing) that set the tone for the project.

eLEARNING TIP

- **set up and publicize communication responsibilities / patterns early together with opportunities for public rewards to be acknowledged**

Both project managers acknowledged the use of the carrot and stick approach with faculty – 'carrots' included time-in-lieu or the lure of desirable publications etc; whilst 'sticks' included things like the embarrassment of seeing that you are the only one late with your script, or being called to 'please explain' by your Head of School for missed deadlines..

eLEARNING TIP

- **Use carrots and sticks appropriately to motivate staff**

Were deliverables met?
On the whole, yes. The processes and procedures developed for the elearning project *Flexmasters* are now used more widely and have impacted upon University-wide policy decisions. The quality assurance methods, processes and standards that were implemented raised awareness of eLearning activities; protocols and project processes strengthened the quality of the materials and ultimately ensured the continuation of the project. In terms of the development cycle over 85% of the faculty / writers met their due dates – of the remainder in the initial round of development, one set of learning materials was withdrawn until the following calendar year and another was developed in modules and forwarded to the students in three parts.

What of the remaining 15%? With the wisdom of hindsight, having 'backup' staff in case of family illness would have been wise. An issue that still remains to be solved is the development of an agreed strategy to deal with the situation that arises when a subject's availability has advertised, students have enrolled, and then the materials are not written in time. In a small University, this can be a major problem. In many cases, cancellation is not an alternative. [Recently the University has been exploring alternatives to the learning package as it was originally conceived (detailed print booklets + WebCT site). For instance, now options exist to have a minimal Study Guide, where the writer has written a "wrap" which guides students through a sequence of previously published textbooks, textbook extracts, journal articles, and learning activities over the period of the semester. This typically takes less time to write than the more detailed Study Guides originally prepared.]

eLEARNING TIP

- **embed alternate strategies for contingencies**

What could have been done differently?
Flexmasters evolved in a 'deadline-driven' manner, with solid initial support from key upper-management personnel / project champions, but without articulated upper management/stakeholder acknowledgement of the need for suitable sustainable systems to be in place. ELearning project management skills and knowledge were assumed to be present in the personnel appointed to carry out the project, rather than being recognized and implemented by the institution as a whole.

While *Flexmasters* certainly required / requires project managers, it is debatable

whether or not it falls into the traditional understanding of a "project", with a fixed end point. It is probably more like an experiment that is in the process of morphing into the mainstream activities of the institution. With hindsight, perhaps the project may have been better to have been conceived as one that introduced change. That is, to have two phases to the project: firstly, the introduction of non-face-to-face teaching and the resultant necessary up-skilling of personnel and implementation of new operational units, and secondly, the integration of these processes and procedures into mainstream University operational activities. It helps to have the goals of the project clearly articulated early on, and for these to be re-visited frequently. It is essential to ensure that everyone understands why this work is important, and that it needs to be supported.

Of even greater importance is that with significant personnel changes in the senior management team of the University and related changes in organizational priorities, came a loss of some of the project's champions. Both project managers noted a negative impact on the way the project was supported, about two years after its initiation. Although project managers often faced a daunting task as middle managers, it was important to ensure that there is an ongoing review / evaluation of the status of such projects within the institutional framework. If that had been managed better for this project, it may have been reconceived earlier and aspects mainstreamed much sooner.

So what tips can be shared from this elearning experience?

A project's success or failure should be attributed to the philosophy of management that is carried out during the project life cycle, by the strategic managers who have responsibility for the continuous oversight of the project and by the project managers who have responsibility for the completion of the project's costs, schedules and objectives (Cleland and Ireland, 2002, p. 398). Using project management alone will not guarantee project success. Indeed, "many professionals in the education and training communities have gone beyond the excitement of elearning as something new and now regard it as something that needs to be managed, along with everything else in their learning and training portfolios" (Pasian and Woodill, 2005, *pers.cor*).

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Chapter 5

Creating the Instructor Toolbelt: Managing and Planning eLearning Faculty Development at a Technical Community College

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Abstract: Pellissippi State Technical Community College has steadily increased the number of online courses and web-enhanced courses offered to students. In addition to selecting a course management system, the college has also acquired several other instructional technology tools over the years to offer to faculty. These combine to create a "faculty toolbelt" for online teaching and learning. The position of Instructional Technology Specialist was created to be the project manager for support activities and training for faculty using these tools. This case study examines the growth of the program and looks in-depth at one aspect of supporting the faculty "toolbelt": the planning and development of a support web site. As well, it provides conclusions about this type of project management in a two-year college environment.

Key words: Community College, Course Management System, Faculty Development, Instructional Technology

"Every contrivance of man, every tool, every instrument, every utensil, every article designed for use, of each and every kind, evolved from very simple beginnings." - Robert Collier

Pellissippi State Technical Community College (PSTCC) is located in Knoxville, Tennessee and serves almost 8000 students across four campuses. The school has been a technology innovator. In 1993, it was the first community college in Tennessee to provide email accounts for faculty and students and it launched its first online course in 1996. Growth of online and web-enhanced courses has been strong as seen in Figure 1, *Growth of Online and Web-Enhanced Sections (1999-2005)*.

With more academic materials offered online, the information needs of the increasing number of students and faculty using the technology can be distilled into the following categories:

- **awareness** of instructional technology tools available and their appropriate pedagogy
- **familiarity** with the available support options and other procedures
- **user training** on the tools
- **knowledge** of technical requirements for the tools

One decision made to meet these needs was to develop a faculty support project. This case study will focus on the planning and process for providing a faculty "toolbelt" of instructional technology that has occurred over a five year period as seen in Figure 2: *Creating the Faculty Toolbelt*. A major emphasis of this chapter will be on one task: the development and creation of a faculty support web site.

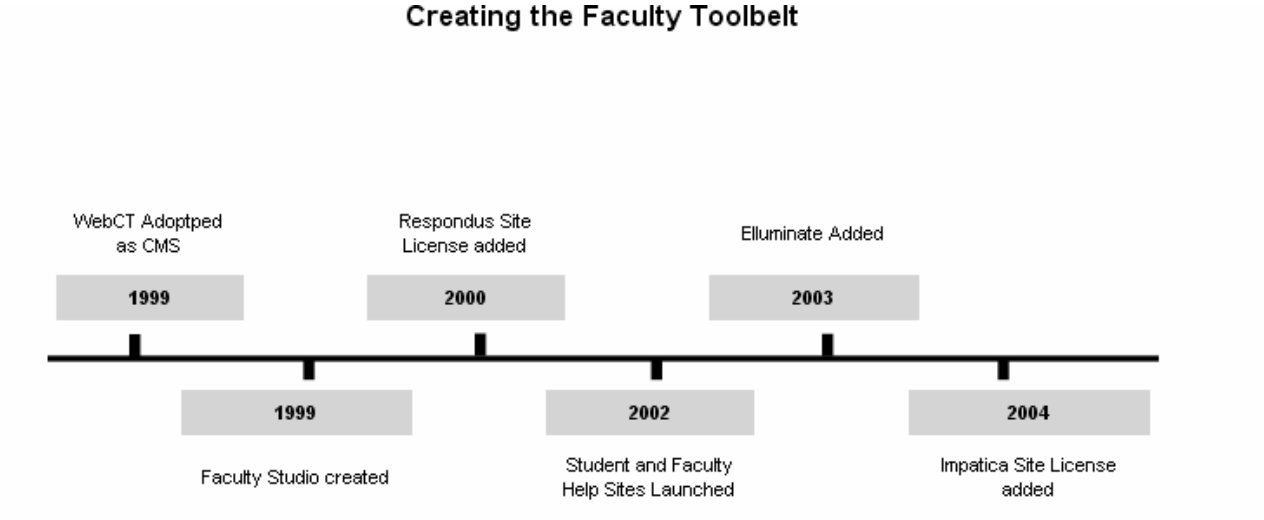


Figure 1: PSTCC, Educational Technology Services 2002; PSTCC, Educational Technology Services 2005

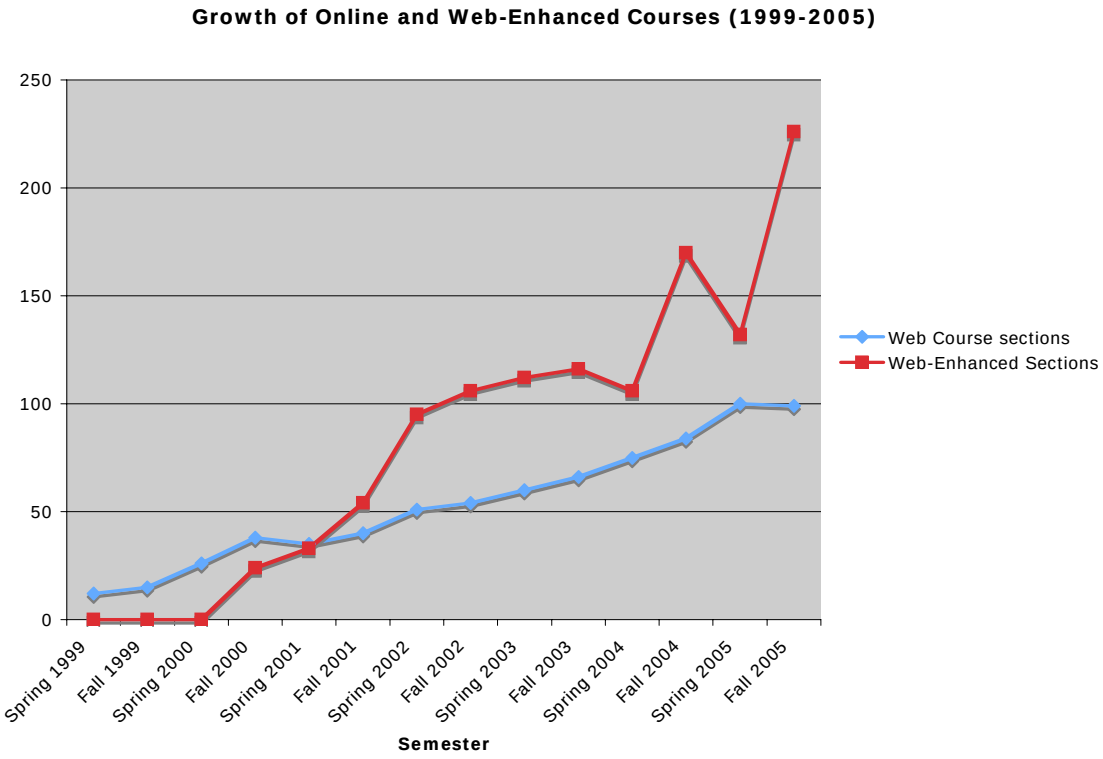
Project Description

The school's early online classes were basic web pages planned and supported on an *ad hoc* basis through a partnership with faculty and existing educational technology staff. The initial timeline for this process was relaxed and involved a team approach with the faculty serving as content experts and educational technology staff creating the sites.

After several semesters, the rapid growth of online courses made it obvious that they needed to be managed differently than the *ad hoc* system. The faculty "toolbelt" evolved from that need. Following an extensive review process, a course management system (CMS), WebCT, was adopted in 1999 and became the first tool to be added to the faculty toolbelt. This expanded the faculty role from acting mainly as content expert to the additional expectation of becoming course designer. Demand for new courses also shortened the timeline for preparation and development.

After the CMS selection was made, the management and planning process became complex enough to justify additional staff. The new position of Instructional Technology Specialist was charged with creating a central point for planning and managing user training while also working with technical staff to support the course management system. A dedicated computer lab, named the Faculty Multimedia Studio, was added to the toolbelt for training and development activities and is managed by the Instructional Technology Specialist.

On-ground instructors quickly adopted WebCT to complement their classroom work, as the first "web-enhanced" courses appeared in 2000. This type of online teaching brought in a group of inexperienced instructors who wanted to leverage technology quickly for a variety of reasons, including reducing the amount of class time used for quizzes and sharing grades with students. *Respondus*, *Elluminate* and *Impatica for PowerPoint* have all been added to address faculty needs for tools to assist them in creating online materials and assessments.



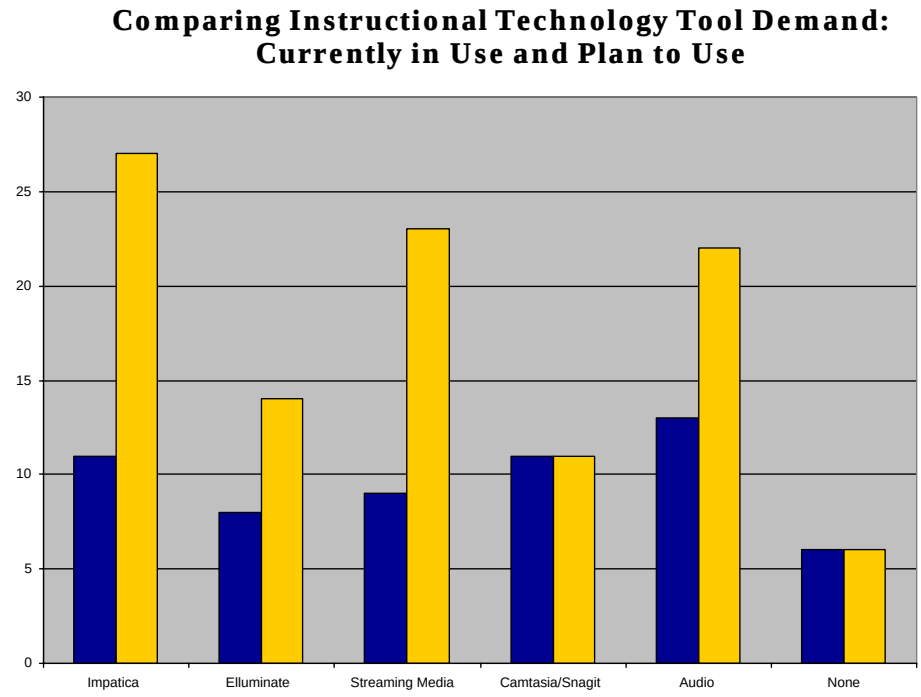


Figure 3: PSTCC, Educational Technology Services 2004

All of these tools are seeing faculty acceptance with an increase in use expected over the long term. In an annual survey of faculty using WebCT, the use of the "toolbelt" was addressed with questions about the current and anticipated use of the tools. Figure 3, *Comparing Instructional Technology Tool Demand: Currently in Use and Plan to Use*, illustrates this increase.

Project Scope and Goals

Managing this growth required planning not only for faculty development but also for student orientation, rapid course development, anticipation of additional training needs, technical support, exploring other tools, such as podcasting, and creating or revising college policies and procedures. All of this became a part of the scope of this faculty support project.

In this project, the work is planned, developed and deployed with the Instructional Technology Specialist as the project manager working alone on some aspects and with varying teams at other times. These teams are composed of other Educational Technology Services (ETS) staff as well as employees from Networking & Technical Support (NTS), Library Services and the Dean of Instructional Programs, as well as academic department heads and interested faculty members. The particular configuration of personnel depends on which aspect of the project is being examined or developed at the time.

The mission of ETS is to support the use of technology in the teaching/learning process and this is the overarching goal of the project (PSTCC, Educational Technology Services 2005). Because the success of a computer system is reliant on its users being able to learn how to use it quickly and without significant trouble (Preece *et al*. 1994, 156), it is reasonable to extrapolate that the same is true for an instructional technology project. This is the objective for creating the faculty "toolbelt": planning and maintaining a set of tools and support that is easy for faculty to access. The project objectives are then based on success of faculty using the tools, in both technological and pedagogical terms. For Educational Technology Services' part of this project, goals are measured by growth in the distance learning program including increasing the number of web and web-enhanced courses as well as the numbers of students and faculty involved.

Activities

The "toolbelt" project involves several coordinated activities that must be planned as each technology is deployed. As stated, the central location for oversight is within ETS, with the Instructional Technology Specialist as project manager. With the growing amount of information online, information professionals are discovering a shift towards creating information products to simplify and assist access (Guenther 2000). Due to faculty time constraints, much of the support needs to be self-service. Creating these kinds of products is a large part of the activities of the project manager in this case.

Focusing on one task will illustrate the planning process used for such an information product. The faculty help web site supports many of the "toolbelt" aspects at Pellissippi State and has its own milestones and deliverables. This project component requires the same type of project management approach as the larger support project itself:

- defining the target audience & stakeholders,
- identifying information needs,
- determining scope,
- addressing technological issues
- developing project objectives & timeline
- site architecture & creation
- site testing & project evaluation

Defining the stakeholders

It is important for any project to identify who has an interest (stakeholder) and who will use the final product (customer) to determine the user needs and get feedback to ensure success (Richman 2002). For the overall project of supporting online teaching and learning, the stakeholders include students, faculty, helpdesk staff and others. For this particular task, the main customers will be full-time and adjunct faculty members at all campuses. The stakeholders include technical support staff and early adopter faculty who act as "*stealth resources*" (Starrett and Rodgers, 2003). Since the site will not be required to use the "toolbelt," the customer will be self-selected so the site must capture and hold their attention.

Defining the needs

Specific project objectives are the result of anticipated, felt and expressed information needs as defined by Kemp, Morrison and Ross (1994). All of these needs are related to improving the faculty's initial experience with WebCT and the instructional technology tools.

Anticipated needs: Anticipated needs come from looking to the future. Since one of the assumed causes of failure with using technology in teaching is frustration with technical issues and lack of information, it is anticipated that the need for training and support will continue to grow as the number of first time online instructors increases each semester. Additionally, the vendor frequently updates the course management system. This usually results in an interface change and can cause confusion for faculty, even those familiar with the tool. Anticipating continued growth and software updates establishes the need for the project to be quickly responsive to change and widely available for the changing number of users. Being flexible is crucial, as "planning for change is as important as planning [a] change." (Starrett and Rodgers, 2003).

Felt needs: A felt need, according to Kemp, *et al* is a "desire...that an individual has to improve...performance...of [a] target audience" (1994, 23) The ETS staff feels the need to assist faculty and improve their success with the distance learning since students and faculty look to this department for answers on instructional technology information needs. This directly relates to the overall project objective of improving the successful use of technology in teaching and learning.

Expressed needs: Expressed needs are felt needs "turned into action" (Kemp *et al* 1994, 23). Providing faculty a means of "verbalizing" felt needs helps identify the actions to meet them. As part of the planning process, the annual faculty survey referenced earlier along with users group meetings also provided input. By determining what professors say they know and do not know and comparing it to what technical staff identify, a comprehensive approach is possible when planning support options.

Defining the scope

As the "toolbelt" project developed, it became only one part of a much larger online effort for providing support for online education at Pellissippi State, including students, faculty and technical support staff. This larger effort will provide customized support options based on role and involve the use of previously developed, but underutilized, materials. The web site project being described was targeted to the faculty just starting with online teaching at the school, as well as those who are looking to expand their "toolbelt" with the "latest and greatest" or to refresh their skills.

Addressing technological issues

When the project was first initiated, the technological decision was to develop a CD-ROM for faculty members. The initial plan for the CD-ROM included providing software installers to help faculty at home with slower Internet connections or less technical savvy on locating and downloading the appropriate files. However, during preliminary planning meetings with the administration team of the Networking & Technical Services department, it was determined that resources were not in place for producing the CD-ROM on a bulk scale or for supporting faculty having technical questions at home. In addition, with the rate of updates to software, it was unrealistic to expect the CD-ROM could be kept current in a cost-efficient manner (Foust 2002). Due to these limitations, the project plan evolved into a web based resource containing the tutorials and other information as well as links to the installers for programs provided in the "toolbelt." Choosing the web for delivery allowed for easier maintenance, fewer support concerns for the HelpDesk and less budget impact for the school.

Defining Objectives and Timeline

From the felt, expressed and anticipated needs, and the defined scope and identified topics, the following goals and objectives for the web site project were developed. The project will:

1. provide a central location for all WebCT related faculty support materials and resources.
2. focus on both novice and experienced online teachers and their expressed needs.
3. provide information on other technical issues about teaching online as necessary
4. use formative evaluation to determine future growth and improvements as user needs change.

The timeline for producing the site was established to be over a three month period in the summer when the course load and faculty training demands are much less for the department. The first two months were for site design and creation and the last month for testing and adjustments.

Site Architecture and Design

In this phase, information design comes into play as topics are prioritized and organized. The information needs outlined above fit into four main modules, identified as:

- **Getting Started**: including system specifications, a Frequently Asked Questions (FAQ) document and a means to test the user's browser for compatibility
- **Using WebCT**: containing multimedia tutorials and handouts
- **Helpful Downloads**: links to download sites for web browsers and other software used in web courses
- **WebCT Information**: a central location for WebCT Users Group (WUG) minutes and other faculty resources

The site was designed for linear navigation, as well as for serendipitous browsing. Relational links were established between the sections so a user could leave one easily and start another. In addition, a site map allows visitors to quickly scan the topics and find the page most relevant to his or her need.

Since the faculty members had to be able to move through the space without additional guidance, it was important that the architecture reflect an apparent navigation and the ability to skip around without becoming lost or confused (Mok 1996, 114). The four main user questions to answer are: "Where am I? Where can I go? How will I get there? How can I get back to where I once was?" Planning the architecture to provide easy answers for these questions reduced the time to get familiar with the site and allowed for easier access to information (Fleming 1998, 5-13). The final step in the architecture phase was to create a site plan and a checklist of the assets needed for each section.

The design stage of the project allowed for the most creativity, as the information needs are matched with a look and feel that is aesthetically pleasing and easy to use. The design followed the guidelines created by the Coordinator of Web Authoring Services at the school (Smith 2000). Cascading Style Sheets (CSS) were used to provide a flexible means for wholesale changes to the site. Other planning decisions were made considering standard usability guidelines for navigation and way-finding within web sites (Preece *et al.* 1994, 89). *Figure 4, Example of Faculty Help Site Page Design*, shows a screenshot to illustrate the design approach.

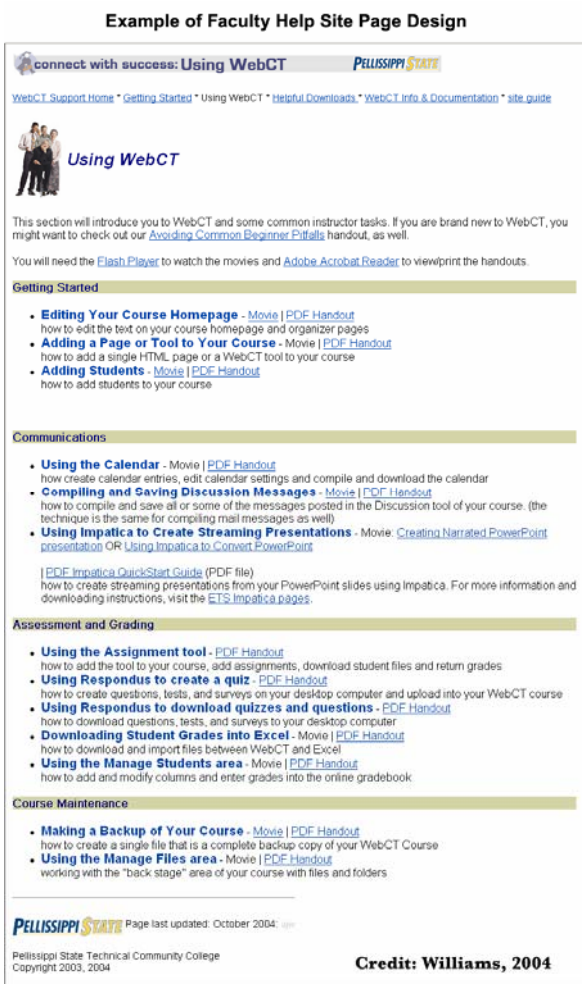


Figure 4: Example of Faculty Help Site Page Design

The technical issues for this project encompassed where to host the site and decisions about the multimedia delivery system and were influenced by the previous stages of the project.
It was decided that the site should reside on the same server running WebCT and the online student support site. The location provides a user-friendly URL (***webct.pstcc.edu)*** and establishes an easy "one stop shop" for faculty, staff and student support for all online teaching/learning.

In a previous project (the student support site), four different media delivery systems were explored with the following factors in mind: budget impact, cross-browser and

cross-platform compatibility, production time and difficulty, compliance with the Americans with Disabilities Act (ADA), user interface and the media delivery system. At the time, a Java based solution was selected. With this project, the decision was made to change all tutorials to Macromedia Flash, thereby providing a common platform for support and development.

Novice computer users prefer to have "cheat sheets" as they learn new software to reduce the pressure of knowing where to click while concentrating on the subject matter (Goldsborough 1999). To help alleviate this problem, the project was planned to contain printable handouts to create a customizable toolbelt reference manual. It was decided that Adobe's Portable Document Format (PDF) would be the best choice for distribution for these handouts in order to keep image fidelity and layout flexibility.

Project Testing & Evaluation

As stated by Preece *et al.* (1994, 601), "[w]ithout doing some form of evaluation, it is impossible to know [if] the design...fulfils the needs of the users." A consideration for this project is how it will evolve and respond to the changing information needs of its users. This required a plan for the short-term assessment of the project as well a long-range plan of evaluation of both site functionality and the project's success of reaching the departmental goals.

Before the site went "live," it was tested on the Macintosh and Windows platforms using all of the supported browsers recommended by WebCT. Beta testers were volunteer faculty teaching during Summer 2002. Based on their experiences, adjustments were made before offering it to all faculty members in the Fall 2002 semester.

Assessing design while it is in the real world is one purpose for evaluation of systems (Preece *et al.* 1994, 604.) Formative evaluation was used to capture data on usage, usefulness and usability as to continually improve the site. Server logs provided basic usage and error information. By discovering any difficulties users have, the site can be altered as necessary. As part of the continuing departmental evaluation of its services, the annual faculty survey will be changed periodically to study the effectiveness of the tutorials. Feedback will also be solicited regarding topics of interest to instructors to identify new tutorials and refine current ones to make the site more useful. From the 2003 survey, issues of most interest to faculty included creating more online tutorials and providing support for adding multimedia to their classes. In 2004, almost half of the respondents specifically mentioned one or more of the more recent "toolbelt" additions as needs. The site has been expanded to meet those requests.

Looking at the increase of both online and web-enhanced courses along with the number of students involved illustrates success toward departmental goals for distance education. The site is one task within the larger project of faculty and student support for instructional technology and, as a large component; it has been deemed a success by both the ETS staff and the faculty who provide formal and informal feedback.

Conclusions

The project described above has provided several lessons about the planning and deployment of various tools in the faculty "toolbelt."

One lesson involves the culture of higher education and of community colleges in particular. Because more than half of community college faculty work part-time, it is important to include full-time and adjunct faculty in planning and deployment of any technology project (Parsons 1998). Another consideration is the fact that faculty are busy! Typical course loads for full-time community college faculty include five or more (often different) classes. Any support planning must take these cultural realities into consideration. When the project first started, plans included requiring training of faculty before they could use the course management system or other tools. Due to faculty time constraints, it became apparent that training could not be required. Instead, self-service options took the forefront with formal training offered for those wanting more structure. This model does present a challenge of time management for the single staff member charged with planning the project as well as working with the very different schedules of full-time and adjunct faculty who wish to participate.

In addition, a template of the online course structure was created in hopes to streamline production and provide a common look for all

online courses. The culture of higher education is strongly rooted in academic freedom, however, and a very quick lesson was learned that most instructors do not want to have teaching decisions handed to them. Instead, multiple course templates were created that fit a variety of desired uses. These templates help streamline development but provide the flexibility required by faculty.

Because of time pressures, another lesson learned has been to provide multiple avenues of information sharing. Users group meetings were initially well attended and provided a great means of communication. As attendance waned and faculty at distant campuses started using the tools, other mechanisms had to be employed. Now, communication with the users is done via email and the faculty web site described above, along with more traditional methods. The project has also started using some of its own distance learning technology to provide training. The continued challenge for the project is keeping current faculty engaged and willing to learn more about the tools, while bringing new users into the environment smoothly and with minimal frustration.

Another cultural aspect unique and beneficial to Pellissippi State is the fact that the institutional organization places Educational Technology Services in the Information Services division along with Networking & Technical Support, Library Services and Application Programming Support. This type of organization has proven to be a positive for planning faculty support projects because lines of communication are clear with all of the stakeholders. Larger colleges and universities frequently have different organizational structures which can separate educational technology from the more infrastructure oriented divisions, such as networking or even the more academically oriented, such as library services. This can cause more difficulty in communication or planning with colleagues and could increase response time to support issues as well as the timeline for deploying new technologies.

The model used for managing the support for online faculty at Pellissippi State is one that maintains a very central focus for Educational Technology Services with essential support from Networking & Technical Support and others. One staff position, the Instructional Technology Specialist, acts as the project manager as well as the production staff. This role requires a mix of technical, instructional and interpersonal skills. It is much like Eric Schröedinger's 1944 *What Is Life?* statement that the chromosome contains “architect's plan and builder's craft in one,” as one has to have a bird’s eye view of the entire plan as well as manage the more detail oriented aspects of the project. Despite the somewhat daunting description, it is a model that works.

Any person who takes a position similar to the Instructional Technology Specialist as described in this case study will most likely have a mix of technical and pedagogical skills. Project management, as a formal course of study, is not necessarily a part of the training required of such positions. It is, though, an important skill to nurture, as much of the work in this field is project-driven. Developing these abilities is a matter of drawing on the skills already in place such as writing goals and objectives or organizing media assets for a multimedia project. Information architecture or web development skills can also be recruited to help with project management as they encourage planning, evaluation and creating realistic schedules and budgets. Learning to ask the right questions, keep good records of events and evaluate as you go along all help provide for strong project management and, in return, strong final project results (Hobbs 2000).

All in all, however, the proof of success will be in the data collected as part of the institutional effectiveness plan. In the past, emphasis had been placed on getting courses online quickly. Now, with the initial rush of development slowing, time can be taken to be more reflective on the process as well as the product of online education. Developing projects like this is just one way to steadily improve the skills of our faculty in online learning and, therefore, improve the entire student experience at Pellissippi State.

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Chapter 6

Insights from Managing a Multi-faceted College eLearning Project

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Abstract: Elearning project management is a relatively new discipline. In higher education, many educators have learned the skills required for managing an elearning project "on the job" with little, if any, formal background in the area. This case study describes an elearning project involving the development of an online version of the Foundations of College Mathematics course (MTH149) at Seneca College, in Toronto, Canada. The goal was to develop an online math course that was both rich in media and rich in instructional design to create an active online learning experience for students. The course was successfully developed, with much learning for the development team in the process. This case discusses project management issues related to online course development, including scope, resources, and milestones, and the insights gained through the process. Part of the success of the project involved learning from the development process and applying these "lessons learned" to future elearning projects and practices at the college.

Key words: Budget, deliverables, elearning, institutional culture, instructional design, learning objects, milestones, multimedia, online course development, project management, project team, resources, scope

The mid to late 1990s were interesting times for educational institutions with respect to computer technology. A number of factors were at play: 1) educational technology was coming into prominence, 2) institutions were busy building technical capacity (network infrastructure, broadband access, electronic classrooms, learning labs, learning commons, research initiatives, support systems, administrative and academic systems), 3) the term "elearning" was finding its way into institutional strategic plans, 4) the supply and breadth of technologies available to institutions, fuelled by the "dot com" revolution, was increasing steadily. There was a sense that technology was the catalyst for change and that it would spawn a new teaching and learning paradigm. Academe would never be the same.

The extent to which the promise of computer technology has come true (to date) is up for debate. Nonetheless, change spawned by technology has had a noticeable impact on educational institutions. Innovations such as online services, course management systems, portals, content repositories, learning objects, distributed learning systems and the like have all become (or are becoming) commonplace. Managing these innovations has forced educational workers to develop a new set of skills. It should come as no surprise, then, that we are now formalizing a relatively new specialty: elearning project management.

An online version of the Foundations of College Mathematics course (MTH149) at Seneca College (Toronto, Canada) was developed in the late 1990s. This project has provided those involved with valuable insights into elearning project management. Much of what happened during the process has filtered through into current elearning practice at the college. This chapter describes the process and insights gathered from the management of this project.

Project Objectives, Scope & Process

The development of the online version of MTH149 was one of the earliest elearning projects at Seneca College, and it has had an important impact on how subsequent elearning projects have been approached, managed, and designed at Seneca. The project goal was to develop a pedagogically sound, media-rich online math course that would be interactive, inviting, self-paced, flexible, and effective.

The MTH149 course was identified by Seneca's Faculty of Continuing Education and Training (FCET) as a priority for online development, as part of its strategic planning process. The planning process began with an initial description of the project, followed by the identification of a subject matter expert (SME) to develop the content. In the case of MTH149, two SMEs (each having expressed an interest in developing an online course) were identified and decided to share the course development load.

At the time of this project, the college had a centrally funded centre, the Centre for New Technologies in Teaching & Learning (CNTTL), whose role it was to work with SMEs in developing online content. The CNTTL was composed of instructional designers, multimedia designers, technical experts, and production people. The project was assigned to one of the instructional designers in the Centre (who also acted as the project manager). As part of the process, a contract outlining the terms and expectations for the work was drawn up. Having a contract or detailed letter of agreement between the sponsoring department and the development team is strongly recommended to ensure everyone involved is clear on expectations and responsibilities regarding outcomes, timeframe, and costs (Bates, 2000, p. 73; Lockitt, 2000, p. 13). The agreement also provides the project manager with something to fall back on if aspects of the project begin to lag.

The project began with an initial meeting, lead by the Instructional Designer / Project Manager. Discussion included:

- The overall project goal
- The overall timeframe (4 months) and what needed to be accomplished by when
- The learning outcomes, and the grading scheme (the learning outcomes would remain the same as the in-class version, but the grading scheme would reflect the different types of activities used in the course, with less emphasis on testing)
- Meeting schedule (essentially weekly)
- What resources (e.g., textbooks) would accompany the course
- Team responsibilities (to ensure each person's role was clear).
- How each section of the course should be structured
- Examples of media to explore (this involved looking at other websites and other courses developed at Seneca, and discussing what was possible in terms of current multimedia development)

While many questions remained unanswered, the first meeting set the tone for collaboration and provided initial direction.

Instructional Design

One of the priorities was deciding on a framework for each of the topics in MTH149. We started with the established curriculum, and then thought about how to reconfigure it for the online environment. We wanted to ensure that the online environment was used effectively and that it enhanced the learning process. Key elements of the design included:

- Chunking of content: the curriculum was broken up into modules (referred to as topics). Each module's design was consistent and contained outcomes, an introduction, a pre and post assessment, content, discussion and summary sections.
- Asynchronous and synchronous communication: each module contained an activity requiring participants to apply the new math concepts to a "real life" situation and post their solutions to the discussion board. Tutorial assistance was available through a synchronous chat tool with text chat and a whiteboard.
- Interactive content: multimedia was used extensively throughout the content modules. A "Show Me", "Let me Try It" model was used. Participants were shown animations of key concepts and then asked to "try out" the concepts through interactive tasks.
- Support: as many of the participants were adults who had either been away from formal mathematics training for some time or who had had limited success with mathematics in the past (or both), the

need to provide clear instruction and support in an invitational way was critical.

The experience gained in developing the instructional design model described above (from both a development and delivery perspective) has influenced how current projects are done at Seneca College. The "Show Me", "Let Me Try It" model is used often in the design of elearning courseware at Seneca. The experience of the amount of time needed to develop the multimedia-rich content of MTH149 has led to the design of a three-level scale to determine appropriate resource allocation for elearning projects. Level 1 projects include strong instructional design, but relatively few media elements, up to level 3 projects with numerous media elements. MTH149 was a level 3 design. The three-level scale is used extensively at Seneca to determine timeframes and hence costs associated with elearning project development.

Instructional designers often take on the role of project manager, Mayberry (2004). This can be a benefit because instructional design decisions heavily influence elearning project planning. An instructional designer who understands project management (and vice-versa) is a valuable resource for any elearning project team.

Resources

One of the key aspects of a successful project is its team. The project manager plays a crucial role in pulling the team together, ensuring that each of the team members is in an appropriate role to contribute his or her expertise to the project, and ensuring that the team members have the resources they need to complete the project (Bates, 2000, p. 68). The initial team consisted of two SMEs, an instructional designer (who was also the project manager and SME for parts of the course), a graphic designer, and student production staff.

The success of the team was due in large part to the project manager's decisions regarding who would be involved and in what role While Lockitt (2000, p. 12) recommends that the first task of any project manager is to assemble an effective team (based on his knowledge of people's skills, abilities, and proven track record), this is not always possible. We were fortunate to have team members who were keen on exploring new ideas and committed to developing a pedagogically and technically sound online course.

In order to make the most effective use of our time, we divided the content writing among the SMEs. Each SME took on several of the modules and developed the activities and other materials for those modules. In this way, each of the modules essentially became a subproject, with the project manager managing the development of the materials for that module. This helped keep track of which pieces had been written, storyboarded, developed, and reviewed.

The production work was primarily done by programming or digital arts students hired by the CNTTL. This arrangement benefited both the students (they were able to practice their existing skills, learn new ones, share ideas with their colleagues, and learn valuable team skills) and the Centre (the web-based production was done by the students, who brought many new ideas with them). The challenge in depending on student production work is that, being an educational institution, we have to promote excellence in studies first. This meant that there were times when students had to cancel their shift so they could do assignments or study for exams. It also meant that eventually they graduated and so we had to continually hire and train new student production workers.

The members of this project team wore several hats at different times and the team members changed over time. This fluid team membership has its benefits as well as its challenges. As benefits, it allows team members to explore other roles, and when new team members join, they often bring fresh ideas with them. As challenges, the continuity of the project is threatened when team members leave and new ones have to be brought up to date and become familiar with the project. Further, inevitable style changes creep into the design of the web-based materials as team members change. This has implications in terms of time needed to check and revise media elements to ensure a cohesive look and feel.

Budget

This project was funded primarily through central funding at the college. The CNTTL was provided an annual budget for salaries for its full-time members and money to hire part-time production support. The budget also

allowed for some hardware and software upgrades, to keep up with the newest advances in technology. The sponsoring department funded SME time ($5000).

It is difficult to come up with a total budget for the project because of the experimental nature of the course development. Time was spent trying new ways of creating digital content, some of which we used, some of which we didn't. A modest estimate of the budget would be approximately $50,000.

Technology
The college had made a solid commitment to exploring the possibilities of web-based materials, and so the CNTTL had the technological resources to do that exploration. These resources included the hardware (networks, computer stations, digital cameras, scanners, etc.) and software (Flash for animations, Photoshop and other software for graphics, web-page editors, etc.).

As we were exploring technology for this project, we wanted to make sure that the technology wouldn't get in the way of learning. Everything that we used in terms of technology was readily available to the students who were likely to take the course (current web standards, web friendly software, etc.).

Milestones & Deliverables
Our initial completion schedule was four months (one semester). We divided the course content into 12 modules, and then set up a schedule to complete the development. The first module would be the prototype, and would take the longest to complete. Once the issues in that module had been decided, we anticipated that the remaining modules would "fall into place". The goal was that the interface/navigation and the first module would be completely designed and developed in the first month, the following 6 modules would be written and submitted for development within the second month, and the remaining modules would be written and submitted for development within the fourth month, with full development of the web-based materials completed shortly after that.

We clearly underestimated what would be involved in the process. The scope of the project was large in terms of the number of modules that we were required to develop and the amount of media that we chose to incorporate. Our timeframe grew to multiple semesters, with the full online course being completed over six semesters rather than one (essentially two years on a part-time basis). Our learning from projects like this has made completion dates much more predictable.

Reporting
Most of the progress reporting happened informally between the project manager and the sponsoring department. At certain points, the representative of the sponsoring department would attend a meeting with the SMEs and the instructional designer/project manager. This helped them learn about and understand the complexity of some of the issues involved, and why the development process was taking longer than initially anticipated. This process helped in terms of making the expectations of sponsoring departments more realistic as well. The experience gained from this project has led to a more formalized approach to project reporting.

Beyond the Project
While our responsibility was to develop an online course, we wanted to make sure that students would have all the supports they needed during the delivery of the course to succeed in it. Since we were at an early stage of elearning at the college, policies and procedures were still being worked out to make sure that potential students would find out about the availability of the online version of the course, that they would be successfully registered, and that the course would actually run. As part of the project, we liaised with other departments to make sure everything was in place for the students.

Once the course began, one of the SMEs taught the pilot version of the course. The pilot was offered with very few students, so that each student could get as much individual attention as needed. It helped having someone intimately involved in the development of the materials teaching it the first time to make sure that things would work correctly, and to learn first-hand how students were experiencing the course in the new environment.

We came to believe that an online course is always a work in progress. Every time we took a look at the course, we would find areas that would benefit from another media element to explain a concept better. Once the college implemented a course management system,

the course was reconfigured to run in that environment and make it consistent with other online courses offered by the college. During the cyclical review process for online courses, the course was reviewed, materials were updated, and new topics were added. We also took a look at how the course could be improved to better meet current accessibility and usability standards.

As there has been increasing interest (both internal and external to the college) in the individual "learning objects" within the course, we've had to look at issues regarding intellectual property, copyright, distribution, and licensing. Individual pieces of the course have been incorporated into other courses at the college to help students review specific topics. The college is also exploring sharing the objects from this math course with other learning institutions and making them available through learning object repositories.

Conclusions

The experience gained from the development of the online version of MTH149 has provided valuable insights into elearning project management, particularly as it applies to institutions of higher learning. Over time the project team has had an opportunity to reflect on the process. The following represents some of the learning from that reflection.

The way an elearning project is conceived, managed and implemented has a lot to do with the project team's and sponsoring department's philosophy. The MTH149 project was a mix of a true project management approach and what Bates (2000, p. 59) calls a "Lone Ranger" approach. Although the project was initiated through a formal needs analysis and managed in the traditional sense, the innovations within the project were a result of the creative ideas put forth by a few autonomous individuals (lone rangers). In retrospect, the MTH149 project used the best of what both approaches had to offer. This mixture of styles has become a popular option, particularly for new, innovative projects. However, it has also become evident that "formula" or "template" based projects (those that copy previous innovative, successful projects) are best handled through the project managed approach.

Understanding and operating within institutional culture is of prime importance. Each institution has its own culture. Institutions of higher learning tend to espouse collegiality, individual autonomy, and flexibility. The implications from a project management perspective are many. True project costing can be difficult to determine as many of the resources used by a given project are not budgeted directly (e.g., instructional design time, space allocation), but assumed to be available. Project success is defined differently. A successful project is often considered one that has moved the institution forward (e.g., provided knowledge, processes, skills that have eventually been integrated into normal institutional practice). Whether the project came in on time and on budget can be a secondary consideration. Lockitt (2000, p. 18) points out that "the success of any [education and training] project is usually measured not in profit or production, as it would in business and industry, but by integration of the outcomes into normal curriculum delivery and the follow-up projects it stimulates."

Elearning courses are never done. Although this seems antithetical to good project management practice, it is a reality. The ongoing nature of elearning courses is not a function of "scope creep", but a necessary part of the process. Each course needs to undergo periodic updates to content. Emerging standards (e.g., usability, accessibility) require online materials to be updated to these new standards. Emerging technologies require the updating (and in some cases redevelopment) of media elements. An elearning project manager's role is to realize the course lifecycle (which includes updating) and develop a plan of renewal in which each stage of the process becomes a sub-project. This way some form of project closure at each stage can be achieved.

Elearning project managers need a solid grounding in instructional design and educational technology. Instructional design decisions (e.g., learning theory to emulate; assessment strategy to adopt) and educational technology decisions (e.g., development tools to use; delivery platform/media to use) have a profound impact on the complexity of a project (e.g., time to complete; resources to allocate). Elearning projects can easily get out of control unless the project manager understands the interconnectedness of pedagogy and technology. Institutions of higher learning emphasize (for good reason) academic needs. The elearning project manager must determine what technologies

will fulfill these needs most effectively. This does not necessarily mean that elearning project managers must be experts in instructional design and educational technology, but that they have enough knowledge to critically evaluate the advice they receive from their project teams.

Elearning project managers need to pay attention to a set of concrete practical issues. Planning, scheduling, communicating, budgeting, and archiving are all necessary elements of good project management. Each is critical for project continuity. Such things as knowledge bases and project procedures need to be documented so others who come in and out of a given project remain true to the initial plan. Further, innovation and creativity always bring with them some level of uncertainty. As such, elearning project managers must be willing to take risks, and then manage those risks. For example, the time needed to develop the MTH149 course online well exceeded initial expectations. The team could have scaled back on the media, but both the SMEs and the instructional designer (all having math backgrounds) were passionate about developing a really "good" online math course, and adding effective media elements was important to that vision. Much more time was spent on exploring the possibilities (the technology continued to evolve over the life of the project), much more time was spent on the resulting content writing to reflect what was chosen as a standard media-rich template for the module, and much more time was spent on developing the media elements than was initially anticipated. The project manager determined that the overall time investment was worth the risk and would pay dividends in the long run.

Unintended offshoots of a given project are always a possibility. The initial objective for the MTH149 project was to create an effective online course. This was achieved. However, further developments and trends in elearning caused the MTH149 project to change in ways that were not initially envisioned. For example, learning objects and object repositories came into prominence during the time MTH 149 was being developed. As such, the content was repackaged into learning objects and made available through a learning object repository for use by other areas internal and external to the college. This, in turn, led to an investigation of licensing and copyright arrangements, which, in turn, led to the application of the college's intellectual property policy. Elearning project managers should be aware of current trends and developments that may effect future iterations of a project or may offer a chance to repurpose project outcomes.

Finally, communication is essential. Ensuring that all stakeholders in a given elearning project are regularly informed of progress, milestones, issues, etc. is critical. There should be no surprises. Even if a project runs into difficulty, stakeholders need to be aware of the issues. The project manager needs to provide solutions, communicate consequences and build acceptance.

Elearning project management, as a discipline, is coming into its own; it is a new skill. Much has been learned since the pioneering days of the mid to late 1990s with respect to web-based elearning (and much is left to learn). More and more institutions require the skills of an elearning project manager to bring their educational technology strategic visions to fruition.

Good elearning project managers are leaders and visionaries. Bates (2000, p.75) suggests that "... the best use of technology occurs when the academic not only has a deep understanding of the subject but also has the imagination and a vision of how the subject could be taught differently with new technologies." It is the elearning project manager's role to help academics bring this vision to reality.

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Chapter 7

An Online Food Security Certificate at the local and international levels

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Abstract: This brief report describes key features of the development of the Certificate on Food Security at Ryerson University. Included here is discussion of the main phases of this ongoing development, i.e. feasibility, design, development, and evaluation. Within each there are insights on process and comments about the results. Of note are the links between subject matter experts and initial course formulation, between audience and course design elements, between the multi-level team approach and course completion, and between certificate development and marketing. While the final results on successful completion are not yet in, there are encouraging signs such as the growing registration, the solid consensus within the team, and the continued support for the Certificate within Ryerson University.

Key words: Food Security, Feasibility, Design, Development, Evaluation, Teams, Marketing

Four units of Ryerson University collaborated to create a six-course, post-graduate Certificate in Food Security - the School of Nutrition, the G. Raymond Chang School of Continuing Education, the Centre for Studies in Food Security, and the Office of International Affairs. This initiative, and continued development, is part of Ryerson's distance education programming, an area Ryerson first began to develop in the early 1970s with audio/print courses. While some Internet courses emerged in the mid 1990s, the launching of the Distance Education Unit in 1999 established Internet delivery as the dominant mode for Ryerson distance courses.

Creating the Certificate has been a relatively smooth process because there has been tremendous support within Ryerson for its creation. There have been some challenges because of the complexity of creating a new certificate program, designing a full suite of new courses that didn't previously exist, and constructing the administrative infrastructure to properly support and market the certificate.

Prior to the decision to create a certificate program, few of its now central courses existed in other delivery modes. The Certificate, launched in September of 2003, currently has all the core courses up and running and all but three of the new electives in place, with these last three to be completed by late 2005.

The following case study looks at the development of this Certificate in Food Security, from a project management point-of-view. The purpose is not to detail what was done but to focus on key aspects of the project in order to provide insights into this e-learning project and draw some conclusions. As with all projects there are four discernable phases which are often called initiation, planning, implementation, and closure. For this project the four compartments are titled feasibility, design, development, and evaluation.

Challenges

The following illustrate the significant challenges or concerns facing the development and completion of the Certificate. These issues were:

- Identifying and initiating project elements that give the greatest chance of

successfully producing change agents for food security
- Identifying the most efficient audience (in change agent terms) and figuring out what format and content works best for them - does anyone need and want this?
- Creating courses with depth of content and breadth of activity appropriate to the subject and suited to the adult audience
- Creating a schedule of course development that respects our human resources and cash flow realities
- Creating linkages between courses to reduce duplication and promote flow
- Clearly identifying and developing a project with a diverse multidisciplinary team
- Efficiently using the team concept (developers, instructional liaison, designers)
- Navigating an institutional environment in which this work (food security) is still emerging and peripheral to the main work of the university
- Marketing on a limited budget and with minimal human resources and
- Figuring out if we're having an impact.

Feasibility

The development of the Certificate was led by a group of content experts who had been working together for several years within the Ryerson Centre for Studies in Food Security. The members of the group had been working in food security, domestically and internationally, for 10-25 years each, coming at it from sociology, economics, nutrition, agricultural policy, and community development angles. It was this team that had the job of enunciating the founding principles, assessing the probable audience and laying out a path to success.

The team, wishing to move quickly to create a programme, relied extensively on their experience in the field to assess need, using a mix of formal and informal assessment measures. The Centre believed the problems of food insecurity were so vast and the resources devoted to them so meagre relative to the need, that a major infusion of resources and capacity building is required to build solutions. Because the solutions to food security involve so many sectors and people with so many different backgrounds, there is a significant need to increase food security "literacy" across many fields, institutions and workplaces. This hypothesis was not actively tested but was rooted in the Centre's experience working at the heart of food security teaching, research and activism in Canada and on members' extensive knowledge of the food security literature.

The choice of a continuing education approach with its focus on adult, part-time learners was preferred. Focusing on this market of adult learners working in related fields was an extension of our belief that food security work is so multi disciplinary that the most rapid capacity building would come from augmenting knowledge among people already working on related measures. The collective experience from teaching food security courses and working with community agencies led to a conclusion that many who come to food security start their careers first in somewhat related areas from which they develop their interest in food security work. It is less common to meet people first entering university with this as their focus, in part because it is not typically a component of high school or university curricula. As well, we believed the courses would appeal to mid-career professionals who see food security education as part of their professional development.

Internet courses were favoured because they fit nicely into busy work schedules and food insecurity is a global phenomenon with potential students coming from across the globe. No formal surveys of potential students were conducted, however. Our experience since starting the courses confirms our intuition, in that the adult learners we wanted to target do very well in the courses and find them very useful. Younger students, however, especially those engaged in full time studies at the Bachelor's level, struggle with the format and frequently don't complete their courses.

Audience

The size of the potential audience for such courses was unclear. To our knowledge, no human resource need surveys with a focus on food security had been carried out. However, some estimates of the potential audience were distilled from organizational data bases and listservs:

- World Hunger Year in the USA had a data base of 4500 community organizations working on food security
- Based on information held by the Ryerson Centre for Studies in Food Security and

FoodShare Toronto, at least 500 Canadian community organizations have food security as a significant focus of their work.
- The searchable data base Idealist (www.idealist.org) listed some 26,000 organizations worldwide working on social justice, some of which included food security in their work.

An environmental scan was conducted by performing an Internet search in 2001 on existing course offerings. It and a course compendium constructed by Myhre et al. (2000) revealed that:

- Many universities in North America and Europe were offering one or two courses with a full food security focus. These were typically offered on campus (sometimes through continuing education), usually at an undergraduate level. In Toronto, there were a few food security-related courses at each of Ryerson, the University of Toronto, and York University.
- No undergraduate degrees with food security as their central focus were currently being offered.
- Graduate programs were offered by Tufts University in Boston, Massachusetts and Thames Valley University (TVU) in London, England. Tufts offered a residential MSc or PhD in Food, Agriculture and Environment or Food Policy and Applied Nutrition. TVU offered a MA or graduate diploma in food policy that was also on campus; however, a distance learning program was also under development.
- A post graduate diploma of up to 11 weeks was offered by the International Agriculture Centre of Wageningen University in the Netherlands. This program had a number of similarities to our proposal. It was offered on campus with intensive instruction, and its orientation was primarily related to nutrition.
- Several civil society organizations and para-public agencies offered short courses. These focussed largely on the needs of the developing world, were often 1-2 weeks in length, and focussed on economic modelling and policy analysis. Many international civil society organizations offered field level workshops for their staff on planning, evaluation, design, monitoring and assessment. One example of such a training program is the community food assessment short course offered by the Community Food Security Coalition in the US. This is usually a 1-2 day program that trains community leaders in community food assessment so that they can enhance the design and effectiveness of their community-based programming.

In summary, there were a number of short courses offered for development workers, policy makers and planners within international and national agencies. The training focussed on monitoring, assessment and program planning, and urban agriculture. No one appeared to be offering primarily Internet-based programmes, although some organizations did have training and support materials on the Internet.

Although the assessment and scanning methods were limited, our collective analysis of the audience/participants has proven to be relatively accurate. Students are largely coming from the sectors expected. The absence of programmes elsewhere also made us feel that there must be pent up demand for training in this area.

Schedule

The other major component of the feasibility study was the scheduling of course development along with a projection of costs and revenues for this schedule. Based on the experience of other certificate programs, and to try and ensure a minimum 12-student enrolment per course, the general approach is to offer core courses every second semester in an overlapping pattern, with electives offered once a year. The exception is the Concepts and Principles course, a prerequisite for other courses, which is offered every semester, either as a day course (available to full-time Ryerson Nutrition students) or by Internet. The spring session is a particularly important semester for this course as many students want to take it to complete a degree and potentially launch subsequent studies in the certificate programme. Optimizing this sequence is important from a financial point of view. If attendance in Internet courses consistently falls below twelve students, courses end up running a financial deficit.

The attendance for the initial courses has been low but this is not unusual for a start-up certificate in the process of refining its target

marketing. In addition, the amount of word-of-mouth advertising can not be under-estimated. Attendance in the foundation course, CFNY403 Food Security Concepts and Principles shows encouraging signs. It had 14 registrants in fall 2003 but 28 in fall 2004 (and an additional 25 in the classroom version). CFNY404 Food Policy and Programs for Food Security had a similar trend with eight registrants in spring 2004 and 24 registrants in winter 2005.

The Internet format has perhaps narrower appeal than we anticipated as many students indicate they would prefer class courses if they had an option (in our situation, only full-time students in Nutrition can take classroom courses). More formal surveying of potential students early on might have revealed that. Our capacity to rapidly build enrolment by targeting the most interested audiences might have been greater with more of this type of information. It may be that this field attracts people who value interpersonal communications, hence their preference for a classroom. Certainly, the discussion areas are often filled with messaging that in some ways mimics the kind of chatting that might go on before and after class. We conclude that at least some students in Internet courses are there because they don't have another option.

Objectives

A set of project objectives were developed from the challenges noted above and the initial assessment work. These objectives were;

- Create a self-sustaining, six course post-graduate certificate in food security in the next three years to be delivered via the Internet
- Establish a modular approach to the courses to minimize duplication and promote the reusability of modules for Centre course and workshop activities
- Utilize a team approach in the development and maintenance of the courses
- Increase the number of change agents to work on food security issues, both domestically and internationally.

Design

The design stage flows out of the feasibility study, the general findings of the environmental scan, and the specific needs reflected and stated by the many stakeholders. The purpose in each of the following four topics is not only to illustrate the approach taken in this certificate but also to critique what was done and to comment upon what might have been done. In this way, the value of the work may be assessed and so prove of benefit to others. The topics are learning objectives, team approach, matrix overview, and course design.

Learning objectives

The initial proposal for the Food Security Certificate outlines several overall learning objectives couched in terms of what the graduates would be able to do. These objectives are;

- clearly articulate food security, and its relationship to food system, food policy, and health promotion concepts;
- assess and monitor individuals, households, communities or nations for food security;
- identify the forces contributing to food security and insecurity at an individual, household, community or national level;
- identify best practices for food security from within Canada and other nations;
- design effective and integrated programs, services or policies at the individual, household, community or national level to contribute to food security; and
- evaluate food security program or policy effectiveness. (CSFS 2002, 9)

Within each of the courses there are a series of more specific content objectives but not learning objectives following a structured or fixed template approach. Examples of these types of module goals are;

- This module reviews the global state of food insecurity and highlights some of the limitations on our ability to determine how many people are actually affected by food insecurity.
- In this module we outline how food insecurity, in its multiple forms, has a negative impact on health.
- This is an exploratory module where you, through your own investigation and discussion, identify some of the major issues that need to be taken into consideration in community development and food security.

This approach towards specifying objectives for the certificate and course modules has its pros and cons. On the one hand, the courses are expert-driven where the content is considered an essential foundation for discussion and practice. The last goal noted

above illustrates this concern with practice and process. Such a sage-on-the-stage approach is not uncommon especially in a subject area with so few fore runners. It also recognizes the demographics of the probable participants, e.g., adult learners from diverse regional and cultural backgrounds and who are seeking an authoritative voice providing relevant content in an interactive learning environment. Notwithstanding this expert-driven approach, there is an understanding of adult learners and their many traits. The traits such as those mentioned by Lieb (2005) are integral to course development. Examples of adult learner traits essential here and integrated into the courses are;

- needing to feel self-directed accomplished through choice of assignment topics,
- being able to connect their life experiences with the course content fostered through discussions relating concepts to their personal examples,
- maintaining respect for others by valuing local situations and examples in main discussions and chat groups, and
- being goal-oriented, relevancy-oriented, and practical in approach through clarification of module goals, provision of actual scenarios and focus on action research assignments.

On the other hand, refraining from well structured and easily measured learning objectives makes clear evaluation of the outcomes more fragile. Providing learning objectives with the three key elements of performance, condition, and criterion would assist in evaluation not only of the certificate approaches but of the participants' learning outcomes and impacts. Saks and Haccoun (2004) describe the three elements as what behaviours or actions the learner should display or take (performance), the tools with which, timing in which and/or situations under which the learner might act (conditions), and the standard or acceptable performance by which he or she is measured (criterion). Taking this approach would also reinforce the link with adult learner traits noted in the last paragraph and the project objective of creating change agents noted earlier.

While not explicitly expressed by the group, it is evident from the enthusiastic and passionate discussions at instructor meetings that the certificate is one means to develop change agents and to have an impact on the state of food security. Developing measurable learning objectives might be one way of aiding assessment of this impact. Such explicit statements would not only prompt more measurable objectives but also entail inclusion of how to be a change agent, how to connect to the NGOs and institutional players that needed to be changed, how to become skilled at programme design, and how to understand intimately the policy process. All of these are worthwhile actions for the future.

Matrix overview

From the comments above it may seem that everything runs smoothly all the time. The diversity of the team requires a great deal of communication and clarification. The Centre and the coordination in the certificate provide direction and bounds. At this point there is no forced ensurance of consistent treatment of the complex food security questions across all courses. Reliance is placed on each instructor to reflect their divergent opinions within the context of the goals of the Centre and the certificate. To bring coherence and interconnectedness in the material across certificate courses, the team has a matrix of the modules of certificate courses to try to assure that material from one properly leads into another, more advanced, course. This overall certificate course planning reduces overlap and also provides the ability, when finally realized, to mix and match modules for workshops, presentations, and new course offerings.

Team approach

Of significant import to the initiation and development of this certificate continues to be the vital team approach of the people involved. The team involved in the certificate are cross-functional, heterogeneous, dynamic, and task-oriented.

The initiating core comes from the Centre for Studies in Food Security which draws members from several departments at Ryerson as well as from related off-campus groups. (The CSFS web site is available at http://www.ryerson.ca/foodsecurity) While those involved have a diversity of teaching and research interests (sociology, economics, ecology, policy, nutrition), of administrative and management abilities, and of technical skills, they have a similar vision of what is to be achieved. Understandably, some intellectual disputes within the team occur, particularly around the role of biotechnology,

and finding the proper mix of market failure and non-market measures to solve food insecurity. However, instead of producing a stream of turbulence, the team members seem to favour 'constructive conflict' as a matter of course.

Examining the team sheds light on the reasons for its cohesion and success. Especially relevant here are the elements of organizational leadership, team process, and satisfaction of member needs. The School of Nutrition, the Faculty of Arts, and Continuing Education provide the administrative leadership and process support for the Centre for Studies in Food Security to flourish and the certificate to succeed. In addition the Centre co-leadership comes from the School of Nutrition and the Department of Sociology. The team processes of forming, storming, norming, and performing can play out within this leadership framework without fear of the removal of support and team collapse. In addition, the multiple roles that the team members play in more than one of the above organizational units facilitate communication, coordination of activities, and overall organizational support. The fulfillment of the members' needs for affiliation and achievement can not be overemphasized as a large part of the motivation for developing the certificate.

The course development structure is another significant illustration of the team approach at work. Subject matter experts do not work alone in developing courses for the certificate. The Centre provides the guiding force but a team of subject matter expert (usually the future instructor), a learning materials designer (instructional designer), and learning materials developer (software expert) work together to produce learning materials for Blackboard, the learning management system at Ryerson and Ektron, the course content manager. This team works together from signing contract to running of the online course. In this manner, the members build a relationship that aids in the transformation of materials into a viable course.

The most significant problem of this team diversity is obtaining time from team members to move the various certificate elements forward. Multiple obligations and matters have resulted in course development schedule shuffling. We have managed to confine this to some electives which fortunately have not unduly compromised student efforts to advance completion of the full certificate. The breadth of Ryerson units involved can also pose challenges as administrative leadership changes and priorities shift, but to date, support for the programme remains solid.

Course design

The course development team takes the course from idea to completion. While the subject content and approach is the purview of the developer/instructor, there is much discussion about the look and feel of the content and the interaction within the course environment. Once again there is a clear recognition that the adult learner participating in the course has particular learning styles or habits. The course layout and activities must address the andragogic traits such as the self-direction, goal-orientation, relevancy orientation, and practicality outlined by Knowles (1990) or those such as concrete experience, reflective observations and active experimentation noted by Kolb (1984). All of these traits are not held by every participant, as a result the courses must address, as best as possible, the full range of preferences in learning styles.

The courses utilize a variety of content formats and activities in order to address the varied learning styles of the participants. The textual content is complemented and extended through the use of links to online resources (library reserve materials, digital databases), graphics (static and dynamic in nature), and the insertion of interactive elements. The emphasis is on interactivity among the participants and between the participants and the content with the use of automated assessment tools (reflection tasks, self-assessments, quizzes), collaboration tools (group discussion areas), communication tools (internal messaging, chat facilities, threaded discussions), and survey/feedback opportunities which are summative in nature. All these are arranged within the weekly modular framework so that there are a variety of learning activities available. The enthusiasm of the students for this variety is shown in the following specific comments. These comments are:

- *The content was great and it's great to actually interact with other students*
- *Content! I found it fascinating. So much to read especially the "extras" which are always so tempting.*

- *It also allows for such a broad input of perspectives because people can register world-wide.*
- *Overall I think the on-line program is excellent, it offers a great opportunity for working professionals to work at their own pace and around other commitments.*

Given our desire to create change agents, a significant challenge of internet delivery is connecting course content to the organizational and institutional environments in which food security work occurs. In classroom courses, this might be accommodated with field trips, films and guest speakers. In our context, we try to assign major papers that require students to interact with community organizations in the place they live. This has so far received very positive feedback from students who discover new organizations and processes at work in their communities. Unfortunately, it can be a burden for community organizations, especially in areas where one organization is dominant or where only a few are active, and this requires some long term attention so that students are not cut off from community expertise.

Development

The Design section above provides an introduction of a few aspects which underpin the development process. In the actual development process it is valuable however, to touch upon three significant issues. These topics are the scheduling of course development and delivery, the international scope of the audience, and the linkage between development and marketing processes.

Scheduling

Developing a course in the Ryerson system calls for all material to be in place before the course begins. There is an eight month time line, four months to develop the content, and four months to develop the technical elements to make it appropriate for Internet delivery. At least this is the initial contract position. Invariably there are extenuating circumstances that often come into play to produce tighter timelines from contract through development to first running of a course. The reason for flexing production cycles come about through the vagaries of the educational environment. There is a leniency towards hitting milestones on time and so the subject matter experts, outside consultants or Ryerson faculty, can ask for and often take more time as a result of their more lucrative ventures or of significant shifts in their teaching responsibilities. Ryerson tends to accommodate theses situations and in most cases they do not result in long delays. No course has been cancelled as a result, but some have been delayed.

A related challenge, more to do with the revision cycle than the development process, is that continuing education courses are sponsored in part by academic departments. For the certificate, most courses are sponsored by the School of Nutrition. The school must offer some of these courses to day program students from time to time, so constructing classroom equivalents to Internet courses have required some effort. We must monitor changes in these courses over time because the different instructors use different teaching approaches. The reason for this scrutiny is that we want to ensure some basic equivalency in the course content and demands. This issue needs watching, especially as we move from the first wave of instructors who have all been course developers, to the second wave who will not have been connected to the development process.

International scope of the audience

The disparities between local, national, and international students are important to course development. On the technical front, the courses are relatively simple in that, to date, neither streaming video nor required-chat groups are used. In addition, the graphic elements or download files are kept to a minimum size. Too complex an offering with live chats and difficult graphics can create undue frustration and even loss of content especially with slow or intermittent Internet connections. The need to provide both domestic and international content makes it challenging to keep course modules to suitable lengths. The solution to date is to give students options within modules about which streams they wish to follow. So, someone can pursue readings on different themes from different parts of the world to reflect their local and specific interests.

Marketing

Marketing is tied less specifically to individual course development and more to certificate success. Marketing resources are relatively limited and so, understandably, a smaller programme like the Food Security Certificate

receives less attention. As well, internet delivery suggests electronic marketing is a priority, so developing electronic marketing materials is the focus. The web site, noted above, continues to be at the centre of the marketing. In addition, there is extensive reliance on listservs to announce course offerings. This latter route is relatively successful at reaching the NGO market. This electronic focus serves to reduce marketing cost of staff time and of the use of the existing electronic infrastructure but is this focus with its reduced costs the most appropriate strategy? An initial indication is that since launching the new program web site in June, there have been significantly more unsolicited inquiries from prospective students.

To complement the electronic phase and compare the results, the next marketing phase involves using existing Ryerson communication vehicles (e.g., the Alumni magazine) to better reach Ryerson alumni in degree programs related to food security (e.g., nutrition, urban planning, retail studies, political science, public health). In addition, this broader phase includes communicating directly with professors in schools of agriculture and nutrition at other universities in North America and exploring opportunities to include the certificate programme in the approved professional development listings of professional groups such as public health practitioners.

Evaluation

The Kirkpatrick schema of evaluation provides one method of assessment. Notwithstanding the criticisms of the Kirkpatrick schema, it points out several deficiencies and possible remedial actions.

The level 1 assessment of reactions to the course is a common occurrence. The Food Security Certificate online courses have online surveys at the end the semester. These surveys provide a feedback mechanism for the students and one way to elicit their reaction to the course. Among those who complete the courses, feedback is very positive. Students really like the conceptual approach and the fullness of the food security concepts used, the focus on the food system as a source of food insecurity and as a solution to problems, and the solutions oriented approach or the concern with how to improve the situation.

The second level of assessment, learning or the knowledge acquired, skills improved, or attitudes changed as a result of participation, is another standard approach. In these courses the assignments and final exams or projects are the activities of import here.

The last two levels, behaviour or the measures the transfer of training and results or the measure of the impact of training on the organization, are not currently examined in any formal way. At this point, no students have completed the full certificate. As a consequence, it is difficult to know at this stage what impact the courses are having on students' career choices, work activities, and organizational realities. A quote from a student does provides some indication of what might result:

> "I registered for the Certificate in Food Security because I wanted to formalize (and gain accreditation for) the knowledge I'd already gained through work experience and self-directed learning. As a food security consultant, I use the education I am receiving in my work with one of Toronto's Business Improvement Areas. I also draw on what I learn in my fund-raising and policy advocacy activities with youth shelters in the GTA."

However, not having some mechanism to assess levels three and four points is a significant gap in the current approach that needs attention to know whether change agents are being created. The Certificate team does not currently have the capacity to evaluate in the workplace whether the certificate programme will have impacts on student employment options and their effectiveness at delivering food security programming and policy. This suggests a key area for further development and assessment, i.e., retaining communication with students. One possible solution is to create a password protected web site on which alumni could continue to discuss food security issues as they have in the courses. Such a web site could become a forum for exchange of ideas related to former students' current work. It also becomes a vehicle for surveying alumni on current employment and outcomes of their work and provides a possible route to evaluating at levels three and four.

Conclusion

The members of the Centre for Studies in Food Security recognized a need for broader knowledge of and participation in their area of concern. The challenges, noted above, set the tone for their move into online Certificate delivery as one route to satisfying this outreach. The sections on feasibility, design, development, and evaluation provide insights into the process and comments on key issues. Of the many insights and comments four merit consideration here.

Conversion takes time

The feasibility study suggested gaps in food security coverage as well as a demand for information on the subject. The subject matter experts could put the materials together into courses but not also work at reaching the possible participants. Word-of-mouth is an excellent route to exposing the Certificate but insufficient in the long term because such strategy takes time. With the broader approach to marketing, the registrations, one would hope, would increase more rapidly. In hindsight, with concurrent development and marketing processes, the registrations might have risen at a steeper, steadier rate.

Importance of a team approach and consensus building

The multi-level team approach seems to work very well for certificate development. While this group has a variety of backgrounds, the members hold complementary if not similar visions of the Certificate. This is not to say that there is groupthink here. There is vibrant discussion and consensus building without a blinkered approach or brow beating. This means that new comers to the team can easily bring in their new ideas which are integrated into the approach or used to modify the overall vision. It also means that the different skills and abilities of the team members are valued and are seen as contributory.

A matrix view is straightforward but difficult

The members recognize a modular matrix approach as worthwhile. At the present time there is an expectation that new course developers take the prior work into consideration. There is no formal method by which the new course modules are scrutinized to see whether they overlap. As new courses are added and old ones revised there needs to be some process in place to assure integration without undue overlap.

Evaluation as simple as it is insufficient

There is a reliance on the tried and true evaluation mechanisms of tests and course end surveys. While Kirkpatrick's levels might be too rigid or too narrowly focussed, they provide a starting place for the expansion of evaluation mechanisms in the courses and for the Certificate as a whole. If one of the objectives of this project is to develop change agents, the elements of level three and level four evaluation according to Kirkpatrick need exploration.

The next steps in this project focus on re-examining the current objectives and assessing the current success in achieving them; on the assessment of the courses in light of level one and two evaluation information, and on the discussion of whether the team should close this development project and begin a new project on revision and expansion of the Certificate.

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Chapter 8

Learning to Go the Distance: planning professional development in an e-learning context

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Abstract: The project described was initiated in the late nineties and reflects the development of a team that was focused on effective learning and teaching in the online environment. Of particular interest is the way in which the distance education team came together to capitalize on the strengths of individual expertise in such a way that the team as a whole exceeded the potential of the individual members. The process of online program development is described, as are the challenges that occurred along the way.

Key words: Learning communities, e-learning, reflective practice, team approach

Teachers have begun to demand high quality online education programs in order to maintain professional competencies. For those in remote and rural areas and for many women teachers the dual responsibility for family and classroom means that accessibility to professional development can be limited by both time and distance constraints. E-learning programs obviate the problem and make professional development accessible.

Yet teachers also seek professional learning communities (Hargreaves, 2001; Fullan & Hargreaves, 1992) in which there are opportunities to discuss practical problems and apply theory to practice. In Schon's (1987) terms, in a learning community reflective practice develops and allows practitioners to re-frame the issues in such a way that they are liberated from the predominant emphasis on knowledge of "how-to." A key challenge for anyone planning a program of professional learning for teachers is how to shift from an emphasis on technical knowledge to an examination of authentic practice issues and to foster discussion in a forum that is safe, yet sophisticated enough to provoke questions and disrupt 'the taken-for-granted' in order to move the practitioner from routinization to professional practice. The problem in most professional development contexts is that there is rarely the time, the forum or the language to engage conversations about practice.

So how might one design and deliver professional education to meet the goals of reflective practice when popular forms of distance education "are designed to support

only knowledge acquisition [resulting in]... student outcomes [that are] restricted to reproductive learning"? (Jonassen, 2002, p. 76). Often, these courses amount to little more than the transmission of technical knowledge. Reducing the complexities of teaching to technical knowledge limits professional development and indeed may further exacerbate the theory to practice gap.

The challenge becomes one of facilitating a discourse that re-frames professional issues in an accessible manner; one that respects the life experiences of teachers and the theories on which their practices are established, in a context in which the teachers become knowledge producers pursuing their own intellectual development (Kincheloe, 2004). At the same time, it is necessary to create a scholarship of online teaching and learning so that others may learn from the experiences of early adopters and innovators (Duffey and Kirkley, 2004). In other words, how does one build a virtual community of practice? The following paper briefly describes an innovative project that broke new ground in terms of developing online professional learning for teachers.

The beginnings

After some discussion about reflective practice and ways to establish an online support group (Rich, 1995), the distance education team experimented with course delivery using the Internet and a commercial online conferencing tool. The team consisted of a core of ten full-time staff and faculty with overlapping expertise in teaching and pedagogy, editing, systems administration and security, web administration, database development, web content design and preparation, web based conferencing support and project management. Many significant technical and pedagogical issues were addressed as team members frequently broke new ground in terms of their own expertise and knowledge. Team members worked collaboratively with each other, as well as with the instructors teaching the on-line courses in addressing problems as they arose. Instructors were encouraged to offer suggestions to make online teaching more effective and team members considered all requests from both pedagogical and technical perspectives

Tensions between theory and practice emerged as the first three on-line courses evolved. Discussions revolved around both the content, its organization and quantity, and the design of the interface. As questions arose, the instructors and team members were confronted with their beliefs about the teaching/learning process. A design that included uploading lecture notes and quizzes to a web site would be pedagogically weak, leaving both students and instructors dissatisfied. Instead, it became essential to think about ways to design so that a social constructivist view of learning would be reflected. How might questions be embedded within content to foster reflection? How many and what type of questions were needed?

Over time, it became apparent that managing and facilitating the online discussion complemented initial questions about design. What conference questions would help develop reflection? How might students be encouraged to work with each other? How could reflective practice be promoted and enhanced at a distance? Would an asynchronous conference tool work? What was the place for real time chat? The questions spawned a working framework in the shape of a triangle; one that respected the balance and integration of three important components: Pedagogy, Technology and Dialogic Interaction.

Instructors noted that when an informal talk area was established, learning concepts related to practice was facilitated. In other words, personal support provided the security to discuss and respond to challenges related to complex issues of practice. From this observation a research project to examine the nature of online interaction emerged. The research indicated that effective online conversation was an amalgam of talk and writing and highlighted the role of instructor modeling in course success. Other aspects of effective interaction were identified and provided an emerging methodology for online instructors (Rich & Woolfe, 2001).

Design and methodology

The primary goal was to provide a seamless, positive learning experience for teachers with reflective practice as central. Reflective

practice legitimized practice but also provided teacher candidates permission to highlight critically important practical issues. In courses, learning moved from whole class (instructor to student through the web site) to small group (interaction facilitated online) to individual, self-directed learning (reflective practice project and professional portfolio). Throughout the process, the instructor had to facilitate interaction through modeling, probing, synthesizing discussion, challenging ideas, and offering immediacy statements as needed. Course design fostered:

- Rigorous curriculum content standards
- Ability of students and instructors to co-construct meaning through interaction
- An understanding of practical experience through a reflective practice project
- Critical professional dialogue as basis for professional reflective practice

Specifically the following items were determined to be essential in fostering effective online professional development:

- Courses had to be designed in modules, each with a specific start and end date so that students can focus on specific dimensions of content. Each module was supported through related web-based readings with relevant questions embedded in module content.
- Each module has a focused conference discussion area in which students respond to other student's comments as well as the instructor's questions in ways that confirm, challenge or further the discussion.
- Students are required to attend virtual class at least every three days per twelve-week term.
- Online interaction is monitored and guided. Informal discussion is encouraged to clarify and personalize learning as well as building relationships that foster community.
- Every course has a reflective practice component in which the student seeks out a local mentor. Mentors are acknowledged formally for their contribution to professional development.
- Students maintain a professional portfolio that is emailed to the instructor for evaluation.

The design that evolved in the project described reflects a suggestion of "a concern with what the technology enables, rather than the technology itself." Oblinger & Oblinger (2005, 2.10). Further, clarity of expectations, procedures and timelines is often cited as one of the basic requirements of a successful online experience (Garrett & Francis, 2004; Long, 2004; Wiley & Schooler, 2001). The design that evolved in this professional development project reflected a marriage between technology, pedagogy and dialogic interaction. The same clarity of procedures and time expectations present in the face-to-face environment enhanced learning as the technology became little more than a transparent vehicle through which course participants could interact and learn through and with each other.

Conclusions

The project described above reflected the effectiveness of a team approach in facilitating learning. In this project, team members respected the contributions of each other-that respect for difference in expertise was reflected in the course design. Through a discussion of reflective practice and the development of a face-to-face community, the team members understood what it was to be reflective, to collaborate and to be members of a learning community. Their personal experiences as part of an effective team were reflected in the program design. The overall integrity and consistency of courses has been improved by pedagogic conditions that supported the development of an online community.

The team approach has provided effective professional development for teachers in remote and rural areas. This professional development is not simply the delivery of technical rational knowledge but rather, the facilitation of a learning environment which facilitated the formation of a knowledge community in which members systematically engaged in reflective practice. Online learning communities do work but have to be carefully facilitated by instructors committed to reflective practice.

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Chapter 9

Managing Large-Scale Customised eLearning Content Development

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Abstract: How does one manage an eLearning project involving the creation of more than 400 hours of customised eLearning content, to be completed within a three-year period and involving more than 200 personnel? Our project management team did it by first starting off with a strong project management framework, and then modifying or adding on to that framework when certain issues were identified.

This large-scale customised eLearning content development project started in 1999 and was successfully completed in 2002, but not without its fair share of highs and lows. In this chapter, we discuss the original project management framework used, the modifications that were made to the framework, our lessons learned, and what we think are key takeaways. Any organisation intending to embark on a customised eLearning content development project, especially on a large-scale basis, should find this chapter presents a useful reference model.

Key words: Military training, large scale projects, customized elearning, content development process

In 1999, the Defence Science & Technology Agency (DSTA), under commission from the Singapore Armed Forces (SAF), awarded a multi-million dollar contract to a local IT vendor for the design, development and delivery of about four hundred (400) hours of customised eLearning packages for various training schools and institutions (hereafter collectively referred to as schools) in the SAF. The timeline given to design, develop and deliver the courseware was three (3) years.

A key reason for embarking on such a large scale eLearning project was that manpower resource is scarce in Singapore, and previous studies (this project is the 3rd of such customised eLearning content development for the SAF) has proven that eLearning programmes, when properly identified, designed, and deployed, improves our soldiers' ability to plan and fight. Hence, eLearning is used as a key supplementary instructional medium, providing training to soldiers on procedures and drills that are highly repetitive.

For this project, customised eLearning content was developed for 38 training schools in the SAF, constituting about 400 hours of eLearning courseware. More than 200 personnel were involved in this endeavour, albeit not all were involved for the entire three-year duration. For example, some SAF schools were only involved for, say, one year, and involvement for them ceased after the successful deployment of the eLearning packages in their schools. This project is part of the larger SPOT-ON (**S**elf-**P**ace, **O**n-**T**ime, **O**n-**N**eed) Programme in the SAF, a programme aimed at harnessing the

affordance offered by Information Technology's (IT) 24x7 nature that allows trainees to learn at their own time and pace, as and when needed.

For this chapter, we refer to the *entire* content development project as a *programme*, while *individual* customised eLearning content development efforts in *each* of the SAF training schools as *projects*.

As can be expected from a multi-million dollar endeavour, this programme involved numerous parties, playing different roles, at different stages of the programme. These roles are broadly summarized in Figure 1 below:

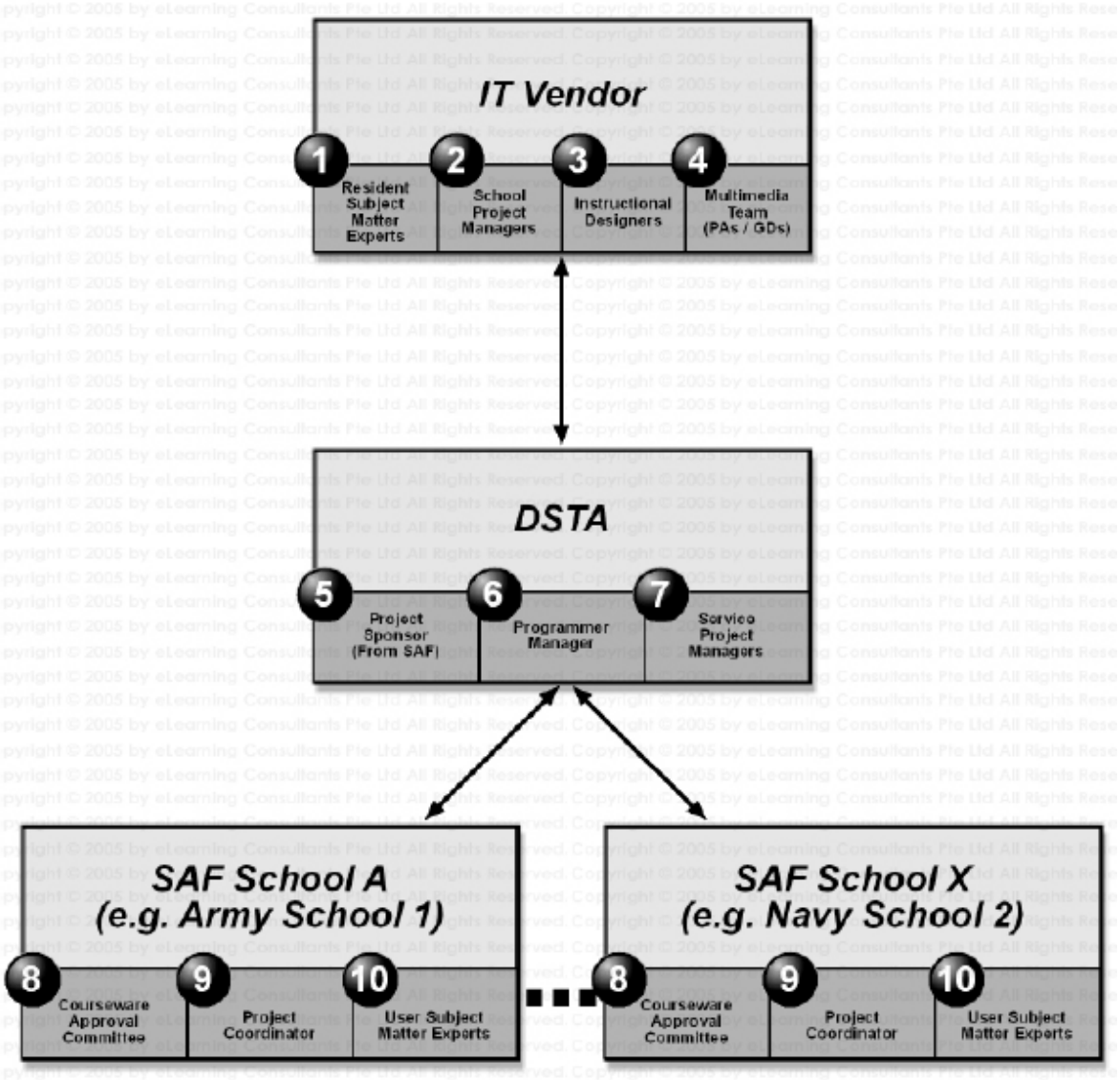

Figure 1: Programme Overview

Role Descriptions:

1 *Resident Subject Matter Experts (RSMEs)* – RSMEs were the subject matter expert employed by the IT vendor, and based in the IT vendor's premises, to provide guidance to the Instructional Designers on the accuracy of the lesson content based for their expert domain.

2 *School Project Managers (SPJMs)* – SPJMs were responsible for the implementation of the Project Management Plan and co-ordination for the delivery schedule. A School Project Manager assigned Instructional Designers, Programmers and Graphic Designers to the lessons specified for content development.

3 *Instructional Designers (IDs)* – The IDs were responsible for working with the relevant SMEs to assimilate the lesson content, and designed courseware based on instructional strategies. The IDs then worked with the Multimedia Team to produce the final courseware.

4 *Multimedia Team*

• *Programmers (PAs)* – PAs were responsible for translating the design of the Instructional Designers into a courseware using the specified authoring tool. They integrated graphics, animation, video, narration and other multimedia elements into an interactive courseware.

• *Graphic Designers (GDs)* – GDs were responsible for the presentation of the courseware. They produced animation and graphics based on the Instructional Designers' requirements.

5 *Project Sponsor (PS)* – PS set the high-level goals, intended outcomes and dictated the execution strategy for the whole programme.

6 *Programme Manager (PM)* – The PM was responsible for managing the whole programme, and ensured that the high-level goals and the intended outcomes were achieved.

7 *Service Project Managers (PJMs)* – PJMs were responsible for the entire courseware developmental work within the 3 services (Army, Airforce and Navy).

8 *Courseware Approval Committee (CAC)* - CAC Chairman (usually the school's Commanding Officer or Chief Instructor) oversaw all content development efforts for his/her school. The CAC reviewed and approved the project plan, progress reports and phase-end products. The CAC Chairman also provided direction to the USMEs during content development in line with the project schedule.

9 *Project Co-ordinator (PC)* – Project Co-ordinator were responsible for coordinating the assignment of the USMEs to each lesson, and assisted the CAC in monitoring the progress of the project schedule within their respective schools.

10 *User Subject Matter Expert (USMEs)* - USMEs were the main subject matter expert based at the school, providing guidance to the Instructional Designer on the accuracy and adequacy of the lesson content.

At this stage, it might be interesting to mention that, on the onset, the SAF's Joint Operations & Planning Directorate (JOPD, which was the project sponsor), together with DSTA (in this programme, DSTA played the role of the technology arm of the SAF), set the high-level goals (e.g. put content outside the traditional classroom and training shed), intended outcomes (e.g. convert repetitive training curriculum into self-study "e" formats), and execution strategy (e.g. working with one key vendor, but yet at the same time working with a few other smaller vendors) for the programme, along with the budgetary and timeline constraints.

While this detail may be deemed to be an operational issue – one not directly related to the actual eLearning Project Management (ePM) – in retrospect, we think that from an ePM perspective, it is important to have a sponsor who not only supports the project, but have a hand in defining the:

- Goals and (measurable) intended outcomes of the programme/project
- Budgetary and timeline constraints
- Execution strategy on how to achieve those goals and intended outcomes

After all, as suggested by Shackelford (2002), eLearning Project Management often fail because it does not get the (ongoing) support from management (sponsors are included in this category). We would like to add that support from management should include clearly defining the goals and (measurable) intended outcomes, along with the budgetary and timeline constraints, and execution strategy. Our experience managing other eLearning projects reveal to us that projects that have sponsors who do not have an active involvement in this first step, often end up failing for reasons such as scope-creep, unmanaged expectations, cost overruns, weak demonstration of ROI, and the like.

Description of Project

Clearly, for such a large project, a comprehensive and unambiguous (to the extent possible) project management framework was needed to be put in place. This project management framework needed to fulfil the objectives of:

- Ensuring that the SAF training needs were met by the courseware produced
- Ensuring that the time taken to produce the courseware was within reasonable limits
- Ensuring that the non-monetary resources spent by the SAF (e.g. the school's subject matter experts' time) while helping to design/develop the courseware were kept within reasonable limits
- Ensuring clear division of labour between all parties involved
- Keeping scope-creep in check

The project management framework we used consisted of two components, namely, the:

1. *Content Development Framework*: The content development framework mainly dictated how the development of customised eLearning content for each school was to be done;

2. *Change Management Framework*: The change management framework mainly dictated how change requests should be handled and resolved.

The content development framework is depicted in Figure 2 below:

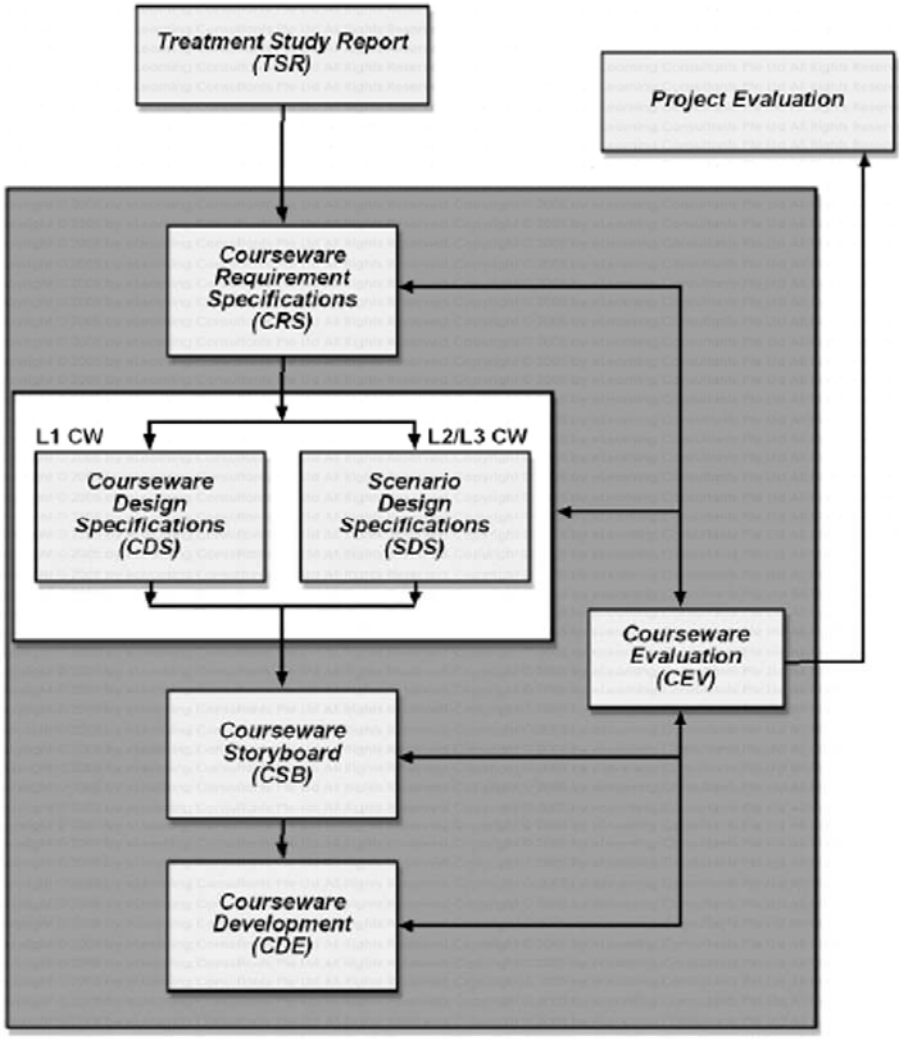

Figure 2: Content Development Framework (Overall Flow)

Let us look at each of these frameworks in turn, starting with the content development framework. Do note, however, that this chapter does not go into the intimate details of the entire process methodology that we use (it would take an entire book to do so), but rather, summarizes our case study and provides a functional overview of the entire project management experience, focusing on relevant project management aspects of our process methodology.

Content Development Framework

As shown in Figure 2, our content development framework started off with a Treatment Study which produced the phase-end product of a *Project Management Plan* (PMP). At the start, Instructional Designers (IDs; supplied by the IT vendor) and Subject Matter Experts (SMEs; supplied by both the SAF school and the IT vendor) worked together to recommend an effective learning system through a process of analysis, carried out during the *Front-end Analysis* stage.

Based on the results of the analysis, IDs put forth a *Proposed Treatment Plan*, which was reviewed by DSTA's PJM and the CAC Chairman. At this stage, DSTA looked at the budgetary constraints and advised the CAC on technical issues, while the CAC focused on whether the proposed plan met the school's training needs adequately.

Upon approval by DSTA's PJM and the CAC, a *Project Management Plan* was produced by the School Project Manager (SPJM; supplied by the IT vendor), and this PMP was jointly endorsed by DSTA's PJM (who ensured the timeline stated was reasonable and the division of labour proposed was appropriate), CAC (who was made aware of what the project required of the school's USME(s) and any other commitments required from the school, such as video shoots) and the IT vendor (who ensured adequate manpower and resources were put in place to complete the project on time).

Looking a little deeper into the Treatment Study process, during *Front-end Analysis*, IDs worked with USMEs and if available, RSMEs to analysis the school's *training needs* in accordance with the *performance requirements* of a particular vocation (termed *performance analysis*). Upon identification of the performance required, the current course curriculum (usually consisting of strictly face-to-face lessons and/or workshops) was reviewed to identify broad portions of the curriculum that would be suitable for eLearning (termed *course curriculum analysis*). After that, primary and secondary trainees for the course were identified and prerequisites were drawn up. The current teaching content, instructional methods and training effectiveness evaluation methods were also consolidated as they aid meaningful comparisons later on.

A report is written during the *Proposed Treatment* phase, which mainly lists the:

- Principal considerations as to whether to convert a lesson into eLearning format or not
- Learning approach to be taken, how and how much to blend approaches
- Broad macro-instructional strategies for the eLearning lessons identified (e.g. provision of a control console emulator so as to aid "fail-safe" learning)
- Learning environment of the converted eLearning lessons (e.g. whether it's 100% self-paced and self-based, or whether it's instructor-supported)
- The new course/subject format, given the eLearning lessons

Finally, upon endorsement by the school's CAC, a *Project Management Plan* (PMP) was drawn up by the School Project Manager (SPJM). One PMP was created for each school, and this PMP dictated the:

- *Project Organisation Chart*, which dictated the roles and responsibilities of all parties involved in the project
- *Project Schedule*, which detailed the milestones and timelines
- *Project Resources*, which detailed the resources needed (e.g. video shooting of combat engineers laying out a bridge)
- *Warranty*, which stipulated the terms and conditions of the defect rectification
- *Maintenance*, which stipulated the maintenance plan of the courseware built
- *Security*, which stated how security issues would be handled (e.g. the sign-in and sign-out of classified materials)
- *QA Plan*, which stated how the courseware built will be checked for correctness

While the Treatment Study recommended broad courses to be converted into eLearning format, it was the Courseware Requirement Specifications (CRS) that captured the exact titles, along with the chapters and topics therein, as well as required "run-time" of each courseware that was to be converted into eLearning modules. The overarching objective of the CRS was to establish the instructional goal, trainee requirements, scope of work, as well as to recommend learning objectives, interactivity levels and macro instructional strategies.

The CRS itself was actually a pre-defined form that was to be completed by an ID for each courseware. The CRS consisted of two portions, which required IDs to take into consideration the:

- Analysis of Courseware/Title
  - Contents currently available
  - Trainee's initial state (e.g. educational levels, prior courses attended)
  - Instructional goal(s) of the courseware
  - Final performance expected of the trainees after completion of the courseware
  - Overall project goal and scope of work

- Instructional Recommendations
  - Prerequisites required
  - Instructional objectives
  - Level of courseware interactivity

- Instructional medium required (e.g. video, 3D animations)
- Macro-instructional strategies to be employed
- Critical development issues
- Lesson content flowchart

Upon sign-off of the CRS (signed off by CAC, USME, ID, SPJM; hereafter called the *sign-off party*), the Courseware Design Specifications (CDS) was written and it detailed instructional strategies (down to the micro level) and design issues. If the earlier CRS indicated the need to include the development of a "scenario" to aid learning, then the Scenario Design Specification (SDS), a document which detailed the scenario flow, was crafted.

Just like the CRS, the CDS and SDS were actually pre-defined forms that were to be completed by the ID assigned for that courseware. If the CRS was deemed to detail "what" was to be taught, then the CDS and SDS may be deemed to detail "how" to teach what was to be taught.

Upon endorsement of the CDS (and SDS, if appropriate) by the sign-off party, the courseware development efforts moved into the *Courseware Storyboard* (CSB) stage. The CSB was a blueprint built by the ID, and it visually detailed, in a frame-by-frame manner, how the completed courseware was to look like. At this stage, the User Interface, as well as all text objects, were inserted into the courseware. Graphics, videos, and animations and audio were not inserted at this stage. Instead, placeholders were used. Additionally, test items with feedback, scores, and weighting were also included. An "instructions" section was provided below each frame, and this section provided for programming instructions, the narrated text for that particular frame, description of graphics, animations and video required for that frame.

Once the sign-off party endorses the CSB, the courseware moves into the *Courseware Development* (CDE) phase, which was the stage when the "eye candy" and "artificial intelligence" were added to the courseware. In other words, the Programmers and Graphics Designers started working.

Typically, the ID would provide the approved CSB to his/her graphics designer, programmer and if necessary, videographer (who was in-charge of all video and audio work) and performed a walk-thru with them on what was needed to be created for that courseware (such a walk-thru usually takes at least half a day). Each team member was then given a timeline to complete the tasks given, and once all media elements had been created, the programmer weaved everything together into the courseware. In a sense, the courseware may be deemed to be "completed" since everything dictated in the CSB was now "live."

Before the final delivery, the courseware is sent through the *Courseware Evaluation* (CEV) stage. The objective of this stage was to ensure that the courseware met the specifications in the CSB, as well as to gather feedback from a small sample group of instructors and trainees to fine-tune courseware. These evaluations were called the *Instructor Try-Out* (ITO) and *Student Group Try-Out* (SGTO) collectively. The ID worked with the school Project Coordinator to collect the responses given during ITO and SGTO. Appropriate suggestions were incorporated into a final round of changes, and the courseware was then delivered, installed and tested at the schools' computer (this is called On-Site Acceptance Testing, or OSAT in short). That courseware was then signed-off as completed and delivered, and a project is completed when all courseware earmarked for a particular school had been delivered.

Upon delivery, the courseware was placed under Warranty and Maintenance, details of which are provided under the section entitled *Change Management Framework*.

Amendments to the Content Development Framework

The building blocks for any customised eLearning content development project are the courseware modules to be built. As can be seen from this project, and the key personnel involved was the ID, since he/she was the only person directly involved in all stages of the *Content Development Framework*. Hence, it appears that success (or failure) of any of the customised eLearning content development projects rested mainly on the hands on the ID. In the first year alone, we noticed that the most glaring issue with the programme was with the quality and timeline issues of some of the IDs. Simply put, some IDs were producing courseware either too slowly (the framework posits that an ID could produce at least 7 hours

of courseware in a year; see Annex A for the *Courseware Development Norm Chart;* see Annex B for a sample *Courseware Development Timeline Chart*) or of inferior quality (e.g. weak instructional design, incorrect linkages).

Originally, it was assumed that IDs, prodded by their SPJMs, would adhere to the timeline set in the PMP and deliver at least 7 hours of eLearning courseware a year. However, the reality on the ground was that very often, meetings got postponed, SMEs were sent overseas, etc, and these factors reduced the efficiency rate of some IDs by up to 50%.

On the issue of quality, it was originally thought that the CSB walk-thru and the OSAT would capture both instructional and technical mistakes. However, that was not always the case. Mistakes slipped by unnoticed, only to be picked up later when changes were much more expensive to make.

As such, we needed a way to ensure that quality and timeline were adhered to. The Head ID and Head Programmer were new appointments created to ensure that a quality product was delivered at the end of the day. The Head ID's role was to ensure a quality courseware in the sense of achieving its intended instructional goals, while the Head Programmer's role was to ensure a quality courseware in the sense of technical soundness. The Head ID also had an indirect feedback loop to the SPJM, and would inform the SJPM if one ID appears to be providing the CRS, CDS, SDS, CSB, etc much later than his/her follow IDs assigned to that school. This way, the SPJMs had a way of taking a much more active role in monitoring the progress of each stage of a courseware so as to prevent deadline slippages.

In the amended framework, all IDs were to submit their CRS, CDS, SDS and CSB for a quality control (QC) check prior to the walk-thru session with the Schools. After review (which takes from 1 to 2 days), each CRS, CDS, SDS and CSB are given a grading of "Approved," "Amendments Required," or "Rejected."

Also in the new framework, prior to each OSAT, the Head Programmer checked each and every courseware to ensure technical soundness (such as no "bugs" or incorrect linkages within the courseware).

Since the amendment (and adherence) to the amended development framework, the quality of the courseware improved from 22% (2000) to 68% (2002) (independently reported by DSTA) and the number of courseware delivered improved from 68 in 2000 to 145 in 2002.

Change Management Framework

The content development framework dealt with the vast majority of courseware developed. However, there were instances whereby certain change requests were made *during* the development of the courseware. The most common example is the wanting to add more content into the courseware, affecting its runtime and, hence, cost.

A key point to note is that once the CSB has been signed-off, any changes to be made to the courseware needed to go through the change management process. This process was long and tedious, and intentionally so. After all, much time and effort had been put into deciding (and approving) the courseware up to the CSB stage, and any requested changes should be evaluated seriously.

For this programme, we find that change management was seldom invoked, and we hypothesis that the reason for this was because of the strong content development framework that was put in place (especially at the Treatment Study and Courseware Requirements Specifications phases). Through the years, we found that if the hard work was done upfront, then the end-phases tended to conclude smoothly.

Conclusions and Key Take-Aways

The content development framework, as well as the change management framework used in this programme, had been instrumental in the successful completion of this programme. The frameworks provided a clear process methodology for what needed to be done, by whom, and by when; it formed the backbone of our entire ePM for this programme.

The amendment of the original content development framework (e.g. to include the roles and duties of the Head ID and Head Programmer), was significant in improving the quality and timeline issues the original content development framework did not adequately address. This reinforces our belief that good project managers should not be overly dogmatic

in their use of established frameworks and models, but rather, be willing to amend or add on to the framework to deal with issues that may arise.

Finally, we must mention that the success of this project is also due to the fact that all the key people involved in the project understood the *intentionality* of each phase, and staff on the ground running the project knew that when in doubt, they were to follow the *spirit* and not the *letter* of the "law." This mutual trust and understanding really helped in moving the programme along those three years.

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Chapter 10

Leading eLearning Projects in British Columbia Schools

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Abstract: Sound leadership and good management practices are critical to successful adoption of elearning programs. While leadership, reform and project management have been well studied and documented in the literature, little has been written on the role leaders play in the success or failure of elearning program implementation. Traditional project management principles do not adequately describe elearning project management. Emerging leadership and complex adaptive systems theories provide new insight into fundamental assumptions about change, control, order, organizations, people and an overall elearning project leadership. A study of a new organization designed to support elearning in the BC K-12 school system was conducted to determine how project leadership influenced change within the BC elearning community. The study reaffirmed the critical role of a project leader in systemic change and confirms that without a clear vision, collaborative leadership, and a systems approach, organizations could commit precious resources to elearning without much success.

Key words: Leadership, K-12, complexity theory, strategic planning

Just as the internet has become integral to our lives, it has also begun to change how we think about the organization of learning. Most K-12 school jurisdictions throughout North America and Europe have already developed some type of elearning program, or virtual school, taking advantage of the flexibility elearning provides: students can arrange schedules around other responsibilities such as jobs, medical issues, or travel; collaboration among students in different geographic locations is enabled; students can learn from experts in other countries or locations; and students can control the pace and content of their own learning and learn from home.

Understanding how leadership influences organizational development and adoption of e-learning is clearly a central question in e-learning project management. The quality of leadership is a primary indicator whether technology funding will be spent wisely or wasted.

With the release of an enrolment cap on K-12 distance education programs in 2002, the growth in elearning programs in British Columbia (BC) more than doubled in 2004, and the number of elearning programs is projected to continue to grow (Ministry of Education, 2005). eLearning programs have flourished in BC's K-12 schools largely due to the influence and leadership of a few key individuals leading projects to actively integrate educational technologies within existing learning programs, and at the same time, creating new organizations and structures within a growing elearning community to support these new programs. Leaders in the British Columbia K-12 elearning community set out to form a provincial organization, BC Ed Online, with the intention to create a central body to:

- Manage course development,
- Broker provincial software and resource licence deals,
- Share a structure for technology integration and use,

- Create standards for development and use of elearning course materials,
- Support professional development for teachers using elearning technologies, and
- Represent collective district needs to government and other provincial bodies.

Leadership for eLearning Project Management

Principles of project management evolved from a need to control large development projects, and the difficulties of estimating and managing these efforts to reliably deliver results. Methodologies drew heavily on engineering principles applied in construction management, and stressed predictability and linear development cycles – relying on task breakdown, predicated requirements, analysis and stable, rigid design. While these methodologies work in some instances, for elearning projects these methodologies add cost and complexity, while providing a false sense of security that management is steering the implementation or change process. More than half a million new information technology (IT) application development projects were initiated during 2001 (Standish Group, 2001), despite the fact IT projects have a terrible track record. A study in 1995 found that only 16.2% of IT projects were successful and over 31% were canceled before completion, costing over $81 billion in the U.S. alone (Standish Group, 1995). Within the K-12 school system, school improvement and reform have been well studied and documented in the literature. Yet prior to the 1980s, the literature was silent on the role leadership plays in success or failure of educational innovation or project management, and Hargraves and Fullan (1998) analysis of school reform literature concluded that reform efforts had a dismal record of accomplishment as well.

Leadership is central to determining and articulating a vision or philosophy and goals, and articulating this within community. Indeed, systemic change is inspired by moral purpose and the confluence of the intellectual, political and spiritual in both personal thinking and action (Fullan, 1993). Traditional management theory, particularly project management, is based on a scientific model approach. It assumes predictable and manageable risks, static organizations and hierarchies, and structured control to manage change. However, new management principles, based on the principles of chaos and complexity theory (Wheatley, 1992 & 1999), have led to the rise of complex adaptive systems thinking. Complexity, according to George Cowan, refers to "systems with many different parts which, by a rather mysterious process of self-organization, become more ordered and more informed" (Cowan, 1994, p.1). In some cases, an intended outcome can be created, but the person does not control the change, merely influences the system to initiate a change. This complexity exists within the BC elearning community, and is reflected in the processes that have influenced the creation of BC Ed Online. Change, and elearning adoption within the BC elearning community, can be described as a kind of self-organization within a complex system resulting from enhanced interconnectedness and connectivity to the surrounding elearning community.

In the case of the development of BC Ed Online, traditional leadership and project management principles could not fully explain the conditions and events leading to its formation. There is a lack of alignment between planning for elearning adoption and traditional project management principles, symptomatic of differences in assumptions about change, order, and the development of organizations. Traditional project management views manager as "taskmasters", developing, monitoring, and controlling a master plan that documents in detail the tasks, dependencies, and resources required to deliver an end product. Within this approach, individuals are viewed as interchangeable, controllable commodities – not dynamic, interdependent agents within a community. Traditional "command-and-control" project management is not easily imposed on teams of knowledge workers, particularly in the academic sector or elearning community. Project leadership is required. Project leaders are more than just managers – they combine vision, communication, good management and technical skills with the ability to plan, coordinate, and execute. They keep the focus on the vision, inspire teams, promote collaboration, champion the project and remove obstacles to progress.

Traditional views of project management emphasize variable identification, planning and control – not leadership. If the goal of elearning project leadership is to engage the community, inviting ownership of problems and inviting community constituents to become agents of change themselves, then leadership is about creating the conditions and processes to support the likelihood of this to happen (Fullan, 2003). This starts with moral purpose and a compelling idea that captures attention and interest, becomes a shared vision that is clearly communicated, advocated and supported. Indeed, several studies cite top management commitment as one of the key factors associated with project success (Standish Group, 1995). By creating the conditions for change, not controlling them, adoption of elearning takes on new approaches. Though not predictable, the conditions that support elearning adoption can be influenced and encouraged, ensuring success, albeit with an outcome that is not always easily articulated at the beginning of the process.

Project leadership activity in the British Columbia K-12 elearning community began out of necessity. The number of schools providing elearning programs was increasing, as the Ministry of Education had removed the limit on the number of programs allowed in the province, and each district encountered similar challenges in developing their own program. There was a growing demand for online learning, and suitable materials for the newly developing programs did not exist. Commercial vendors and existing content developers were not meeting the needs for those working with students online in the non-Distance Education schools.

The leaders of BC Ed Online had a clear vision, were highly motivated and hard working – finding it difficult to say 'no'. They were focused on learning, were clear and consistent communicators, had a clear focus on strategic goals, and were passionate about what they did. They were driven by the collective vision described at the 2003 DE Visioning Session, and how that vision was articulated and communicated by them widely in meetings with elearning advocates and stakeholders throughout the development of BC Ed Online's first strategic plan. That plan captured the vision, mission, and goals of the initial visioning session (BC Ed Online, 2004), and was a key component for these leaders in the BC elearning community.

Conclusion

The study of BC Ed Online and adoption of elearning in the BC elearning community reaffirmed the critical role of a project leader in systemic change and confirms that, without a clear vision, collaborative leadership, and a systems approach, organizations could commit precious resources to elearning without much success. The study found that leaders within the BC e-learning community believed educational technologies were a catalyst for changing how learning is organized and supported, and that policy is of key influence in education, and in some instances precedes change and reform. Despite a critical lack of resources to support new and emerging structures, a shared vision, collective goals, and a passionate belief in the ability of educational technology to support change was compelling enough to sustain the leaders in BC Ed Online for two years after the organization first formed. It is hoped that the study provides the reader with an insight into how leadership is expressed within a community of practice – BC's K-12 elearning community – and an understanding of the need for a broader definition for project management in elearning adoption.

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Chapter 11

The Communications Challenge: Migrating "F2F" to e-Learning – *A true story*

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Abstract: This chapter focuses on the migration challenges of a well-established face to face (F2F) – university certificate program to an e-Learning environment. The Certificate in Adult Learning (CAL) was developed in the early 90s. Instructor/facilitators, many of whom were involved with CAL from the onset, were key stakeholders in this project. These creative/ broad-minded individuals were a 'community of like-minded souls', deeply committed to CAL. Some expressed concern that the program integrity and essence of the CAL 'culture' would be seriously compromised, if migrated online. Operating budgets were dwindling, however, and other stakeholders (internal and external) felt that migration was critical if CAL was to survive and thrive. This is a story of challenges faced when attempting to respond to conflicting stakeholder needs. This story emphasizes an authentic and strategic response to the 'human dimensions' of project management.

Key words: Project management, Migration, e-Learning, Technology, F2F, Online community, Stakeholders

To *manage* conjures up many images, namely, to direct, to control, to supervise. To manage is a broad topic and applies to any number of situations and contexts. Even though it may not be stated in a job description (it is often not), an effective manager of projects is also someone who understands the *needs of the people* involved in the project, needs that tend to surface in times of change and transition. While specific strategies and tools (e.g. developing a project plan/roadmap, visioning and tracking with Gantt charts, project management software) all contribute to project management success, the effectiveness of these strategies and tools will be significantly determined by the attitudes, beliefs and abilities of those who apply them *and* all of those who are impacted by them.

In addition to having a solid understanding of all that project management entails, project managers who achieve excellence are people who: can see the big picture; have foresight; are strategic thinkers; have strong analytic and problem-solving skills; welcome the unexpected; adapt to the unanticipated; communicate confidence in themselves and others; understand and address motivational issues; and are authentic, inclusive communicators. This is a tall order but an ideal that we all need to aspire to if we wish to achieve excellence in the work that we do.

An effective project manager must have multi-faceted skills as managing a project is a multi-faceted process. This is why we have chosen to focus specifically on the importance of 'people' in the project management process. Specifically, we will

highlight communication and inclusion processes that, if designed and handled *with care*, have the potential to significantly impact the ultimate success of any project. Having authentic, strategic and inclusive communication practices that welcome a diversity of perspectives, from *all* who have a vested interest in the project, i.e., *the stakeholders*, makes a wise project manager indeed. Such an individual recognizes that differences of opinion and perspective, although challenging to manage, are often what distinguishes project management excellence from mediocrity. From our own experience, we have come to appreciate the potential richness of a final project when diversity in stakeholders' perspectives and approach is sincerely welcomed and valued.

In this chapter, we explore the migration of a F2F (face-to-face) university certificate program to the elearning environment. As we reflect on the images of managing showing a need "to direct, to control, to supervise," we are particularly attracted to the deeper, more challenging aspect of skilful and successful project management, that being, to achieve one's purpose while treating everyone involved *with* care. The term *with* is central to the message in this chapter, as *with* communicates collaboration, cooperation and community.

This, then, is a story about *treating with care*. Collaboration, cooperation and the recognition of the critical importance of 'community', all central to project success, are the necessary tools if one hopes to achieve this ideal. The migration of a F2F, course-based, university certificate program, to the e-Learning environment, is this story. This is a project in process; the ending is yet to be written.

Task-at- Hand – *Objectives*

Times were '*a changing*' and the University of Calgary was no exception. It was 2002 and delivery of selected courses and programs, via online delivery, was moving at warp speed. Many program areas had already embraced the challenge and had done so successfully. We were all learning a great deal and 'mistakes made' in one project, evolved into 'potential discoveries' for the next. These discoveries, if realized, would serve to contribute to a better product the next time around. Sights were now set on developing strategies to sup-port the migration of a continuing education, F2F certificate program to an e-Learning environment. The CAL (Certificate in Adult Learning) program became our focus.

Planning the migration of CAL to the eLearning environment was a major initiative; CAL had a solid reputation in the community and had been successfully functioning for over 10 years as a F2F program. Many instructor-facilitators *and* adult learners (participants) were strong advocates for preserving CAL in its original F2F form. These were individuals deeply committed to the philosophy and guiding principles of CAL and there was fear that these principles would be compromised if the courses were moved online. Some instructor-facilitators and participants in CAL were public with their questions and concerns.

"CAL is based on the premise that knowledge and learning is greatly assisted through interpersonal communication and feedback. Would not the richness of this opportunity be lost online?"

"As deep learning is significantly impacted by process and by the dynamics that form in groups, how could I effectively address and facilitate these dynamics in an online environment? Does not this medium focus mainly on text-based learning? How would I create the space online to allow for the important elements of group dynamics?"

Not all stakeholders voiced these same concerns, however. Feedback from industry communicated strong support for moving CAL online. Courses would then be more readily available to the *primary stakeholder*, industry employees, regardless of geographical distance. These were the people who would ultimately determine the success and longevity of CAL. Clearly, there were tensions to be resolved if this migration initiative was to succeed.

Decreasing operating budgets also motivated this shift in thinking as it was believed that, by putting CAL online, the

university hoped to get 'more bang for the dollar'. The need to become *cost-effective*, in light of decreasing budgets, was another strong motivator. There was caution, however, in the minds of some, as the jury was still out on the cost-effectiveness debate. The literature suggests that this is still the case! Clearly, there were many tensions to be addressed.

Specifically, project objectives included:

- Determine feasibility of delivering CAL online;
- Educate stakeholders;
- Secure stakeholders' commitment;
- Design strategies and a plan for migrating an established F2F program to an e-Learning environment.

The intended outcome was to successfully migrate CAL to an e-Learning environment, whilst preserving program 'integrity' and 'culture'.

Our Role and Challenges

Change brings with it many challenges. This was certainly the case in this migration project. The words of *Tao Te Ching* are a strong reminder that change brought about successfully, unfolds one step at a time:

Yet a tree broader than a man can embrace
is born of a tiny shoot;
A dam greater than a river can overflow
starts with a clod of earth;
A journey of a thousand miles begins at the
spot under our feet. ..

Our first step was to engage and gain the trust of individuals who had been the original pioneers of CAL. If this project was to succeed, instructor-facilitator and 'learner' trepidation was clearly a challenge needing to be addressed. These were individuals who were passionate about preserving the philosophy and purpose as originally spelled out in the CAL program documents of 10 years past. It was critical to recognize the concerns of these individuals and, at the same time, remain open to 'new' stakeholder needs, stakeholders who would come on board in support of this migration project. Balancing what appeared to be conflicting tensions was no easy task! It is *too often* the case that in the interests of progress, voices of individuals from the past are not recognized or valued. We were deeply committed to creating spaces for all stakeholders, past and present and to gaining buy-in from CAL instructors who, in essence, had nurtured the development of CAL from the grass-roots to the present.

The university had been heavily subsidizing CAL from its inception, with base-budget funds. Due to decreasing operating budgets, CAL needed to shift to a cost-recovery mode if it was to survive. This would also significantly impact how instructor-facilitators were remunerated for teaching. The 'old' CAL model provided funds so that instructor-facilitators were paid *per course*, regardless of class size. In addition, there were funds set aside for course development. Although these funds were limited, they provided some support for ongoing course evaluation and development. With this model, courses developed by instructors remained the property of the University of Calgary.

The need to significantly restructure this method of payment for teaching and development coincided with plans to migrate CAL to the e-Learning environment. The new plan was to pay instructor-facilitators *per participant* rather than per course. Instructors would receive an agreed upon dollar amount for *each* participant who completed the course that they were teaching. This amount represented a revenue-sharing model, in that 50% of the tuition for each participant was then paid to an instructor. For example, if the instructor was to receive $200.00 for each participant completing their course (tuition per course = $400.00) and if 18 participants completed the course, the instructor would be paid $3600.00 for teaching a 40 hour course. However, if the instructor 'next door' had only 8 participants who had paid the same tuition, for a course that entailed the same length of course time, they would only be paid $1600.00.

The concern expressed by some instructors was that although grading assignments would likely be more labour-intensive for a larger class, the effort and planning needed to teach either course would be more-or-less the same for both instructors. Others felt that smaller class size required less work on

the part of the instructor. For example, if there were 8 participants in an online course, this would require significantly less time for the instructor as they would be responding to postings from 8 participants rather than 18. This argument weakened, however, from a F2F perspective, in that instructors would need to be in attendance for the same number of hours whether it was for a class of 18 or a class of 8. With regards to F2F delivery, this perception of potential inequity among instructors was a significant concern.

This also brought about an additional but related challenge. Although it was becoming increasingly more difficult to accommodate losses incurred by running courses with low numbers, under the old model of instructor reimbursement, participants in CAL courses sometimes ranged anywhere from 7 or 8 participants to 20. Regardless of class size, instructors received the same pay. Staying with the F2F model, but under the new system of instructor reimbursement, there is less monetary incentive to teach a F2F course.

Another shift was that monies were no longer available for course development. In light of this, courses developed by an instructor would now be the property of that instructor. Some supported this shift; others considered it to be a detriment with regards to running the risk of jeopardizing the continuity and flow visible in the content from one course to the next.

Critical to the success of this project management initiative was the navigation and delicate balance of skill required to maintain instructor involvement, whilst preserving the commitment of those instructors who had contributed so significantly to CAL's success over the years. At the same time, instructors needed to be aware of the potential advantages of shifting to a new model. Although decreasing budgets played a major role in motivating a new way of thinking, there were other potential advantages to this new model that went beyond cost effectiveness.

The Technological Challenge

The guiding principle in all CAL courses is that learning extends far beyond traditional classroom settings and text books. Wideman (2000) distinguishes between principles and practices by stating that principles refer to *why* we are doing something; practices refer to *what* we are actually doing. CAL addresses both of these concepts. Although most instructors agreed that online could be an effective learning medium, many questioned how the *practice* of meaningful dialogue, a critical component of CAL, could be effectively transitioned to the online environment. In addition, instructors and participants also varied greatly in their technological savvy. Some were very comfortable with technology and had previous elearning experience; many had no experience with all that technology could do, beyond e-mailing capability. Determining the type of initial training *and* ongoing support needed to ensure a successful transition, from F2F to elearning delivery, became a *key* consideration.

The Stakeholder Challenge

In the words of Wideman (2000), "Project success is much more than just doing what you set out to do. It is also about whether what you are doing is, in fact, the right thing to do. We believe that the ultimate goal of a project, and therefore its measure of 'success', should be satisfaction with the product on the part of [all stakeholders]" (p. 8). There were many stakeholders that had a vested interest in the migration of CAL to the e-Learning environment. Assessing the needs of *each* stakeholder group and communicating what motivated the transition from F2F to online were of critical importance. The success of this project was dependent upon the development of a climate of trust and support amongst *all* stakeholders.

Risk Management

In any new initiative, one must anticipate the risk[s] involved. Failing to do so may, in fact, jeopardize *or* compromise the entire project. What then were the potential risks in transitioning CAL from F2F to the e-Learning environment?

CAL is dependent upon internal (university) and external (community) support. This initiative needed to appeal to those currently involved in CAL, those who would take CAL in the future, and the businesses and organizations that would support their employees and volunteers in the completion

of a CAL certificate in the interests of personal and professional development.

According to Normington (2005), it is critical, when assessing risk, to decide on the required mitigation action, to put it in place, and then do it. Although we could write an entire book on the risks involvement when migrating a F2F program to an e-Learning environment, the critical questions that follow address some of our key communications management concerns.

How could we gain buy-in from CAL instructors who, in essence, had nurtured the development of CAL from the grassroots to the present?
Of course, not all stakeholders were in support of this migration and this was clear regarding some instructor-facilitators who had been with CAL since it conception. These were deeply committed individuals, involved at the onset in the development and instruction of CAL, individuals who had committed a great deal of time and energy developing the CAL philosophy and guiding principles.

Communications management is critical and individuals who can (potentially) impact the success *or demise* of a project are often those who have been intimately involved in its design and development in the earlier stages. We cannot overstate the significance of gaining the trust and the 'buy-in' of individuals who have developed and nurtured a project from the grassroots to its present.

To gain trust and 'buy-in', we:
a) Invited key individuals to dialogue in a larger group forum;
b) Provided up-to-date communication on the history and purpose of this initiative;
c) Worked closely with those instructors who remained open to this change;
d) Engaged these individuals in the day-to-day communications and decision-making process;
e) Solicited diverse opinions and perspectives;
f) Respected that perceived 'losses' of the 'old' deserved grieving space, *before* space could be created for the new';
g) Searched for all the documents that provided information on the development of CAL.

Sincerely welcoming the involvement of individuals who have significantly contributed to the developmental history and delivery of a program, in its original form, contributes to a climate of trust and provides valuable opportunity for these individuals to commit to a plan that they can ultimately call "their own."

How do we maintain the involvement and preserve the commitment of those instructors who contributed so significantly to CAL's success over the years?

Gaining trust and commitment, at the onset, is critical. Maintaining this trust and commitment, however, requires additional insight and strategies.
To maintain trust and commitment, we:
a) Provided ongoing opportunities to voice opinions and ideas;
b) Designed open, *easy* access to the project manager ultimately responsible for the management of communications and *all* other aspects of this migration initiative;
c) Updated information on a weekly and monthly basis;
d) Provided instructors with detailed information regarding the adjustment of pay for courses taught (e.g. 50% of tuition paid for each participant completing their course versus a flat course rate instructional fee).
e) Provided detailed scenarios as to how this could actually be an instructor's advantage. In effect, instructors would now be entrepreneurs, promoting their own course[s] with the hopes of attracting additional participants;
f) Detailed how instructors would also be the ultimate decision-maker if they chose to run a course in spite of low enrolment;
g) Educated instructors on how online teaching and learning encouraged a more student-centered approach.

Making communication a priority allows for rich dialogue amongst all stakeholders during times of great change. This became particularly evident in the dealings with 'pioneer' instructor – facilitators. Although there will always be those who choose to disengage from a project (due to having 'too much history' with the 'old' to be able to

support the 'new'), this is a choice that needs to be respected by the project manager and by all those who remain on a project. Attending to this type of communication and process conveys sincere respect and support for those who may choose to sever their involvement, in that they will be able to make an informed choice as to whether to support the change or not. This set of beliefs and process are critical if we hope to succeed when managing a project initiative.

Creating space for valuable knowledge to be shared by and amongst instructors, easy access to the project manager, honest and updated communication as to the status and details of the project, and educating instructors as to the potential advantages of this migration initiative, significantly contributed to gaining the ongoing trust and commitment of instructors who had pioneered the development and delivery of CAL in its F2F form.

What type of initial training and ongoing support for instructors and participants were needed, to ensure a successful transition from F2F to e-Learning delivery?

For those who have experienced a well constructed and inclusive e-Learning environment, there is a sense of excitement when involved in the migration process from the F2F medium. CAL had the reputation of being a stimulating, creative, learning-filled program, however, a program that encouraged high interaction and involvement from participants. Many who had taken CAL courses spoke to the value of the F2F nature of the program, stating that this would be difficult if not impossible to replicate in an e-Learning environment. Spencer (2004) addresses this concern when referring to the social component potential of virtual classrooms and maintains that:

When students are linked in a community or environment group, DE (in common with other education for adults) can become social education. Trying to recreate community in the electronic classroom becomes easier if the students themselves are committed to a real community or shared social purpose. They can then use their 'individualised' studies and their remote classroom as a basis for their community-based social action. (p. 197)

Bates (1986) cautions providers and managers of online delivery by emphasizing the value of the online medium:

...the computer as merely a channel of communication between learners and teachers. In other words, the computer is part of a network, allowing learners and teachers to communicate directly with one another, on-line but asynchronously and at a distance. The structuring of the teaching is not contained in or restricted by the architecture of the computer, but developed and negotiated between learners and teachers. (¶ 3)

To educate instructors and participants on the potential richness of inclusion and interactivity in e-Learning environments, we:

a) Provided opportunities for individuals to view and sample online courses;
b) Encouraged individuals to participate in online 'Discussion Boards' for the purpose of experiencing interactivity with those they could not (physically) see;
c) Developed training materials so that instructors had templates and structures for moving course content to the online medium;
d) Designed numerous *Professional Development* sessions for instructors to receive training in developing online courses and facilitating online discussions;
e) Identified numerous techniques for stimulating online activity;
f) Provided financial support for instructors to participate in additional training;
g) Communicated regularly with course participants and provided opportunities where CAL courses would incorporate an e-Learning component within the F2F course offering;
h) Communicated and provided hands-on examples that demonstrated that online content could still be provided and taught but it would not be designed and developed in the same way as when delivered F2F.

Resistance to change is often determined by the degree of confidence that others have in the new vision. This confidence is

significantly impacted by how much information and understanding there is around what this 'new product' will look like. People need to be able to 'see' where they are going and will resist if they feel blinded by a lack of process or a lack of design for a final product. Addressing this need is critical if we hope that key players will follow our lead. Paramount is that we acknowledge that a change will in fact be taking place, and this change will impact what the final product looks like. It *will not* and *cannot* look the same as what currently exists. E-learning is a very different medium from F2F and the end result will be different as well. This *does not mean* that the integrity, philosophy and guiding principles of a program will lose it. It *does mean*, however, that the design of the program will have a significantly different look. It serves no purpose to pretend that everything will be 'almost' the same. In spite of the best of intentions, employing this strategy is sure to bring about project demise.

How would we foster a climate of trust and support amongst <u>all</u> stakeholders as we understood the success of this project was dependent on this? What communication management strategies would we use?

Instructors and participants were key stakeholders but there were needs of other stakeholders needing consideration. Migrating CAL from a F2F to the e-Learning environment meant that we wanted to market this program far beyond the geographical boundaries of Calgary, Alberta. It was our hope to interest new individuals to enrol in CAL and to entice organizations, not yet involved with CAL, to support the participation of their employees as a professional development activity.

Stakeholders were wide ranging and as unique as the program itself. They came from industry, academia, municipal, provincial and federal governments, small non-profits and social action organizations. Diversity was also reflected in those who developed and taught CAL courses. Instructors, another key stakeholder group, included adult educators, business consultants, community organizers and teacher-trained individuals, all committed to the philosophy and principles of adult education and lifelong learning.

The commitment to keep *all* stakeholders in the loop as to the ongoing development and migration of CAL from F2F to e-Learning, was a priority. Many avenues of communication were utilized so that stakeholders would not only receive information, but would have the opportunity to provide ongoing feedback on the impact that this migration. Many meetings were held, providing stakeholders with opportunities to voice their thoughts, concerns and ideas in a F2F medium.

Web conferencing software (also known as *computer conferencing technology*) was utilized to provide stakeholders with the opportunity to meet online in 'real time', to share ideas and to give ongoing feed-back. Web conferencing proved invaluable as it allowed individuals to participate actively, from a variety of locations. The CAL program was migrating to the online medium and it was critical to demonstrate that inclusion of individuals, regardless of geographical distance, was an asset, not a liability. Camm (2002) reminds us that, "... learning communities are collaborative and supportive, which foster teamwork through trust, openness, honesty, and respect among members" (p. 1).

We were convinced that if onsite stakeholders and those from a distance felt authentically engaged and valued in the role of supporting the migration of CAL from F2F to e-Learning, they would be more likely to promote CAL to others as a viable option to education and lifelong learning. We were clearly addressing the needs of stakeholders who were already involved with CAL (instructors, course participants, and community organizations); it was not time to focus on individuals and organizations not yet aware of CAL and its value to personal and professional growth.

To foster a climate of trust and support amongst <u>all</u> stakeholders, we:

a) Developed an extensive marketing strategy that would reach current and future stakeholders through traditional marketing channels;
b) Encouraged current and potential stakeholders to participate in F2F and Web conferencing dialogues to share needs, opinions and resources;

c) Kept communication channels open and easy to access;
d) Engaged advocates of CAL to spread the word;

Conclusions

We continue to learn many lessons; the learning curve in communications management is steep indeed! Although we have always been committed to recognizing the critical importance of the 'human factor', the following *lessons* serve to be a strong reminder that there is *always* much to strengthen and improve upon:

- Although the commitment to free-flowing communication, with and amongst stakeholders, provided a strong forum for expression of concerns, it did not dispel the concerns of some who had been the early pioneers in the development of CAL;
- To move a F2F program to the e-Learning environment, in our experience, is not as difficult as is the challenge of preserving the integrity and culture of the program that is being transitioned;
- With this in mind, we need to revisit original plans to migrate a program to ensure that the decision to transition the program remains in the best interests of the program *and* the stakeholders;
- Although imposed time-lines are not always sensitive to this, change takes place one step at a time. To rush transition could jeopardize a project that otherwise, may have survived if a reasonable time-frame was available;
- A solid infrastructure is needed to successfully support *and* resource a migration project such as this.

When CAL received base funding from the university, the program was mainly controlled and directed *by* the university. This is the case when any project is dependent upon one main funding agent as the key stakeholder. With the migration to the e-Learning environment, coupled with CAL transitioning to a cost-recovery model, there is a stronger need for a 'community of others' to direct and transform CAL to its new form. This need continues to serve as a catalyst for a high level of involvement and interactivity amongst all stakeholders. With increased involvement and interactivity, we are experiencing a strengthening of commitment to CAL's success in the e-Learning environment.

This story continues to unfold. At present, *most* of the CAL courses have been transitioned to the e-Learning environment. Core courses, however, those that all participants are required to take (in addition to the optional courses that they select), continue to be offered in both formats, F2F *and* via the e-Learning medium. Some stakeholders have identified the need to have core courses made available in both platforms; we continue to respect this need. This allows for participants to complete all courses entirely from a distance, F2F or in a fashion that provides access to both mediums. We believe that this honours the integrity and culture of CAL.

We encourage organizations and project managers to recognize that, although management tools and strategies greatly increase the chances of project success, the ability to recognize the importance of a well developed communications plan *and* to implement this plan with insight, authenticity and integrity, is paramount. Project maps that clearly outline direction and goals will prove invaluable. Data bases to store narrative and statistical information are necessary. Consulting the literature to keep informed of *Best Practices* in project management strategies and techniques is indisputable. PMBOK (2004) is an excellent and reputable resource and emphasizes an increased clarity and focus on processes.

The process of *inclusion*, in order to overcome psychological fears(s) and mental barriers, "is as important as solving lack of access to networks and related equipment. The digital divide is not only technological [it] is also mental" (Barcelona, 2004). Without an inclusive and integral communications plan, one that sincerely invites and values diversity of perspective, we are left with 'half-baked' mediocre projects, projects that lack support and commitment, projects that fall significantly short of what we *all* aspire to – and that is – *excellence* in project management.

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Chapter 12

Moving the Residency Requirements to Virtual Vermont

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Abstract: This chapter presents preliminary results of a case study to determine the key elements in the creation of a "virtual residency" option for a forty year old distance undergraduate program for adults. During the face-to-face version of the residency, learners become oriented to the program, learn how to access student services, learn to use the course management system, and engage in the study planning process to create a fifteen credit academic plan for the term. At the mid-point in the project, key indicators of success are reported as 1) excitement and creativity, (2) pressure to boost enrollment, (3) attitudinal shift to accept an online option, (4) preservation of the residential model, (5) early and full involvement of key individuals and departments, and (6) adaptability to other areas of the university. The relationship between these key indicators and the non-hierarchical nature of the project management process is explored.

Key words: Distance education, adult education, residency, student services, course management system

How does an adult, distance education institution that defines itself as progressive and learner-centered embrace online teaching and learning without changing the pedagogical models that it has come to rely on for more than twenty years? While for-profit competitors move rapidly to capture the online adult higher education market, the faculty members who participated in creating the “experiment” in individualized degrees for adults in the early 1960s are only now beginning to reconsider their former stance.

Steeped in the tradition of John Dewey, Vermont College of Union Institute & University has been offering individualized learning for adults since 1981 when Goddard College's Adult Degree Program was bought by Vermont College of Norwich University. This chapter offers results of case study observations and interviews with individuals from academic and service departments working collaboratively to create an online option for the Vermont College Undergraduate program (formerly known as the Adult Degree Program or ADP). Seeking to work democratically, in much the same way individual faculty members work with learners at Vermont College to negotiate learning contracts, instructional technologists, librarians and writing support staff worked with faculty and administrators to lay the groundwork for an online residency experience. This unique project management process, in which ownership and responsibility are shared, is explored for its strengths and weaknesses. This first online residency took place in February 2005 with all of the quality and uniqueness of the face-to-face residencies that take place on our campus in Montpelier, Vermont.

Project Objectives

The following objectives were developed through months of weekly meetings in which democratic decision making led to a new program option plan. This option is for learners who choose not to participate in a face-to-face ten day residency, yet want the same experience. All of the objectives below have been met, with the exception of the final one, which requires more time to adequately measure.

- Replicate the face-to-face residential experience

- Adequately communicate program structure
- Provide orientations to learner services: writing lab, time management, library, and technology services
- Explain the study planning process
- Match learners with mentors with appropriate expertise to facilitate learning in individual learner study areas
- Develop curriculum in collaboration with mentors for one 15-credit term of interdisciplinary study
- Transmit organizational and program culture

Project Stakeholders

The Virtual Residency Project's stakeholders include upper level management (President, Provost, and President's Council), middle management (Deans and Directors), faculty and learners. The President and Council members were concerned about boosting enrollment, successful technology use, and academic quality, for a new program option. In addition to shared concerns about enrollment and academic quality, the Dean of the Vermont College Undergraduate program (VCU) was hopeful that he could win over faculty skeptical about online learning. The Director of Lifelong Learning, in charge of the institution's continuing education department, is charged with promoting and supporting online learning efforts. Admissions staff were interested in the uniqueness of this new option, how it differs from the residential options, how to market it, and how to facilitate implementation by the target date. They were especially excited to respond to the majority of inquiries who want a non-residential option.

The directors of the learner services departments were concerned with how to create asynchronous orientations - bibliographic instruction and information literacy as well as orientation to the online writing lab, resources for time management, use of the course management system, etc. Similarly, the administrative offices wanted assurance that their services were accurately represented, such that learners could avail themselves of what they needed at the right time. The director of the administrative computing department was responsible for new hardware and software for the Virtual Vermont faculty, and changes to VCU department web pages.

The VCU faculty and staff shared concerns about the preservation of the program and its model in the face of competition from other fully online adult programs, and job preservation. They were also concerned about being understaffed while taking on a new program - with the exception of one position, seven out of nine staff positions changed due to layoffs, resignations or moves to other positions within the university within one year.

This author, the Director of Instructional Technology, shared concern for promoting and supporting online learning efforts with the Director of Lifelong Learning with more focus on direct technical than administrative support. Instructional Technology was also responsible for faculty development, learner technical support, and the course management system budget. The Assistant Director of Lifelong Learning was trained to coordinate enrollment for the Virtual Residency and the online course spaces for independent study thereafter. I also supervised the Instructional Technologist who worked directly with faculty to train them in three primary uses of technology: *Elluminate* (desktop conferencing program) for recorded faculty presentations with audio, the course management system for both the virtual residency space as well as their own individual spaces for work with learners on their individualized study plans, and development of personal faculty web pages. I also assisted faculty in consistent instructional design decision-making. Likewise, faculty personal web pages were developed according to a template in which all would include the same minimal elements.

Virtual Residency Project Activity

Case study results identified the key elements in the VCU Virtual Residency option project management experience that made it possible for this academic program to produce an online option. A secondary purpose is to determine how these results might be applied to the other nine undergraduate, masters and doctoral programs at Union Institute & University or at other adult education institutions.

Case study observations by this participant observer were taken during planning meetings, email exchanges and through interviews with administrators, faculty and administrative staff. Full participant observation, as Denzin defines it,

"simultaneously combines document analysis, interviewing of respondents and informants, direct participation and observation, and introspection (Denzin 1978, 183)."

My intention was to experience the project as both insider and outsider to best understand and describe the setting and events to an outside audience. As Patton explains, "Experiencing the setting or program as an insider accentuates the participant part of participant observation. At the same time, the inquirer remains aware of being an outsider. The challenge is to combine participation and observation so as to become capable of understanding the setting as an insider while describing it to and for outsiders (Patton 2002, 268)."

I obtained permission from all faculty, administrators and staff involved in the Virtual Residency Option to use interview notes, email messages and face-to-face meeting notes and observations as part of the study. Responses to an informal survey with open-ended questions sent in an email message were also solicited. Those questions included,

1. What do you think are the primary reasons we were successful in moving forward on the Virtual Residency?
2. Why do you think that the staff and faculty were so receptive and supportive during the demonstration of the Virtual Residency event?

Virtual Residency Project Activity Process

During each phase, management was shared amongst the Director of Lifelong Learning, the Director of Instructional Technology and the Dean of VCU. Through weekly meetings and email, a shared vision and goals were developed collaboratively, including involvement of learner services departments and admissions. Designing the scope of the project, identifying key tasks, scheduling and budget preparation were all shared amongst the three main departments involved. Even implementation and monitoring changes to the program became shared responsibilities.

These three individuals brought together additional departments to work on the project by inviting individuals to weekly brainstorming meetings beginning in March, 2004. At first only faculty members and the dean were invited to participate, but quickly admissions and other learner services departments besides Instructional Technology were added. Because the project had not yet been granted more than informal support and approval of the Vice President for Academic Affairs, the President, and the Board of Trustees, the group and meetings were called, variably "the non-committee," "the Online ADP Sort-of-but-not-really-a-Group," "non-group" and "our next non-meeting." An exciting, nearly conspiratorial tone was set from the beginning with this tongue-in-cheek word choice. Later when the project was officially sanctioned and supported, it came to be known as the "Virtual Vermont Residency Option."

Not all of the participants joined at the beginning, so when they did come to meetings, they were advised to review previous meeting notes taken mostly by one faculty member and alternatively by one of the three primary initiators of the project: the Dean of Vermont College Undergraduate, the Director of Instructional Technology, and the Director of Lifelong Learning. Discussions about how to resolve problems and issues with transference of the residency components to the online environment were discussed and sometimes re-visited as new members of the group were added or only sporadically attended meetings. Much discussion also took place over email since faculty members work from home at a distance; several participated in weekly meetings via conference call. By the summer of 2004 online methods for fulfilling each residency component were developed as part of a truly democratic process in which all those who participated were afforded a voice and worked toward consensus-building. Ongoing work continued on this project as faculty members were selected to teach in the online option and the Virtual Residency space was refined.

A pivotal event that took place in September, 2004 was a demonstration of the Virtual Residency itself in eCollege, a course management system, as well as through Elluminate, a desktop conferencing program. This event was scheduled as part of the monthly, day-long faculty and staff meeting for VCU. Faculty and staff, most of who had not participated in the weekly planning meetings and email exchanges, were invited to divide into groups and visit computer stations at which they were offered a guided tour of

how eCollege and Elluminate would be used to fulfill specific objectives and components of the familiar face-to-face residency in the online environment. In the discussion that followed the demonstrations individuals commented over and over how impressed they were with the work and design of the project.

Lessons Learned

The primary themes that emerged from the field notes, meeting minutes, interview notes and observations were (1) excitement and creativity, (2) pressure to boost enrollment, (3) attitudinal shift to accept an online option, (4) preservation of the residential model, (5) early and full involvement of key individuals and departments, and (6) adaptability to other areas of the university. The first three themes were the most often cited as key success factors.

Pointing to the excitement and creativity of the project, participants variously described these ideas. One faculty member said that the "ineffable component in all this is the part I'm labeling optimism, creativity, excitement" and that "working on this task force (or whatever we were) was really fun - exhilarating, creative, challenging - all the things you want your work to be. The group, as a whole, had a very optimistic outlook, which was really refreshing..." The dean said that the most important success factor was that "each virtual option task force member has been talking it up enthusiastically at every opportunity," which underscored the excitement and creativity involved in the process. Similarly, the Director of Lifelong Learning said that the project is "the most exciting thing I've worked on here in the past three years." She found the project to be great fun because it was collaborative, intellectually stimulating and engaging.

The pressure to boost enrollment was an unspoken mandate from the administration that permeated nearly all conversations and served as a pivotal force underlying and shaping the other success factors. This pressure was not only due to external competition from other online programs, but also from internal competition from another undergraduate program. As one senior faculty member said, "we knew we had to do it." Another consideration was that this new option not "cannibalize" enrollment in other options. Admissions counselors were quick to point out that they were turning away many prospects because of the residency requirement.

Enrollment pressure is related to the attitudinal shift to accept an online option in that this was one of several forces in play pushing faculty, staff and administrators to think differently about how to best serve learners at a distance. The Director of Lifelong Learning, a former faculty member and VCU director, said that the groundwork for this shift in thinking actually took place over ten years in which the program struggled to define itself in relation to adult and distance higher education and still retain its progressive identity. The conversation had been going on over years of faculty meetings and personal dialogues culminating in a February, 2004 faculty meeting when the online option was discussed for the first time without widespread dissention.

The attitudinal shift also took place amid evidence that online learning can be academically successful. One faculty member said this about her understanding of this shift, "I feel like I've been one of a very few voices in ADP for a long time saying that online interactions can be deep and meaningful and satisfying, but maybe as more and more people actually dabble in the online environment, that reality (because I do believe that online learning does not have to be second-rate) is easier to understand and accept." Likewise, the Director of Instructional Technology reiterated that "distance education" is understood in the popular consciousness as **online** education, and so faculty could no longer ignore the disconnect between their perceptions and what prospective learners desire and expect. Finally, one faculty member suggested that the charge of "unwillingness to change" was "leveled at Vermont College generally" and to counter this indictment faculty came to embrace new ideas about their program.

The preservation of the VCU residency structure was a key factor in winning over many of the faculty members and staff who were not directly involved in planning and project management. This success factor was suggested multiple times in weekly meetings, in email messages and following the September, 2004 demonstration. This factor was cited primarily because many initially resistant were concerned that the integrity of the model would be threatened to the detriment of the program. They were pleasantly surprised at the respect with which planners treated the need to include all

elements of the face-to-face residency. As the dean said, “there seemed to be a great sigh of relief that "their" program process is not going to be changed. There is also a belief that the Program may be forced to change in ways they would not condone, and the "virtual option" and the enrollment increase it promises might allow the Program to fend off such pressure to change.”

The preservation of the residency structure was also mentioned for at least two other reasons, unrelated to faculty fears about the model changing. One was that the tried-and-true aspects of the program served as the backbone to keep project participants on task as they recreated the residency in a virtual form. A faculty member said that the “well-thought-out and tested-through-practice features of the ADP residencies served as a sort of melody, and we could riff off of it from an online perspective, making it a very creative venture without changing the essential features of the program. Creativity is exciting, and excitement is catching.” In most corporate project management, new system creation is recognized as especially difficult; project participants in Virtual Vermont were able to avoid this difficult work since the unique academic program (system) itself was not changed – only the manner of delivery. Another stated reason by the dean for preservation of the residency structure was that this is the key to academic quality. “I think the demonstration has made it more widely known that Vermont College Undergrad does indeed have a very regimented planning and evaluation process that is key to academic quality.”

An additional factor was early and full involvement of key departments and individuals. Not only were all faculty invited to participate through weekly meetings and email conversation, but directors and staff participated as well. As one staff member said of the project’s process, “It’s important to feel like a valued partner in the process – that all voices were valued.” Bringing in all stakeholders into the process is also necessary to creating the buy-in needed to support the project, i.e., administrative computing, marketing, admissions, financial aid, business office, and registrar.

The final success factor was the option’s adaptability to other university programs. The broader implications for the rest of the institution, not only in terms of increased revenue, but for online options for the other nine programs were especially important to the administration. This factor was perhaps cited by the dean and directors more often than faculty members because their roles allow them to view their work in the larger context of the institution.

Not all of the lessons learned had to do with success factors, however. For example, because a feasibility study was not done as one of the first project management steps, problems that surfaced later were not identified early on. One such problem was that faculty teaching in the online option did not have their promised new laptops and software until shortly before the program start date. All development work had to be done with existing (often inferior) equipment. Had a feasibility study been done with Computer Services participating as a full partner, perhaps this would not have been a problem. Faculty made the best of the situation and drove to campus to complete development work. All lived within a forty-five minute drive to campus, with the exception of one who lives nearly three hours away.

Similarly, issues with Admissions led to problems meeting project enrollment figures. Had a feasibility study been conducted early on, with full participation of Admissions, these issues might have been avoided. Several months into the project, a consulting firm hired by the institution to assist in enrollment management became involved in planning. In part due to the restructuring recommended by this consulting firm, Admissions underwent a complete overhaul and was not prepared in the short time needed to handle the necessary ramp-up to quickly convert inquiries to enrollments. Because of staff turnover that led to six new staff out of ten positions, as well as training in new procedures, and integration of new lead generation companies, and despite evidence that a majority of inquiries said they want a non-residential option, still staff needed more experience to handle getting the enrollment needed to start the new option. Ultimately the dean decided to begin the Virtual Residency option with fewer than the optimal number of learners.

Conclusions

As John Dewey said in *Democracy and Education: An Introduction to the Philosophy of Education* (1916), “A progressive society

counts individual variations as precious since it finds in them the means of its own growth. Hence a democratic society must, in consistency with its ideal, allow for intellectual freedom and the play of diverse gifts and interests in its educational measures." VCU has been committed to the values of progressive education voiced by John Dewey since its inception at Goddard College (Goddard College, 2003). This case study found that the integrity of the model and its commitment to the Deweyan values of progressive education - which include democracy, freedom, individualized learning, and recognition of the unique needs of adult learners – was retained because of the key success factors identified in creating a Virtual Residency option.

Project participants believe that most of these success factors can replicated within the other programs at Union Institute & University. The pressure to boost enrollment exists across all programs as does the attitudinal shift to accept an online option. Perhaps if these departments can learn from the VCU experience, two other factors will be considered: preservation of the components of the residential model and early and full involvement of key individuals and departments (stakeholders). The most elusive and difficult to re-create of these factors, however, is the excitement and creativity. Much of the excitement came from the enthusiasm of key individuals who built trust and commitment to the project over months of work and in some cases years of working together. I can only hope that the enthusiasm is contagious.

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Chapter 13

An Instructional Design Model for Program Management: a case study of the implementation of an online post-degree certificate in special education

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Abstract: A reliable repertoire of effective practices for project management in newly developed e-learning courses and programs is increasingly in demand by project managers, content developers, instructional designers, program directors and policy decision makers. To address the need for replicable e-learning project management practices, the present case study examines the implementation of a post graduate certificate program in special education undertaken at the University of Saskatchewan, and funded through the provincial government's Technology Enhanced Learning (TEL) initiative, a pan-institution partnership. The case study examines some of the issues that arose in the collaborative development of the of the certificate and presents an integrated model for the implementation of e-learning programs adapted from Greer's (1992) project management model for instructional development. The case study, from a project management perspective, presents lessons learned from the program's implementation providing information for reflection on how adaptations and modifications affected program development and how these short-cycle decisions provide a model of effective practices for future e-learning project management initiatives.

Key words: Special education, technology enhanced learning, teacher preparation, program development

Over the past few years there has been a marked increase in enrollment among students in online courses, with the growth rate of online learning outpacing traditional face-to-face instruction or other technology-enhanced modes of learning (Allan & Seaman, 2004). The increased demand for online learning has been facilitated by its ability to provide accessible, affordable, and flexible learning environments. Online learning allows the student the opportunity to access their course at any time and any place, providing those who live in rural and remote areas with the opportunity to advance their education that otherwise might be encumbered by a lack of post-secondary institutional resources to facilitate traditional face-to-face learning (Downes, 2002). Today, many post-secondary institutions believe that their continued success to attract and graduate students will hinge on their ability to provide quality online learning environments (Allan & Seaman, 2004).

Coupled with the demand for online learning, then, is the need to develop quality technology enhanced learning environments. In the past, criticisms of online learning have been levied because of its inability to enhance learning outcomes as based on student satisfaction, when compared to traditional face-to-face

instruction (Johnson, Aragon, Shaik, Palma-Rivas, 2000). Questions pertaining to the quality of access, the ability of students to use and embrace the new technology, the need for technical support, and how best to provide asynchronous communication, have dogged early online instructional efforts (Phipps & Merisotis, 1999). Although this trend appears to be in decline, with increasing rates of student satisfaction reported for online learning (Allan & Seaman, 2004), some of the criticisms still linger. Consequently, there is a heightened sense of urgency among project managers, content developers, instructional designers, program directors, and policy decision makers for the development of quality online learning courses.

Previous attempts to articulate best practices for online development drew from traditional instructional design, distance education, and adult education models (Cervo & Wilson, 1994). However, these models are lacking as they neglect to incorporate the nuances unique to online instructional design and project management. As the development of online programs involves a number of interdisciplinary partnerships, a reliable repertoire of effective practices for project management in newly developed online courses and programs is required. To address the need for replicable online project management practices, the present case study examines the implementation of an online thirty-credit unit, nine course post graduate certificate program in special education undertaken at the University of Saskatchewan and funded through the provincial government's Technology Enhanced Learning (TEL) initiative, a pan-institutional partnership.

All courses funded through TEL were required to use a team made up of representatives from the Department of Educational Psychology and Special Education, the Instructional Design Group of the Extension Division, the Department of Media and Technology, and Information Technology Services. The case study examines some of the issues that arose in the collaborative development of the certificate and presents an integrated model for the implementation of online programs adapted from Greer's (1992) project management model for instructional development. The case study, from a project management perspective, presents lessons learned from the program's implementation providing information for reflection on how adaptations and modifications have affected program development, and how these short-cycle decisions provide a model of effective practices for future online learning project management initiatives.

Background

Prior to the establishment of the Post Degree Certificate in Special Education, a thirty credit hour face-to-face Postgraduate Diploma in Special Education had been offered by the Department of Educational Psychology and Special Education at the University of Saskatchewan. The vast majority of practising teachers enrolling in the Postgraduate Diploma in Special Education had done so on a part-time basis. Concerns with the lack of research intensiveness of the postgraduate diploma led to a recommendation by external reviewers of the graduate program that the department phase out the Postgraduate Diploma in Special Education in favour of a fifth year of undergraduate specialization. This move was strongly supported by Saskatchewan Learning, who noted that the University of Saskatchewan graduate requirement for certification limited enrolment in the program at a time when there is increasing demand for special education teachers in Saskatchewan.

The preparation of teachers for students who require special education support is mandated in Saskatchewan's *Education Act*. The Department of Educational Psychology and Special Education has the task of providing Saskatchewan with a sufficient supply of teachers trained in special education. The Post Degree Certificate in Special Education was developed in response to requests by the University and stakeholders that special education teacher preparation become more accessible through remote and distance offerings. Accessibility to the program has been greatly enhanced with the Department of Educational Psychology and Special Education receiving Technology Enhanced Learning funding for online development of the program using the WebCT platform. As a result, the Department of Educational Psychology and Special Education offers the only online Post-Degree Certificate in Special Education in the province of Saskatchewan and produces most of the professionals in special education who fulfill Saskatchewan Learning's qualification requirements. Furthermore, the certificate is well situated within a national and regional context, as one of the few online distance education programs in special education being offered in Canada.

Need for the Program
Demographics of members of the Saskatchewan Teachers Federation suggest that there is an ageing teaching force in the Province of Saskatchewan. It has been predicted that between twenty five and thirty percent of teachers will retire over the next four to five years. This statistic, coupled with Saskatchewan Learning data showing a current shortage of credentialed special education teachers (Saskatchewan Learning, 2001). This has led Saskatchewan Learning and the Saskatchewan Teachers Federation to argue for greater accessibility to and flexibility within programs leading to special education teacher certification. Both organizations have articulated strong support for the establishment of a Post Degree Certificate in Special Education. By locating the program within an online undergraduate framework, it is anticipated that more students will meet program eligibility requirements. In addition, improved online accessibility will more readily accommodate part-time students who are working.

Demand for the Program
The Saskatchewan Learning (2001) report, *Educator Supply and Demand in Saskatchewan to the Year 2006*, highlighted difficulties in the recruitment and retention of special education teachers, among other problem areas. This report led Saskatchewan Learning to establish Teacher Recruitment and Retention Initiatives, where Individual Program Bursaries, Full-time and Part-time, Pre-service Bursaries, and Teacher Education/ Cohort Programs have been funded to encourage teachers to become trained in targeted areas such as special education. As individuals and school boards respond to this initiative, increasing demand for the proposed Post-Degree Certificate in Special Education is expected. As well, an ageing teaching population further suggests an ongoing heavy demand for credentialed special education teachers.

More specific data to support the demand for this program stems from a recent Educational Psychology and Special Education departmental survey where employer perceptions regarding future needs of their organization for special education teachers were evaluated. Responses by employers indicated a high continuing need for special education personnel in the future. In a follow-up telephone interview, employers commented on the ongoing difficulty of attracting and keeping graduates in the largely rural areas of the province. In addition, findings from a departmental survey of former students showed that the vast majority are employed within a school division. A subsequent review of students exiting the program over the past five years found a 100 percent employment level for former students. Thus, graduates appear to be fully employed and working directly in the field of program preparation. These data suggest a high and continuing demand for graduates meeting provincial special education certification.

Program Description
International standards for the preparation of professional practices for special education teachers has been established by the Council for Exceptional Children (CEC), the largest international professional organization dedicated to improving educational outcomes for individuals with exceptionalities. The knowledge and skill standards set for professional practice by the CEC were used as benchmarks for the content structure of the certificate that has been organized around the four levels of knowledge base, application, integration, and extension.

The first five three-credit unit courses comprise the knowledge base level and include content pertaining to the history and philosophy of special education, and the high incidence exceptionalities relating to speech and language, learning disabilities, and behaviour. The fifth course in this area pertains to collaborative interdisciplinary teamwork as a common feature and evolving practice in special education.

The application level prescribes the designing and provision of supports to students with exceptionalities. The pairing of assessment with instruction in a full six-credit unit course that is integrated with the practicum course comprises the application component. The first half of the assessment and instruction course enables students to learn and practice their assessment and instructional planning skills that prepare them for the practicum that they take concurrently during the second half of the academic year. This alignment of courses at the application level enables students to practice their assessment skills while designing individual student programs in a school based guided practicum.

The final course in the certificate serves as an opportunity for students to synthesize content and experiences obtained in the other certificate courses. As the final class in the certificate, the central goal of the individual project course is to prepare the student as a "reflective practitioner" (Schon, 1989). Students, with the support of the instructor, are guided in investigating a topic of personal interest in the field of special education. The aim is to prepare students to conduct a review of the literature, develop a set of effective practices related to their topic, and prepare an online presentation of their topic. By doing this, an online repository of effective practices for special education teachers is created that can then be accessed by special education professionals to enhance the learning outcomes of students with exceptionalities.

Program Content Development

In the spring of 2001, Saskatchewan Learning, in conjunction with Saskatchewan's post-secondary institutions and the Campus Saskatchewan partnership, initiated the first round of TEL development funding to enhance the quality of and extend access to learning opportunities in rural, urban, and First Nation communities across the province through effective use of networked computer technology.

Content development of the certificate followed a four-phase implementation plan (see Figure 1). This plan was set in action by the University Council's approval of the Post Degree Certificate in Special Education as an academic program in the spring of 2003. To ensure a seamless mode of delivery to professionals wishing to be trained in special education and to uphold quality standards in program development, an implementation plan was created that saw initial content development and instruction occur in a traditional face-to-face setting. The online development of the certificate was facilitated by TEL development funding for the 2003-04, 2004-05, and 2005-06 fiscal years,

A faculty member who was program director and principal content developer for the certificate was responsible for procuring and administrating multi-year funding for the project and oversaw the content development. Subject matter experts (SMEs) were recruited by the program director and had the opportunity to develop content for the certificate courses using traditional face-to-face delivery methods. This type of approach was beneficial to the SMEs as it allowed them the opportunity to pilot and refine content applicable to the course that they were developing. During the period that face-to-face delivery of the courses occurred, SMEs met with the project management team to tailor the content they were delivering to an online format.

The second phase saw the beginnings of the instructional design process. At this juncture TEL development funding was received for the first five courses of the certificate. As a result, a twelve-month developmental timeline was created whereby content, based on the face-to-face teaching of the courses, was adapted for the online format. The third phase coincided with the second round of TEL development funding, which saw revisions for the first five courses developed along with online content development for the remaining four courses. The fourth phase of development saw revisions to remaining courses, the establishment of problem-based learning exercise across courses, and the online development of the two prerequisite courses that had been delivered face-to face previously prior to the launching of the certificate.

Program Development Management

All courses funded through the office of Technology Enhanced Learning were required to use a decentralized project management approach (Bates, 2000) with representatives from the Department of Educational Psychology and Special Education, the Instructional Design Group of the Extension Division, the Department of Media and Technology, and Information Technology Services. Each unit received funding for their participation in the project upfront. In order to improve the development process for these courses, several project management steps were implemented at the university level, including a course development process that outlined roles and responsibilities for project design and development.

Because the Special Education Certificate was unique in that an entire program was being developed, the Department of Educational Psychology and Special Education appointed a tenure track professor to oversee development and delivery. Subsequently, the instructional designer acted as project manager while the faculty member acted as program director overseeing content development. The result was a team approach to managing the project based on each individual's area of expertise.

Phase One →	*Phase Two* →	*Phase Three* →	*Phase Four*
2003	2003-2004	2004-2005	2005-2006
Face to Face → Content Development EDPSE 500;510; 520; 530; & 540.	Online Development → .	Revisions & Maintenance	
	Face-to-Face → Content Development EDPSE 550.6 560; & 570.	Online Development →	Revisions & Maintenance Online Development Perquisites (pending) EDPSE 390 & 414

Figure 1. Development Timeline

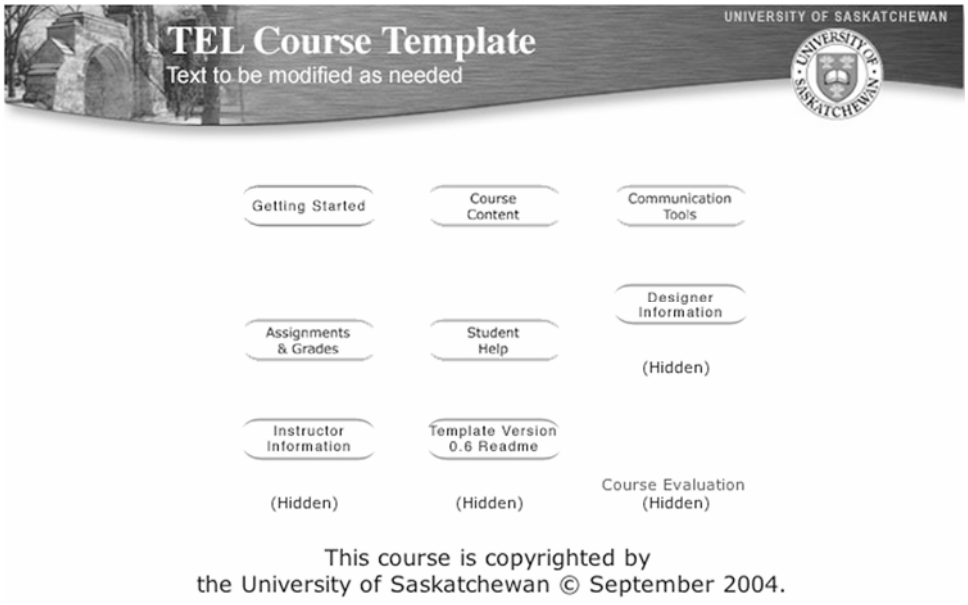

Figure 2. TEL Course Template

Instructional Design Phase

Instructional design took place at the following three levels during the development of the program: (1) university standards; (2) program; and (3) course.

University standards

A WebCT course template, print-based materials templates, and accessibility standards for students with disabilities were created for all university online courses. This standardization of key elements served as a starting point for the instructional design of the Special Education Certificate. Using the TEL template ensured that all students would encounter a similar structure when using WebCT and reduced the need for students to relearn how to use material and navigation in each course (see Figure 2).

Program instructional design

Early in the development of the program, the Department of Educational Psychology and Special Education decided that all courses would be similar in look and feel, be highly collaborative, and provide an opportunity for the development of complex thinking skills. One of the first design decisions that needed to be made was how content would be presented within the WebCT environment. Conversations between the program director, project manager (instructional designer) and subject matter experts led to the decision that content would be organized into themes. Each theme would contain outcomes-based objectives; an image that represented the overall tone of the theme; and a list of learning activities and assessment tools students might use to learn about that theme. All of this information would be contained on one web page with links to readings, audiovisual resources, and URL's that opened as popup pages (see Figure 3). This ensured that students always returned to the activity page that outlined what they needed to know for that theme. The students were then able to advance to the following theme by clicking on the Next button in WebCT.

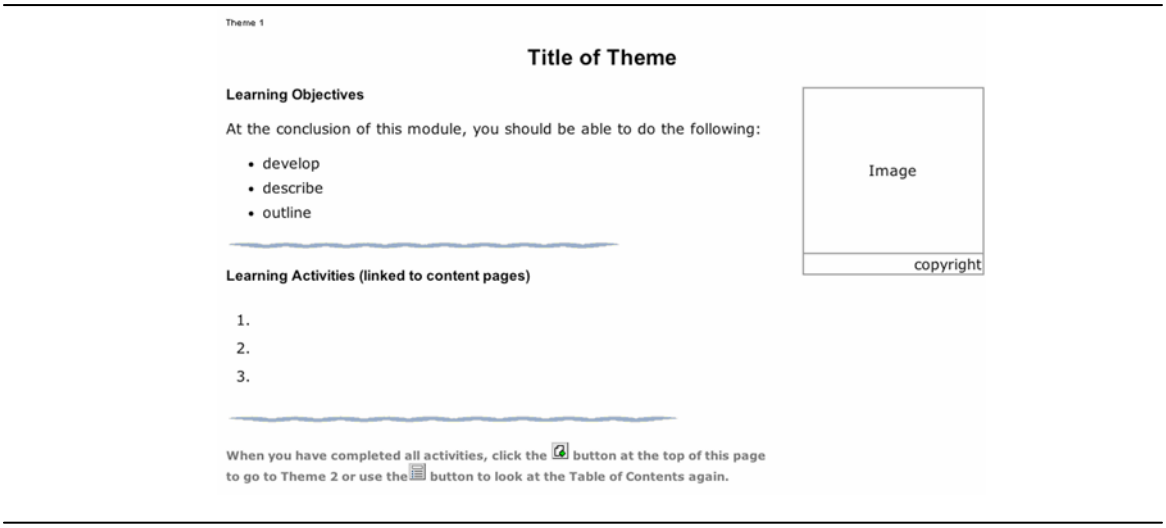

Figure 3. Course Theme Page

The needs analysis conducted by the Department of Educational Psychology and Special Education identified the ability to collaborate with peers, parents, and outside agencies as a core skill of special education teachers. All courses would therefore require students to collaborate in the writing of a marked assignment. The nature of the assignment would vary from course to course, with some courses requiring more than one collaborative assignment. Students in each course would then be assigned to private WebCT discussion groups where they could work on their individual group projects. Students were also encouraged to use the chat area to discuss generic issues relevant to the completion of the assignments, themes, and readings.

The ability to use complex thinking (defined by Jonassen (2000) as integrating creative, critical and information-based thinking) within an online environment was another skill required by special education teachers. This skill was important for the application and integration phases of certificate course content. Students needed to be able to apply these skills both collaboratively and individually in the management of complex learning environments.

To facilitate the development of this skill, problem-based scenarios were included in certificate courses with the scenarios becoming increasingly difficult with each course. A school-based practicum experience as the next to last course would provide a further concrete opportunity to improve students' skills in this area. This component of online content development mirrored the application and integration phases of the certificate, as delineated by the Department of Educational Psychology and Special Education in the certificate proposal and originally implemented in the face-to-face offerings.

Course-level instructional design

Eight three-credit (one semester) and one six-credit (two semester) courses make up the certificate program. Online design and development took place in three sections: five courses completed in the first year (2003-2004), four in the second (2004-2005), and the two prerequisites in the third year (2005-2006). Courses were to be delivered in the next academic term immediately after online development was completed. As a result, online content development timelines had to be rigorously adhered to if commitments for delivery were to be fulfilled.

Allotted time for course development varied between three to six months. Delays in the development of one course would seriously affect the development of later courses. The program director, in the role of principal content developer for the certificate, was responsible for the recruitment of SMEs. Careful consideration was given to selection of the SMEs from professional bodies in the province involved in the delivery of special education services. Experts from special education stakeholder groups, including Saskatchewan Learning, the public and Catholic school divisions, and the Council for Exceptional Children, were approached to insure quality development and enhance credibility among those involved in provision of services to students with exceptionalities.

To facilitate the expeditious development of the certificate, the project manager and program director met with each SME and created a contract that delineated three content development milestones. The content development milestones included: 1) an initial design phase; 2) half the course content; and 3) complete course development, including revisions. Upon conclusion of each milestone, the SME was paid a third of their contracted fee for development of the program. By establishing a contractual arrangement with the SMEs, a formalized process for content delivery was established. Print and audiovisual resources for content development were provided by the program director and SMEs met on an informal basis with the program director to obtain feedback on the content being developed. This in turn facilitated the timely delivery of content for online development of the courses in the certificate.

The instructional design planning document incorporated the key features of the TEL development template for online courses. The planning document included a list of team members and contact information; an outline of the course organization; resources to be used (including textbooks, multimedia, WebCT); a course assessment plan; dates for completion and delivery to students; and a budget. In addition, the planning document

incorporated course objectives and learning activities into the template items that were not part of the original TEL template. The instructional design planning document was completed within the first month of course design by the SME and instructional designer/project manager and forwarded to the program director for content approval.

Completing this document usually required 1 to 3 face-to-face meetings, depending on how familiar the SME was with the design of online learning. The instructional designer was responsible for ensuring that learning activities and assessment matched both the course objectives and the learning needs of online students. The instructional design phase was revisited several times during the development of course materials to ensure a goodness of fit with online development and course objectives from the Department of Educational Psychology and Special Education.

One of the challenges that arose during this process was the lack of familiarity with online learning among SMEs. The university's Information Technology Services provided regular training on use of WebCT tools to develop online courses, but SMEs were unable to enroll in the training because courses typically occurred during the day when the SME was often working. Courses on teaching in an online environment were rarely offered and were always face-to-face. Training the SMEs in the development and instruction of online learning using WebCT became the responsibility of the instructional designer, which used up design time and revolved around specific design problems. The university is currently addressing this issue and has begun to develop training modules for online learning using WebCT.

Course development

Upon completion of the initial instructional design, the development team met to discuss content development. The feasibility of timelines and budget were closely scrutinized at this stage. Course development for the certificate was divided along the following lines, following organizational structures at the university:

- SMEs wrote mini lectures and descriptions of assessments for course themes. They identified course-reading materials that would be included as either online resources or in printed readings packages.
- Instructional Design Group cleared written copyright, professionally edited content, created readings packages, created HTML pages and uploaded content into WebCT.
- Division of Media and Technology created audiovisual resources such as audio-based web pages, images, video, cleared copyright on audiovisual material created outside the university and reproduced CD's, video and DVD required by the students.
- Information Technology Services created the databases used for online courses.

Program Delivery

With the completion of the online development of the first five courses in the certificate, a pilot online offering was provided to students. The first online pilot course was delivered in September of 2003, the second in January 2004, and the third, fourth and fifth were delivered during spring and summer sessions of 2004. To date, 200 students have enrolled in the certificate courses offered online, with fourteen withdrawing for a ninety-four percent retention rate (see Table 1). With the development of the remaining courses in the certificate for the 2005/06 regular session, enrollment projections are expected to double, if not triple in upcoming years. Thus, online courses in special education continue to provide accessible, affordable, and flexible learning environments for distance education students as evidenced by the increasing enrollment statistics.

Table 1

Term	Class	Students Completed	Students Withdrawn	Students Incomplete
T1 2003	EDPSE 500	24	1	0
T2 2004	EDPSE 510	22	1	0
T3 2004	EDPSE 520	21	2	0
T3 2004	EDPSE 530	24	2	0
T3 2004	EDPSE 540	15	0	0
T1 2004	EDPSE 500	28	2	0
T2 2005	EDPSE 500	16	2	0
T2 2005	EDPSE 510	28	0	0
T2 2005	EDPSE 520	22	2	0
Total		200	12	0

During the course pilot, the instructional designer acted as a support person for both the instructor and the students in order to identify ongoing issues that instructors and students would have. Information Technology Services provided courses for the instructors on how to use WebCT course delivery tools and provided a helpdesk system for technical questions. As SMEs are special education professionals employed outside of a university setting, accessibility to the daytime course delivery workshops proved problematic.

Students enrolled in the program come with varying computer literacy skills. Beginning teachers with less than five years experience and those with several years experience comprise the major demographic of the learners in the program. Surprisingly, not all enrolled in the program had the requisite computer literacy skills required for most word processing programs. Moreover, some had a steeper learning curve when it came to adapting and functioning within an online learning environment. Consequently, a mini orientation on WebCT was created online that would show up one month before the course start date. The regular content would replace this mini course on the official start date.

Student responses to this mini course have been quite favorable and students seem to have fewer technical problems. Although we have not had time to formally assess if this observation is accurate, it is our contention that some students who lack basic computer literacy skills would still benefit from a more intensive face-to-face orientation. However, how to offer such orientation in an accessible manner when many of the students enrolled reside in rural or remote areas, as is common for distance education, still needs to be resolved.

Effective Practices for Implementation and Project Management

To help conceptualize effective practices relevant to the development, implementation, and instructional design of a post-secondary online program, a visual model is depicted below. The model is based on Greer's (1992) project management for instructional design, but also blends structural components relating to the process of implementation for online programs.

What differentiates the present model from Greer's work are nuances specific to the implementation process of a newly developed program that are integrated within an instructional design project management framework. As illustrated in Figure 4, the seven-phase process for program implementation includes: program implementation planning; program content development; program development management structure; program instructional design; program implementation; program revisions and maintenance; and program stabilization. Within each phase are actions for effective practices and the resulting impact of such actions on the program. From an implementation perspective, the practices articulated are based on what we deemed most important to the development of an online program.

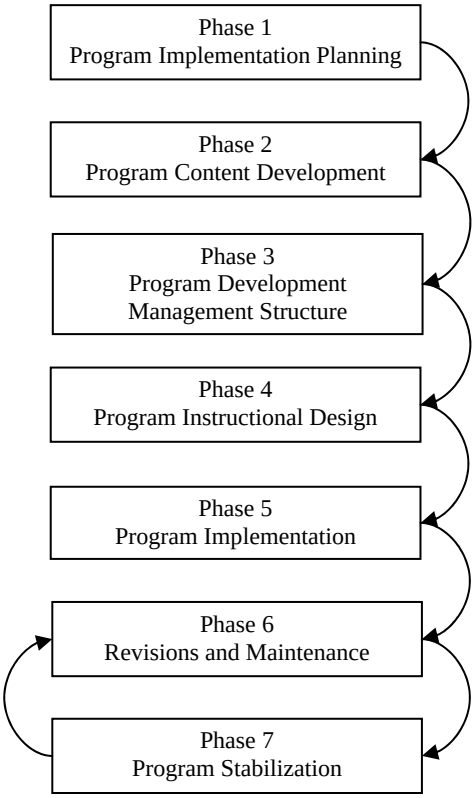

Figure 4. An Instructional Design Model for Program Implementation and Program Management

The first phase of the model pertains to program implementation planning. Salient features of this phase relate to the undertaking of a needs assessment and the formal involvement of stakeholders in the implementation planning process. The purpose behind a needs assessment is to identify stakeholder requirements and how those needs can be met. Stakeholders in this instance refer to those professionals or organizations from which community based support is derived and input requested surrounding the content and purpose of a specific program.

As the first phase of online program implementation, the identification of stakeholders and their formal involvement in the governance structure of a newly planned program through an advisory council is viewed as essential if partnerships are to be established. From a program management perspective this is important because it begins to formalize some of the existing informal linkages that might have already developed to accommodate service delivery. This phase is characterized by public relations initiatives that inform community members and professionals alike regarding the efficacy of a particular program. Program directors promoting online learning need to have highly developed communication skills as public education seminars and cultivation of stakeholder allies who would advocate for the program's implementation are viewed as essential and necessary to creating community readiness for a newly developed online program. Shea-Schultz and Fogarty (2002) argue that stakeholder involvement is key to achieving buy-in for newly developed online learning initiatives. Making the business case for online learning requires outlining the benefits to key stakeholders that includes the need, cost effectiveness, accessibility, and flexibility of online learning environments. Moreover, by actively involving stakeholders in the governance structure through an advisory council ensures that they will have a voice in the creation of a newly developed online learning environment and be supportive of its implementation.

The second phase of the model relates to program content development. In this phase the initial content model is developed. Program content development is derived from input provided by the needs assessment and stakeholders. In turn, as content is developed feedback to stakeholders can be provided, thereby ensuring their involvement in the process. Our experiences led us to believe that content first delivered in a face-to-face format is more easily developed for online learning. This is in part because the SMEs recruited to develop the online content had the opportunity to develop and experiment with the content in a more traditional manner of delivery. Consequently, some of the issues pertaining to the structure and flow of content delivery are addressed and revisions to the original content model are more easily facilitated by the SMEs, who now have experience in its delivery.

The program content development phase should see the initial formation of the content development team that includes all SMEs involved in content development, the program director, and project manager. Team meetings facilitated by the program director and project manager are held whereby a timeline for face-to-face delivery and online development are presented. Collaborative consultation should characterize the team meetings with topical discussion surrounding the sequencing of deliverables, thereby ensuring a more even and informed approach surrounding content development of the program.

The third phase of the model involves the establishment of the program development management structure. In this phase, the real job of the project manager begins. A project management team is established based on required resources for the program in question. In our case, the project management team included representatives from the Instructional Design group, Information Technology Services, and the Division of Media and Technology. The project manager and program director outline the scope, sequence, roles, responsibilities, and budget allocations for the project management team. A timeline for development is discussed, as are the means to enhance both vertical and horizontal communication through regular meetings of the project management team. At these meetings status reports pertaining to program development are presented.

Phase four of the model is concerned with program instructional design. This phase of the model is characterized by team meetings with the SMEs regarding online content development. If SMEs have had the opportunity to deliver the program to be developed for online learning in a face-to-face format then the transition to online content development is easily facilitated.

During this phase, a format for online content development is established. This provides a consistent look and feel for the online platform being used (in our case WebCT) across courses in the program. Critical to this phase is the need for training of the SMEs in online content development. It is advisable that in large post-secondary learning organizations that an accessible training session on the use of tools and instructional methods common to the online platform be provided. Depending on workload this can be accomplished by the instructional designer. However, in most cases the instructional designer is involved in the development of other online courses and programs, so it is recommended that a training centre be established that would provide this training to the SMEs.

Once this has occurred, the SMEs can then meet on an individual basis with the program director and project manager to draft a contract and establish milestones for the deliverables of all content. The SMEs are responsible for the development of content themes, in consultation with the program director, who should then provide academic advice and resources for their use. By contracting the SMEs, and establishing milestones for deliverables tied into a payment schedule, the timely delivery of thematic content is ensured. The project manager would then draft the instructional design document that outlines specifics relating to course description, pre and co-requisites, credit hours, student assessment, project team members, learning resources, and themes. The project manager (instructional designer) then works individually with the SMEs towards the online development of the themes for a specific course. Depending on the resources required to develop the course, the project manager/instructional designer will consult with other members of the project management team for purposes of integrating audio, visual, or print resources.

Program implementation characterizes the fifth phase of the model and involves the piloting of a particular course or program. At the implementation phase, it is imperative that all SMEs who have delivered the course face-to-face and have developed online content now have the opportunity to pilot the online version. Having received training in the use of the online platform, the SMEs now have the opportunity to work through the implementation of the course. This is imperative for the revisions and maintenance phase, as the knowledge and experiences garnered will aid in further development of the course or program.

For students enrolled in online courses, opportunities are made available for either face-to-face or online training in the use of the online learning platform. Students should also have requisite knowledge of relevant computer technologies. The ability to use the Internet, navigate web pages, send email, send attachments, and understand the rudiments of word processing programs is essential if the individual is to succeed in online learning. Our experiences found that those enrolling in the certificate came to the program with a wide variety of degrees of competence in the use of computer technologies. Consequently, not only is training in the use of the WebCT platform necessary, but also an introductory primer to basic word processing skills is required in some cases.

Moreover, research surrounding web-based instruction has demonstrated that students who lacked confidence in their Internet skills, and those who did not have the proper tools or access to the appropriate computer technologies, tended to dislike online learning (Thompson & Lynch, 2003). This was supported by the informal feedback we received from both instructors and students. To address this issue, research surrounding the psychological processes underlying web-based instruction is being formulated, using students enrolled in future certificate courses as subjects.

The establishment of feedback linkages to the funding agency and other stakeholders also characterizes the program implementation phase. Every effort is made to monitor program implementation, so that challenges to the process of implementation are addressed. The fidelity of the program to the model and characteristics of the implementation process will then guide further evaluation efforts. Specifically, results from departmental course and instructor evaluations of the online courses lead to decisions regarding the revision and maintenance of particular courses in the certificate as delineated in Phase 6 of the model, revisions and maintenance. To facilitate the revision and maintenance of online courses, a portion of revenue generated from the course offerings is set aside for the revising and maintaining of course content. Optimally, this would lead to short cycle decisions that would better inform program implementation and lead to program stabilization, Phase 7. Given the model presented, a feedback loop between Phase 6, revisions and maintenance, and Phase 7, program stabilization, is depicted indicative of the necessity for the revising and maintaining of online program content that ultimately leads to program stabilization.

Conclusion

The collaborative design and implementation of online courses is a multifaceted process. This is especially true if a whole program is to be launched, as opposed to an individual course. The model presented for replicable online learning practices is based on our experiences in developing the Post Degree Certificate in Special Education as illustrated in the present case study. We believe the model developed represents best practices for newly developed online learning programs at the post-secondary level. Although research pertaining to effective practices for program management for online courses has been published, the present model is unique because it captures nuances specific to the implementation process. It has been our experience that collaborative consultation and the establishment of interdisciplinary partnerships require a clear delineation of the scope and sequence of a project and the ensuing roles and responsibilities formulated for the project design team.

The unique funding arrangement, provided by the Technology Enhanced Learning initiative and managed through Campus Saskatchewan and the various partner institutions, belies the need for a team approach to online development. Because of this, it is important that both vertical and horizontal channels for communication and feedback be established and a mechanism for resolving conflicts is established. Fortuitously, many of the issues that arose in the development of the certificate

were mainly logistical in nature and easily resolved through team meetings. As a result, a quality product was delivered on budget and on time, facilitating a seamless mode of service delivery for the training of special education personal. Now that the certificate has been developed, the current task is to explore avenues of future research that will further contribute to an understanding of how online learning contributes to lifelong learning, empowered professionals, and the well-being of individuals with exceptionalities.

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Chapter 14

Managing online learning projects at a distance: A case of workplace training

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Abstract: Project management is a feature of all complex multi-faceted human activities. It can be done in professional, formal ways with plans and timelines, or it can proceed (and all too often does) in a more ad hoc, informal way. As education increases in complexity with the integration of information and communication technologies (ICTs), and improved accessibility through education 'projects' (e.g., new programs, collaborative implementations, large scale entities like competency-based curricula now need sound project management practices in order to be successful.

Management of projects where team members interact face-to-face is challenging; however, management of projects where team members are located in different geographic locations is much more challenging. This chapter outlines a large-scale elearning project involving twelve organizations in a six month implementation of an innovative program for workplace training. Starting out as an informal, loosely structured set of activities, overwhelming interest in the project caused it to grow to a size that required more serious planning and organization.

Key words: online learning projects, project management, workplace learning

Creation of new curricula for workplace training often proceeds directly from design to classroom, without alpha and beta testing and careful evaluation. In the case of elearning, defined as the use of technological intervention to provide flexibility for, and maximum accessibility to, educational experiences, online delivery is still new enough that testing becomes even more important. Testing was a major issue for the project outlined in this chapter, as it was breaking new ground on another front; the content for the training was customer service in distance or technologically mediated service environments. In this context, customers are contacted and served via telephone and web-based support. Sales processes, disseminating product knowledge, trouble shooting customer complaints and responding to any kind of customer enquiry must occur without the benefit of face-to-face interaction. Appropriate communication processes that are strictly voice and text based have to developed and taught – in this case at a distance.

In addition to the innovative side of the project - facing the challenges of being in uncharted waters without models to follow, the administration of the project was carried out at a distance, requiring the use of the same processes and communication skills we were preparing to teach. We needed the skills of a project manager, for example, to provide exemplary listening skills, give validating feedback, follow-up appropriately and on time with those involved, and deliver what we said we would do. This provided for a unique opportunity to manage a project, with appropriate and known project management tools, without the requirement, or the opportunity, for face-to-face engagement. All project management processes occurred through the

support of Information and Computer Technologies (ICT) – at a distance.

The inception of the project was sparked by a demonstrated need in the Canadian workplace. Findings from Human Resources and Skills Development Canada (HRSDC) identified that call center employees must be able to handle the technological aspects of their job as well as customer service requirements in an appropriate manner, using good "soft skills". According to MacLeod (2000), soft skills are identified by self-awareness, analytical thinking, leadership skills, team-building skills, flexibility, the ability to communicate effectively, creativity, problem-solving skills, listening skills, diplomacy and change-readiness.

Learning in this content area includes both the cognitive and affective domains (Krathwohl, Bloom & Masia, 1964) . There is evidence of the effectiveness of elearning relative to cognitive outcomes (Garrison & Anderson, 2001), but little regarding affective outcomes. Employees lacking soft skills need training, but, most soft skills training uses traditional, classroom based delivery where employees must be in the same location at the same time. This delivery is inconvenient and not very efficient for most organizations. The project described in this case study ultimately contributed to organizational effectiveness by investigating how soft skills training can be delivered to the workplace using broadband technology. Employees accessed the training materials and obtained virtual support using a broadband network.

Elearning uses synchronous and asynchronous communication technologies to deliver content (Conference Board of Canada, 2001) and create support for learners through computer-mediated conferencing. This project used elearning strategies to deliver training on soft skills to helpdesk staff so that they could function more effectively in their roles. Soft skills are critical for helpdesk staff as they work exclusively with customers in a technologically mediated environment. According to Goleman (1995), employees with appropriate soft skills demonstrate increased productivity. Providing soft skills training to employees in the workplace often results in more satisfied employees and customers, leading to higher productivity and, ultimately, competitive advantage.

Effective project management created the opportunity to design and test an appropriate elearning intervention. While the project did not start with formal documented planning, the rapid growth of the project required that the most import aspects of project management be implemented. The project management process we used, and how successful the process was is outlined in this chapter.

Project Objectives

Project objectives spanned five stakeholder groups, with some objectives shared with multiple groups and some objectives unique to a single group. The first group was the researchers, who also acted as the training facilitators and project managers. The second group was the professional associations acting as advocates for the project in support of membership training. Third were the senior executives from member organizations, acting as key decision makers in allowing staff to participate in the project. The fourth group was the middle managers; those managing the day-to-day operations of the call centers. The fifth group was the front line workers, recipients of the training and the holders of the ultimate deliverable: improved service as reported by customers.

Stakeholders	*Researchers/ Project Managers*	*Professional Associations*	*Senior Executives*	*Middle Managers*	*Front Line Workers*
Objectives	▪ Engage enough organizations to get valid research results ▪ Gain cooperation and support from all organizations ▪ Stay within available resources ▪ Ensure efficient and effective project roll-out ▪ Provide exemplary training ▪ Generate valid and valuable research findings	▪ Support member organizations through valuable opportunities ▪ Provide access to membership without intrusion ▪ Be involved with a valuable project ▪ Monitor for delivery of stated objectives	▪ Improve service to customers ▪ Realize effective training for staff ▪ Realize as little cost in terms of time and energy as possible	▪ Realize effective training for staff ▪ Increase employee satisfaction ▪ Improve service to customers ▪ Realize as little cost in terms of time and energy as possible	▪ Receive valuable training ▪ Create efficiencies in work processes ▪ Improve service to customers

Chart 1. Stakeholder objectives

Managing the Project

Elearning material development in organizations requires instructional development and project management, both highly technical skill sets. Both activities require development plans that are complex, expensive, and which often take a long time to complete. Most elearning projects are undertaken to develop learning materials; however, some projects may be initiated to establish support systems for learners or to prepare for the delivery of learning materials. Some projects may involve collaboration between organizations, which calls for good project management to ensure successful completion of the projects. In the current case, all the above were required.

This type of project is difficult to manage because of the number of team members involved and the multidisciplinary background of the team. Projects of this genre normally involve several team members performing interrelated activities, coordinated by a project manager to make sure there is effective use of resources to complete the project in an efficient and timely manner. A typical elearning development team includes a project manager, instructional designer, content experts, editor, technical experts and a steering committee. In projects like this one, members of the development team are often in different locations and time zones. The challenge for the project manager is how to manage using a virtual team with members at a distance.

The following activities guided our elearning project, assisted the identification of deliverables, and were used to guide the project management function:

Stakeholder objectives are identified, clarified and agreed upon, for the duration of the project

We approached professional associations and requested their cooperation recruiting organizations with call centers and help desks. This created the first layer of stakeholders - professional organizations in the call center/helpdesk industry. Their requirements were a polished, non-intrusive approach to member organizations, an effective and efficient project and the realization of stated deliverables. An advertisement regarding the project was sent through professional association e-mail lists and newsletters. The advertisement stated the scope and nature of the elearning project, participant obligations at the organization level and the level of the individual learners. Interested organizations were invited to contact the project manager for more information.

The response was overwhelming. Many organizations jumped at the opportunity for inexpensive training in the area of soft skill development. Like the professional associations,

they expected the least amount of disruption as possible, an effective and efficient project, and the realization of stated deliverables. Learning objectives identified for the training as follows.

The learners will engage in and/or be able to:

- Review the scope and nature of short-term customer/call center consultant personal relationships
- Facilitate the identification of customer expectations and desired outcomes
- Present a customer service model that supports the call center consultant call process
- Document the essential components of the call process in the call center environment
- Learn and apply basic skills of human interaction at a high level of competence
- Strengthen customer/call center consultant personal relationships and customer satisfaction with the services provided
- Strengthen relationships among call center staff
- Identify the meaning of values/belief systems and their effect on human relationships
- Understand the need for awareness and sensitivity to human diversity
- Integrate human relationship skills within the call process
- Review the problem solving process and learn to apply the collaborative process that makes this work
- Review the nature of conflict and the role of call center personnel in a conflict situation

We agreed that training objectives would be delivered at the learners' sites via computer-mediated courses over the Internet, with high levels of flexibility for, and engagement with, the participants. At the end of the training program, participants would receive certificates of completion for this customer service program.

Organizations were required to agree to the project's terms of reference. Letters of understanding were signed, with agreed upon requirements for both sides. Organizations had to provide participants and give sufficient support so that participants could complete the course. This included work time to train and study. Because two distinct types of software for such courses were to be tested across groups for training effectiveness, organizations had to agree to provide the computing power and the time to learn the software applications, scheduled at agreed upon times. Participants were required to complete questionnaires as their contribution to the research.

Finally, participants were required to sign agreements to engage fairly and consistently in the program, and consent to be respondents in the research component. They were made aware of project learning objectives and had to make a commitment to learn the software.

Commitment from all key stakeholders needs to be high and enduring

Written project agreements with all key stakeholders, before project commencement, were signed to maximize the probability of enduring commitment.

All key stakeholders must be involved in the development of learning process

There was a verification process where stated learning objectives were reviewed and agreed to prior to the training. No adjustments in the learning process were made during the course. At the end of the course, call center staff participants made recommendations for adjustments to the learning objectives for future courses.

Resource allocation must be adequate to carry the project to completion

Resources to support a project involves time, personnel support and funding. Funding to support the project was provided by our home institution, allowing for the hiring of an instructional designer/research assistant. Project management time, facilitation of courses and research time was coordinated by the two researchers (the chapter authors), who provided these resources on a voluntary, unpaid basis.

All project staff should hold the positions for which they are most competent

Roles and responsibilities were outlined and discussed among the core project team – the two researchers, who were also the instructors and instructional designers, and the instructional designer/research assistant. Through carefully designed communication plans and benchmarks, direct support was obtained from participant organizations. This came in the form of disseminating information, getting support from local computer technicians, and having participants support one another in gathering consent forms, assignments, research instruments, etc. All who contributed to the

project were competent for the jobs they were required to do – even those providing the smallest amount of support, such as requested participant peer support. The ability of contributors to effectively do their jobs was a key factor in the smooth running of this efficient project.

Communication plans must be appropriately designed, agreed upon and successfully implemented

The core project team, the project staff and middle managers from the organizations involved held regular meetings. Instructors were present in virtual learning sites for the participants and available via phone and e-mail. Incidental communication processes were implemented as needed; e.g. memos, faxed information, call outs via telephone.

High standards of production, in this case instructional design in online/elearning instruction, should be used

Standard instructional design practices were employed and verified in each step of the design phase. A curriculum template was developed based on the highest standards and finest detail possible and key adult learning principles were employed. Modules were pre-tested with mock participants with similar characteristics to target learners before implementation. Continuous feedback from participants allowed for adjustment where possible.

All learning material must be professionally created and presented

Learning management software was chosen for its track record - having been extensively used and tested. Materials were created with care and professional design. The digital library in the hosting institution provided material support for participants

The elearning project management process must involve the same program development process found in education. Principles of project management are required when program development becomes large and complex, such as projects to develop distance education materials (Whitten et al., 2001).

Project Stages

Project planning
Feasibility is the first phase in project planning; deciding whether the project should be implemented. Once there is approval and agreement to complete the project, it is scoped out in terms of the boundaries, major project outcomes, key stakeholders, completion date, and an overall budget figure. The information from the overall plan is summarized in the form of a charter and each of the stakeholders must sign the charter to show their commitment to the project.

The organization that sponsored the elearning project solicited proposals from faculty and staff for innovative research projects. A committee consisting of a cross-section of staff from the organization evaluated the proposed projects using well-established internal criteria. For the elearning project, a proposal was developed and submitted for funding from an internal research fund. The proposal submitted for funding included the major project outcomes, the stakeholders in the project, the budget for the project and the project completion time. The researchers agreed on the project plan and submitted the proposal for possible funding of the project, and the proposal was accepted and funded.

Analysis
It is critical to analyze the characteristics of the user of the proposed elearning materials so that they can be effective. Another technique is to involve the user in determining the requirements of an elearning system (sometimes referred to as "use-case analysis"). During the analysis phase, detailed learner and content analyses are conducted. Learners' education levels must be determined so that the developer can decide at what level to write the materials and to identify pre-requisites for the learning. In addition, the capability of learners to access the materials must also be assessed. This has impact on which technology to use for the delivery. For example, if learners do not have video capabilities on their computers, designers should avoid using interactive or streaming video, as learners will not be able to access such media.

Proper analyses must be conducted to identify what students should learn and to allow designers to chunk the materials into manageable units for development and for use by learners. Developing instruction in small units can result in maximum re-usability of the materials and flexibility in development and delivery (sometimes referred to as the "learning objects model"). For example, rather than develop materials for a forty-eight hour course,

the course could be broken down into six to eight modules of instruction. Instruction is then designed around the modules, which makes it easier for testing and implementation. Modular development allows each module to be piloted with learners and implemented separately.

Design
The major activity in the design phase is to identify the specifications for the distance education materials based on learners' characteristics and the requirements identified in the analysis phase. The design phase identifies strategies to use to achieve the learning outcomes. The instructional designer works closely with the content experts to identify the instructional and learning strategies. During the design phase, prototypes are developed and provided to the users for feedback on the prototypes. The project team uses the feedback to revise the design. The design phase is iterative where there is on-going revision of the prototypes base on feedback from the user. Eventually, the prototype will become the real product after suggestions by the users.

Development
During the development phase team members use the specifications from the design phase to develop the learning materials. As the learning materials are developed, they are formatively evaluated by asking experts to review them, and pilot tested with a small group of learners from the target audience. For this project, the faculty members prepared the learning materials and gave the materials to an instructional designer to program and build each elearning lesson. The faculty members reviewed the elearning materials as they were being developed. As well, a small group of learners was allowed to review and try the elearning materials as they were being developed. Feedback obtained from the pilot testing was used to develop the final draft of the materials.

Implementation
After the learning materials are thoroughly tested, they are implemented with the target audience. During the first implementation, the delivery is closely monitored to make sure it goes as planned. Also, summative evaluation is conducted to determine the effectiveness of the learning materials and the delivery.

During the implementation of an elearning project, students and staff who participated in the delivery of the elearning materials are trained on how to use the technology and how to interact with the materials.

Support
During the first and subsequent implementations, proper support must be available for learners to successfully complete the lessons. Support activities include fixing any technical problems, helping learners with content questions, and motivating students. The instructors assigned to the project provided support to students. The instructor answered e-mails, marked assignments, moderated computer conferences, and diagnosed simple technical problems. At the same time, a technical expert was available to solve any hardware or software problems students and the instructor may have had during the course.

Evaluation
Key stakeholders provide detailed feedback on project processes and outcomes. This critical information is the keystone to both project and program improvement. In this project, evaluation data was analyzed and the results communicated to all stakeholders.

Planning and Delimitations

The initial phase
Like much serious work, the idea for the project emerged out of a conversation; one quite casually started on a road trip to the campus situated in the geographic center of our province, several hundred miles away from our respective residences. The two authors were discussing the need for greater understanding about the generation of affective learning outcomes in distance education, particularly in online learning. In less formal learning settings, characteristics like attitudes, values, motivation, discipline, thinking and communication skills are effectively learned through a process called *socialization*. The socialization process occurs when agents of socialization (parents, teachers, peers, significant others, mass media*)* provide models, examples, suggestions and context for appropriate social development (Himelfarb & Richardson, 1991). This provision is made through social interaction, defined as mutual or reciprocal action with 'others' in a social environment.

To facilitate learning in the affective domain, we suggest that education must look more carefully at processes of interaction to foster learning outcomes. There is much evidence of the impact of academic and social interaction on learning

outcomes (Pascarella & Terenzini, 1991, 1998), particularly on values development. Just like more informal socialization processes, affective learning is dependent upon interaction, reflection and feedback from others.

The human experience of 'affect' is an area often ignored in human social interaction and rarely addressed in education (Vinson, 2002). At the same time, affect is a central part of living and learning. It is defined as emotion, feeling, desire leading to action; the conscious subjective aspect of an emotion and embedded in a complex of experiences including cognition and context.

Affective learning is related to, but exists outside of, cognitive processing. Learning outcomes in the affective domain relate to external expression of internalized emotion through attitudes and values (Krathwohl, Bloom & Masia, 1964; Gagne, Briggs & Wagner, 1992). Because of the very personal and intrinsic nature of affect, outcomes can be difficult to measure.

In formal education, attributes that represent behavioral outcomes are fostered over affective outcomes. According to Krathwohl, et al. (1964), the affective domain represents external expression of affect through the following activities: receiving (demonstrating the willingness to listen), responding (demonstrating active involvement), valuing (demonstrating choice in involvement), organizing (demonstrating willingness to advocate), and characterization (demonstrating willingness to change one's behavior, lifestyle, or way of life).

In workplace training, affective learning emerges as so-called 'soft skill' development. No consensus has been reached on the definition of soft skills, but they are identified by MacLeod (2000) as the following: ability to communicate effectively, creativity, the process of analytical thinking, problem-solving processes, leadership skills, team-building skills, listening skills, diplomacy, flexibility, change-readiness and self-awareness. These skills are deemed to be critical to effective performance in the workforce; it is also suggested that they are in short supply by the same author.

A number of contextual features and learning activities need to come together to facilitate affective learning (Gronlund, 1999). Key facilitation strategies are identified as: the presence of emotional and psychological safety, opportunity for interaction, the observation of demonstration of new and appropriate models of behavior, activities that promote self-awareness, activities that promote self-reflection and the opportunity for application of new behavior. Moving these facilitation strategies to online learning environments requires careful attention. Because successful 'socialization' is part of required learning outcomes, interaction opportunities are paramount in the online setting. Online interaction can be synchronous or asynchronous with other participants in an online learning activity.

Creating the plan

Ten qualified organizations were chosen to participate in the study. To qualify, an organization had to have the computing sophistication to support the required software, have a help desk or call center of at least ten people, and the resources to allow participants the time to engage in the training. The sample of respondents was comprised of help desk analysts and call center staff members who either volunteered or were mandated to take the program. From this convenience sample of forty-four, participants were randomly assigned to one of two groups: ElluminateLive required scheduled participation at a specific time, on a specific day, while members of an asynchronous group participated on their own individual schedules, using WebCT learning management software. Several participants were moved between groups to accommodate this schedule. In the end, there were 23 participants in the asynchronous group and 21 participants in the vClass synchronous group.

Estimates of soft skills competency were identified in a self-test before training, to establish an initial baseline. This self-assessment, also in the pilot stage, was completed the week prior to training via an e-mail request. Nine soft skill concepts, as identified by HRSDC, were each given two items. Each item offers a statement regarding behavior, to which participants responded on a Likert scale about the frequency of his/her own behavior.

The course was designed with a focus on the generation of affective outcomes for learners in online environments. Four learning modules, each with three topics, structured the course. Each topic followed the same instructional process: introduction, objectives, personal objectives, content presentation, demonstration, application, and personal reflection.

Facilitation for affective learning was maximized in the following ways. A 'high-touch' learning

environment was created in both WebCT and vClass. High-touch learning environments include facilitation that is learner-centered, with demonstrable validation and, wherever possible, accommodation of student needs and objectives. Facilitator immediacy in reference to requests and feedback was a priority. This was accomplished online through timely responses to postings, e-mails, telephone calls and questions asked in synchronous discussions. Explicit identification of standards, requirements, customer service models and exemplary customer service models provided external reference for individual actions. Self-awareness exercises, reflection opportunities, practice requirements and application exercises were designed to encourage high levels of engagement.
The WebCT software offered continuous access and specific instructional components for the members in that section of the course. Asynchronous threaded discussions were part of each module, each conference being available for one week.
Synchronous chat was available but not structured in any part of the course. Content presentation included text, audio clips and video clips. Exercise sheets and workshop directions were available in the same virtual location. Separate discussion areas and whiteboards provided support for group projects and their presentation. The site was available at all times, every day.

For the other group, vClass was available once per week, for one hour. This platform offers synchronous online presentations, with audio interaction among participants and between participants and the instructor. Synchronous text chat is available for those in the vClass session during the online session only. Group work and application sharing is available within the platform. Collaborative assignments provided the opportunity for students to work together outside of class time.

The key treatment variable in this research is type of interaction. High levels of interaction between students and student-facilitator were fostered. Interaction was directed toward fostering reflection, thoughtful consideration, and examination of personal responses to events around relating to others.
Project Resources

Resources fall into three main categories: time allocation, human efforts and funding. The project managers' home institution funded the project. This allowed for coverage of material costs and the salary of the research assistant. Other resources were allocated through regular work time of the project managers and all others involved in the project.

We identified the needs of the project carefully and then hired according to unmet needs; this ensured competency requirements were covered. Organizations participating in the project had to have certain minimal capacities so that their resources weren't tapped unreasonably and organization staff could assist with the administration of the project.

Scheduling and Estimating
Activities and timelines are central pillars in a complex project. These components must be estimated (in terms of character, monetary costs and time costs) and scheduled according to how much time is needed and the benchmarks for the project. The project plan had to be constantly monitored, adjusted and communicated. Deadlines were identified and adjusted when necessary. Some deadlines were more critical than others; communication with all project participants, particularly on the deadlines that can't be moved, was key.

One project manager was in charge of monitoring activities and timelines, with support from the rest of the core team. At times, required activities emerged as the project unfolded, requirements that couldn't be identified ahead of time. In several organizations, technical staff were unable to open the organization's firewall to allow participants access to the course site. This 'trouble shooting' required additional problem-solving and a change in start times for activities that followed.

Communications
Communications plans outline types of communication processes and frequency of communication. For this project, a communications plan identified all participants and the hierarchy of 'need to know' and 'for information only' messages. Normally a communications plan includes a roster of communication opportunities such as: group vs. individual information dissemination, general information presentation vs. individual information exchange, meetings, mail-outs, e-mail, web-based information, fax and telephone calls. Communication, either one-way or two-way, was required for project orientation, presentation of required activity, project

updates, project adjustments, problem or challenges encountered and project results.

Face-to-face meetings were not possible or desired in this project. It would have been possible to have audio-teleconference meetings, but they were deemed to be too time consuming and unnecessary. Broadcast messages went via e-mail, and specific individual discussions were held by phone, with e-mail follow-up. Once courses were up and running, information to participants was disseminated via course sites. In all cases of critical communication, e.g. changes in important dates, two-way communication was requested.

Tracking and Control
Tracking and control means just what it says – staying on track happens through detailed monitoring and control of project activities. Documentation of required activities provides a system of project data by which to track project progress. This approach can be more or less detailed, but is especially valuable for when a project includes multiple organizations that are geographically distributed. Tracking of activity and visible deliverables is an effective and accurate way to assess progress compared to rough, subjective reports like "we're about 50% complete on this task..."

The project employed some detailed documentation of progress, but focused very much on course commencement and course completion. Once the course commenced, the detailed structure of module progression kept all participants on track, or least very aware of where they should be. Preparation before the course was somewhat rushed as the course commencement date was relatively fixed. Course wrap-up (after last module was complete), however, could have been complete much faster than it took place. Sending and tracking return of evaluations, sending certificates out and contacting all stakeholders with final reports was more open ended and spread over several months.
Project wrap-up

Project completion is often overlooked as a stage, even though it is one of the key phases of managing any project. Wrap-up time provides an opportunity to capitalize on important things that can be present during a project's final phase: revisiting objectives with all key stakeholders, identifying examples of criteria to determine project's level of success and creating adjustments in project plan to prepare for the next project roll-out. The success of the next project can be improved through due diligence in wrapping up the current project.

This project was weakest in the wrap-up process, as many things began to impose on the time of the core team, creating constraints on what could be accomplished. The original wrap-up process was designed to include evaluation from all key stakeholders, feedback to all course participants, course certificates, final reports to associations and organizations involved, and a request to indicate willingness to participate in future projects. Only a portion of these activities was completed.

Project Results
All key stakeholders reported high levels of satisfaction with the project processes and outcomes. The most specific feedback for changes to the project came from those most involved in the training – the staff themselves. Learning objectives were met as measured by exam scores; however, participants provided suggestions regarding additional objectives and improvement of the interaction with the technology. Because sound communication and ongoing evaluation procedures were in place, the project was massaged and adjusted during the process to meet all required objectives as fully as possible.

We were unprepared for the time expended to manage the dynamic, changing nature of the project. Communication clarity and efficiency (incoming and outgoing) was in constant need of adjustment. Communication did not flow out uniformly in terms of time and, at times, in substance. A tighter communication plan with appointed communication senders and receivers is critical. Asynchronous communication requires that receivers acknowledge receipt of information, rather than having the sender assume information has been received.

Communicating in a virtual environment where there is no face-to-face interaction led to inefficiencies. It was difficult to determine the frustration level of students who were having problems with the elearning materials. Instructors had to watch for and support slower students to determine if they were having problems.

Technology challenges existed on two fronts. While organizations validated levels of computing power, other issues regarding security arose. Technicians in support of the

computer system will be consulted in the next running of the project. Participants needed more support and more time than originally allocated to become oriented to the software. This extra activity and time will be built into next project plan.

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Chapter 15

How can elearning contribute to education for more sustainable development? Lessons in project management.

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Abstract: This chapter presents learning extracted from a case study relating to the Dorset Education for Sustainability network (EfSN) (Kershaw, 2004), an education network managed primarily as an e-learning project, with the aim of bringing 'expert' debates into the public domain. The learning focussed on issues around information transfer across organisational boundaries and on mechanisms used to promote participation, as well as on the relationship between e-learning and social inclusion. It explores the purpose of networking in relation to information exchange, and postulates the existence of three levels of information exchange, achievable electronically. The chapter concludes by summarising a methodology for assessing attitudes to education for sustainable development, using an on-line questionnaire, tested through a pilot study and suitable for larger scale research. The project presents real-life research into a case in which e-learning helped to define an emerging education agenda and it raises a series of issues regarding the management of e-learning projects, including possibilities, pitfalls and ethical dilemmas. The research referred to is fully written up elsewhere, this chapter seeks to extract learning points relevant to project managers and to explore them in an easily accessible format. (188)

Key words: E-learning, gatekeeper, participation, social inclusion, sustainability, sustainable development

This project, the Dorset Education for Sustainability network (EfSN) (Kershaw, 2004), brought current social debate around education's role in promoting more sustainable development into the public domain, through a network comprising a dispersed interest community (Wilmott, 1986) arising from an electronically linked community of interest[1]. It exemplifies how practice can inform theory, bowing to 'Southern wisdom' in stressing the importance of grassroots movements, finding that ecology, health and economic development can no longer be left to the experts but must be a part of "people's organised concerns"(Wignajara, 1993). As an e-learning project it brought 'expert' debates into the public domain, with the aim of enabling change, for "It is when new knowledge meets old institutions that social change starts" (Goldblatt, 2000: 157).

This pathfinding project exemplified an evolving approach to the management of an online learning project with no agreed aims at the outset, rather a belief that electronic communication would enable participants to communicate effectively by engendering information transfer across organisational boundaries. This combined with the project manager's belief that the web-based platform would provide a medium by which both the content and the process of effective ESD could be explored.

A key issue for the project was participation, and the project tested methods for getting people

[1] See: http://www.dorset-lea.org.uk/efsn/pages/efsnet.htm

involved, including an on-line audit and a bulletin board. Recent UK government advice states that effective ESD should be targeted, requiring an understanding of individual starting places (E.A.C., 2003) and that putting information on-line is not, in itself, transformational. The indirect contribution played by e-learning to the development of sustainable communities may be more important than ESD itself, and the initial regional sustainable development framework for the South West of England (Sustainability Southwest, 2000) identified two key concerns:

1. What role do learning and skills play in improving sustainability?
2. What role does sustainability play in improving learning and skills?

The first is a wicked issue. Social inclusion is a complex phenomenon, characterised by the interdependency and influence of many factors, for example housing, health and educational opportunity (Scottish Museums Council, 2001). The role of e-learning is similarly complex, including relatively linear relationships such as increasing the number of active learners (Sustainability Southwest.2002) through to contributing to complex societal trends. A key learning point for other e-learning project managers is the facilitation and enablement of secondary projects, commensurate with complex objectives, in this project I have summarised research into people's attitudes to ESD across the parallel education systems of museums, libraries and arts and the trialling (G3) an on-line audit of ESD competencies.

Lessons learned

Effecting information exchange

The network was an equal partnership with overt agreement that an up to date contact list, available electronically, would be the backbone of the project. This gave rise to two main lessons for project managers. Firstly, a certain critical mass must be achieved in the level of co-operation and exchange of information before online interactions can really be called a "network" (Thorelli, 1986) and security of information was very important in encouraging participants to freely exchange data and information. My subsequent research regarding network activity defined three levels of information sharing, 1), interactive, or two way debate such as face to face conversations or telephone calls, 2) active sharing including the passing of documents between and among organisations, and 3) passive sharing when organisations only make information available remotely or through display (Kershaw, 2004). I facilitated all three types of information exchange through a set of meetings, supported by a website. A future goal in managing this type of project would be to implement all three levels of information exchange solely by electronic means.

Evaluating the benefits of partnership

A second learning point concerns the value of on-going formative evaluation of such projects including measuring the effectiveness of information transfer. As an equal partnership, participating organisations needed to identify exchange of information as a goal and my role as project manager included setting up interfaces between organisations both electronically and face to face, which enabled synergy and exchange of information to occur. Getting others to participate was relatively simple, ensuring longevity of the relationship was more complex and formative evaluation may have legitimised involvement of certain organisations by quantifying costs and benefits. Research has found that many evaluation exercises concentrate on measurable outputs like financial data, rather than on the impacts or effects of the partnership itself (Goodwin, 1998 and Stoker, 1996). I went on to quantify a method for measuring the effectiveness of information transfer between organisations which may prove useful for considering joint agency working over cross cutting issues (Kershaw$_1$, 2004): other project managers will determine their own priorities for evaluation.

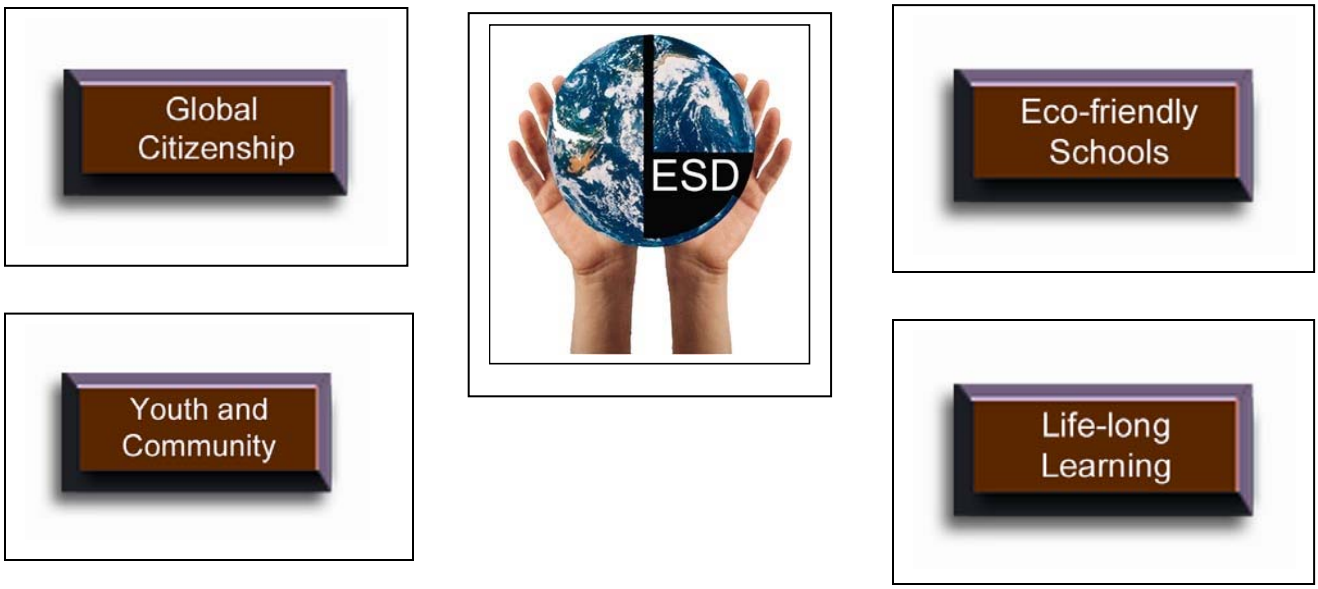
Using e-learning to define both content and process

The network started with the principles of equal partnerships, mirroring the Japanese concept of 'keiretso' (Thorelli, 1986), reflected within the website design and layout where hands supporting a globe were used to illustrate inputs to and outputs from effective ESD.

The home page illustrated the contributions played by the different sectors of education to sustainable development, with strands of learning including those identified by Barber (1997) matching the project stakeholders and illustrating the local vision and breadth of sectorial involvement. As both project manager

and web-designer I used the home page to define content, while developing subsequent pages to explore process within each sector by linking inputs and outputs into a series of web pages which provided information, strategy documents and numerous links to other site. The web page was designed around my visualisation of content and process, rather than the needs of people accessing the site, who later requested that a summary of all contacts and links be grouped together on a separate web page, rather than being spread throughout the site. A learning point for other project managers concerns minimising the complexity of design and surveying user need as a first step.

FIG 1 Home page of ESD network



Project manager as 'gate-keeper'

Establishing a website represents a positive decision by participating organisations to utilise representational media and to move into the sphere of mass communication. As the project manager and controller of the website I was aware of being responsible for selecting a sub-set of the total information available and of compressing certain areas while elaborating others. A useful learning point from the project was the importance of not raising expectations among other educators regarding any possibilities for financial or other reward e.g. I was approached by an African charity worker needing financial assistance in order to purchase necessities such as bicycles for her project. Eventually the request was dealt with by an UK based religious charity but initial communication was difficult; what information were we entitled to make available about social justice and global responsibility if we were not prepared to assist a small but essential practical project in the developing world? In addition, the website used many images to portray messages about sustainable development, requiring consideration of the potential cultures of understanding, or worldviews of site users (Longman and Lacey, 1993). For wealthy nations, sustainable development often means policies concerning issues such as recycling, energy efficiency and conservation while for poorer nations it may mean policies for equality, fairness, respect of the law, redistribution of wealth and wealth creation. The images were carefully chosen to satisfy inclusivity principles, paying attention to research proving that photographs of people with eye-to eye contact have more impact than those that are more detached (Van der Gaag and Nash, 1987). As project manager I was wary of relying too heavily on images as the computer generation of images of a very high quality can make such images almost indistinguishable from real images. Any future website development would have the source of all images accredited and their authenticity annotated on the screen.

The website was used as a resource for educators, at a workshop devised for the Oxfam Global Citizenship conference (2000) stressing the similarities between skills of Global Citizenship and those of obtaining information from the Internet, including discerning information, and selecting and prioritising without discrimination. My learning included that the use of media allows control of the truth and that the website designer acts as a gatekeeper by controlling which information and images are used. To quote Chomsky (1991) 'What is useful is true'.

Participation in e-learning: possibilities and pitfalls

Sustainable development is not a bank of information, but rather, a set of values, skills and understanding of knowledge (Cherrett, 1999). The site included an on-line audit of key competencies for ESD, and a bulletin board for the sharing of good practice. The latter was an attempt to enable positive engagement in the complex issues of sustainable development, defined by the United Nations as, "the biggest challenge this century" (Anan, 2001). The project included an audit of key competencies relating to sustainable development and education, with organisations being required to audit their own performance and to highlight areas for attention. I decided to use the broad, subjective terms: 'started,' 'in progress' and 'OK' deliberately, rather than to use any quantification of progress as not all representational measurement involves numbers (Dawes and Smith, 1979) and my intention was to develop a tool which would encourage increased participation in the process.

As the project manager, I found that assessment was the most controversial area of the work and have distilled the findings into a series of project management learning points:

- Establishments noted the need to allow for negative or neutral association (Schuman and Presser, 1981) there is a difference between not yet engaging with a process and not intending to engage with a process.
- Salience of the issues was vital to engender participation in the process and one challenge in project management is to allow such an audit to act as a catalyst for engagement rather than as a constraint on possible responses. For example: a ban on smoking would serve to alienate many of the young people served by the Youth and Community Service and although ultimately desirable it would inhibit the Service from fulfilling its primary objective of engaging with disaffected and often excluded youngsters.
- The choice of symbols affected participation levels, e.g. the signal, 'OK' accompanied by a circle between thumb and forefinger as used by an underwater diver was used to represent that all was well. Consultation with schools indicated that although the audit had raised the issues and encouraged organisational change but that the symbol was considered more appropriate in some sectors than others. Other project managers could learn from this, developing a range of logos and units of measurement appropriate to each sector.
- A further participatory mechanism was devised through the development of an on-line bulletin board used to submit details of projects, which would then be displayed on the website. As project manager, I was working closely with WWF-UK and attention was being paid nationally to what good ESD would look, but later national working groups agreed that the term "sharing effective practice", would be less contentious. The bulletin board proved ineffective in practice as after the site was launched the e-mail address was regularly inundated with offensive e-mails. Salient project management learning included the need to determine such assessment criteria at the outset, as well as the need to safeguard the site.

Supplementary research: attitudes to channels for learning, an online survey.

I have referred to the relationship between inclusive access to educational opportunity and the development of sustainable communities. Project research concludes that, 'while basic education has independent value, it is the focussing of that basic education on the sharing of knowledge skills and values which is important' (UNESCO, 2003). An important project management role involved facilitating supplementary research. My analysis of the relationship between education and sustainable development led me to devise an audit of ESD channels, with reference to the UK government's Environmental Audit Committee report (EAC, 2002-2003), developing a Likert scale to consider both attitude and strength of response (Robson, 1993).

The survey contained thirty randomly mixed positive and negative statements from reliable sources relating to ESD channels, chosen according to their ability to identify with or contradict a chosen aspect of the SDE agenda, for example inclusive access to educational opportunity or global citizenship. The aim was to assess how strongly people felt about the ESD opportunities afforded by each sector, with the survey being designed to eliminate sectors which did not enable discrimination between positive and negative responses. This was one of a wide range of supplementary research and projects spawned by the initial e-learning project. Effective on-going evaluation would have referred to the impact of these 'offshoots projects', many of which may have greater longevity than the original e-learning project, illustrating an effective evolution of projects. The results of my attitudinal research are given elsewhere (Kershaw, M, 2005), but the methodology uses on-line positive and negative statements to differentiate between attitudes to education sectors or channels of learning as below. (FIG.2).

FIG 2

8	**New information technologies offer news and information from all over the world which can help the poor to be heard.** *Department for International Development (2000), 'Making globalisation work for the worlds' poor.' Dec. 2000*	**1 2 3 4** strongly disagree- disagree- agree-strongly agree

The on-line survey was effective as a research tool, but learning points included:

- A requirement for need pictures and simple language, with a range of formats for different organisations, as on-line audits were not universally accessible.
- The attitudinal choice should be increased to 5 to include a don't know section as research demonstrates that substantive responses may be chosen in error when a 'don't know' option is not available (Schulman and Presser 1981, in Kershaw , 2004)

Conclusions

E-learning presents a real opportunity both for sharing practice in educating for more sustainable development, and to connect with the social inclusion agenda through contributing to the knowledge economy and increasing access to educational opportunity. This project presents real world research into the effectiveness of early practice, connecting the quality of life agenda with different sectors of education. Particular reference is made to the following four e-learning agendas:

- Information exchange
- Process and content
- Participation
- Potential channels for ESD

Local priorities concerning links between social inclusion and education are part of the bigger global picture where inclusive access to education is not available. Even where access is available the quality is suspect as "most poor children who attend primary school in the developing world, learn shockingly little" (Sachs, 2005). E-learning offers many opportunities for participation in education for sustainable development through transferring information and exchanging examples of effective practice, in both local and global communities, as well as facilitating learning about sustainable development through providing access to information and knowledge. Project managers in e-learning should be fully aware of their impact on global access to information and the potential value they may add to bringing about more sustainable development.

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Chapter 16

Implementation of e-learning in the Australian Customs Service

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Abstract: Managing an e-learning project is similar to any project process, for example building a house. You need to identify what the product will look like when it is completed, then develop a plan that enables all the components to become the anticipated whole. In determining the suitability of e-learning as a delivery method, the Australian Customs Service identified expected outcomes; developed and implemented a project plan and project structure to achieve the expected outcomes; and then evaluated the real outcomes against the anticipated outcomes.

Key words: customs service, e-learning, project management

The Australian Customs Service ("Customs") manages the security and integrity of Australia's borders. The agency is a national organisation employing more than 4,900 people in Australia and overseas, with its central office in Canberra. Many staff in Customs work on shift at border entry points, including air and sea ports. It also operates a fleet of ocean-going patrol vessels and contracts aerial surveillance providers for civil maritime surveillance and response.

The aim of this case study is to provide readers with insight into the project management processes that were followed when implementing e-learning as a viable learning delivery method for Customs. This includes exposure to the tension a project manager experiences when matching expectations with real and practical considerations.

Project Objectives
A key objective of this project was to determine whether e-learning was viable within Customs. This included investigating the following issues:

- Potential return on investment (ROI);
- Learning effectiveness of on-line learning;
- Type/s of technology that can be used;
- Courses suitable for e-learning;
- Skills needed to manage, deliver and implement e-learning within Customs.

The following issues were considered at the start of the project:

- Business case – purpose of project
- Project structure – how the project would be managed
- Project plan – what the project would do.

A business case was developed that clearly outlined the purpose and outcomes of the project, and funds needed. The project purpose was to determine the feasibility of e-learning within Customs, and whether the following anticipated project outcomes were achievable:

Learning delivery cost savings, and increased learning delivery effectiveness.

A two-level structure that included a Steering Committee (senior managers) and a Working Group (middle managers) was developed to encourage broad ownership. The Steering Committee provided overall direction and management, and defined the operating framework for the Working Group and the project manager. The Working Group supported the project manager to ensure the successful completion of the project.

This type of project structure suited Customs matrix-based2 organisational structure and was critical to the success of this project. Once the structure was put into place a project plan was developed that identified the project activities and how they related to the outcomes identified in the business case.

Project Implementation
The implementation of this project was broken into the following two phases:

Phase 1: Development of Customs e-learning capability; and

Phase 2 : E-learning pilots.

Phase 1: Development of Customs e-learning capability

At the start of this phase a baseline of Customs current capabilities was identified through a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis. An examination of the SWOT analysis identified the following:

- Need for a mature learning system within Customs that worked for both face-to-face (F2F) and e-learning; and
- Resistance to self-paced learning, whether paper or electronic based.

In developing a mature learning system that worked for all types of learning, Customs used the following three-pronged approach:

- Comparison between the components of e-learning and F2F learning systems to identify differences and similarities;
- Site visits to learn from other organisations implementing e-learning, and
- In-house workshops by leading thinkers, exploring different aspects of e-learning.

The comparison identified that the components of both face-to-face and e-learning systems were basically the same. A key difference was that e-learning allowed some of the components to be automated.

The key components of a learning system identified through this comparison were:

- Learning Administration
- Learning Standards
- Content
- Assessment
- Delivery.

It was noted that with introduction of e-learning, the process of learning had not changed, only the number of delivery methods available had increased. This comparative process helped the working group discover that e-learning was not an end in itself, but just another delivery method able to be used for the delivery of learning.

In conjunction with the above process site visits to a number of organizations occurred, and Customs specific e-learning workshops were conducted. The following lessons were learned from both these activities:

- Importance of including key stakeholders in the e-learning strategy development process;
- Learning to be contextualised to enable the easy transference of learning into the workplace;
- The importance of senior executive sponsorship at as high a level as possible, as well as buy-in from senior management (this reduces the impact on the project when a sponsor leaves or is moved to another position);
- Marketing of e-learning was as important as the e-learning material itself. The early experiences that an organisation has in using e-learning need to be positive (the initial courses chosen need to be important from an organisational perspective, and the selected pilot participants need to be able to enthuse others), and
- E-learning needs to be seamless, enabling participants to concentrate on the learning process, rather than be impacted by IT issues.

[2] Within Customs the matrix based organizational structure allows a vertical and horizontal functional flow of responsibility across regional and central office components of the organization.

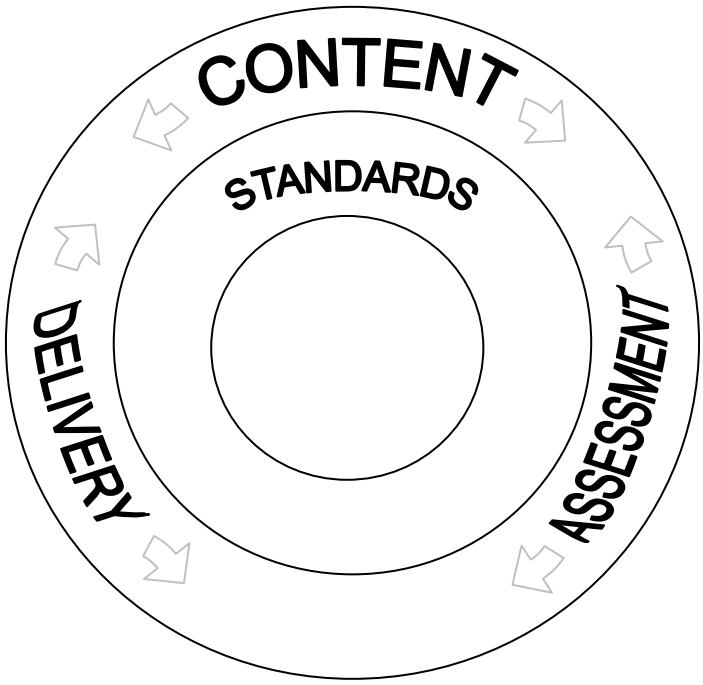

Figure 1: Components of a Learning System

The level of resistance to self-paced learning was measured through a series of focus groups that were conducted. These focus groups confirmed a negative reaction to previous self-paced learning. There were a number of reasons for this negativity. One of these is that self-paced learning materials were not always been easy to use because the medium was not streamlined and tended to impede the learning process by providing too much information for the learner to access. Also, self paced learning by its very nature focuses on the content and not the relationships between learners and course facilitators. Within the e-learning system there needs to be a focus on the collaborative component of the learning process while still ensuring the effective transfer of relevant content.

Another key issue was the need for self-paced learning to be valued by supervisors and managers in the same way that face-to-face learning is valued. This value can be demonstrated a number of ways. One way is to ensure that sufficient time is provided at work to complete the e-learning. Where this does not occur e-learning is devalued, as staff are normally provided time during work to complete face-to-face learning. Another way to demonstrate value is for the supervisor to participate in the learning as a mentor/coach throughout the learning activity.

Workshops were conducted to expose senior and middle managers to different aspects of e-learning. The following areas were explored through these workshops:

- Collaborative use of e-learning;
- Instructional Design aspects to be considered when developing and delivering e-learning; and
- Strategic implementation of e-learning.

Phase 2: E-learning pilots

E-learning pilots were conducted during the second phase of this project. The aim of these pilots was to identify whether the following e-learning advantages could occur within the Customs environment:

- Better learning results through increased content retention and transfer of learning;
- Consistency of learning delivery;
- Ability to individualize learning to suit the participants' needs;
- Minimisation of time away from work;
- Learning time reduced without loss of learning effectiveness, and
- Increased cost effectiveness.

The Detention and Search blended learning program was used to pilot whether e-learning would increase, or at a minimum, have a neutral impact on knowledge retention, and also whether it would decrease the time taken to complete the program. As part of the evaluation strategy face-to-face (F2F) and blended learning courses were conducted at the same time, for staff seeking to acquire Detentiuon and Search skills A comparison of k*nowledge retention* and *learner satisfaction* between these two groups was evaluated.

Knowledge retention was evaluated through a comparision of the knowledge tests at the end of the training and spot quiz results conducted during the focus groups (approximately four weeks later). The following graph shows a comparison of the averaged results between the F2F and the blended learning groups.

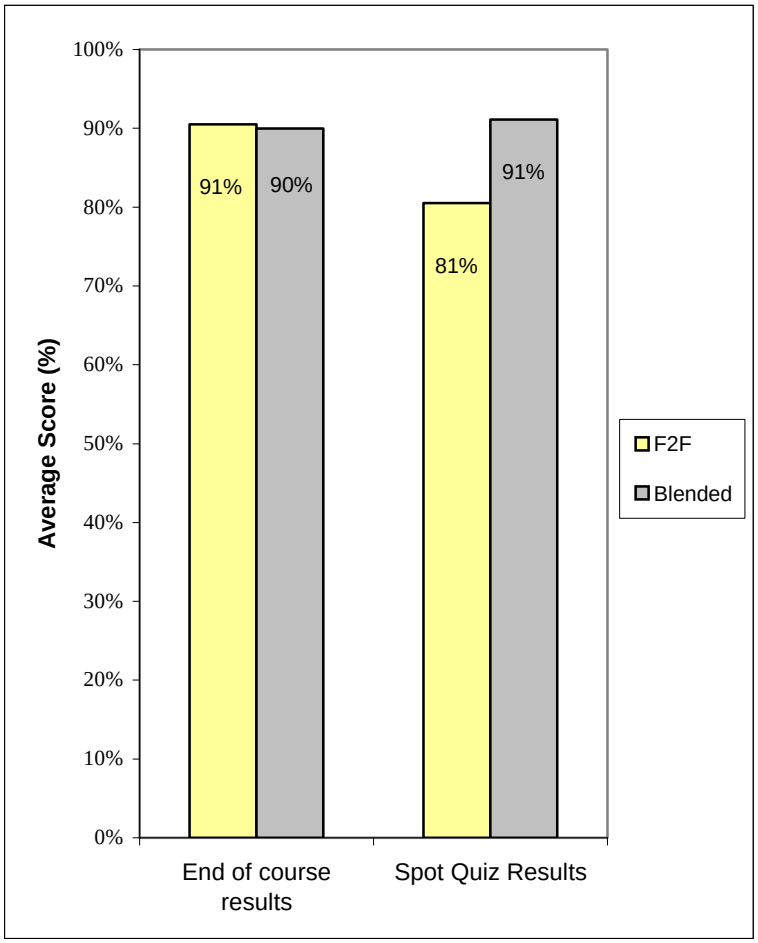

Figure 2: Comparison of Average Assessment Results

Figure 2 shows that there was very little difference between the average results of the two groups at the end of the course. However a month later the spot quiz results show a 10.6% difference between the two groups, with a marginal increase in the blended learning group average and approximately 10% reduction in the F2F group average.

Figure 3 (below) shows a comparision between participants in the two groups who achieved the minimum pass mark of 90% or greater during each of the assessments. There was little difference at the end of the course; however, the spot quiz results show a dramatic difference between the two groups. From the spot quiz results only 8% of the F2F group achieved 90% or more, whereas 80% of the blended learning group achieved 90% or more.

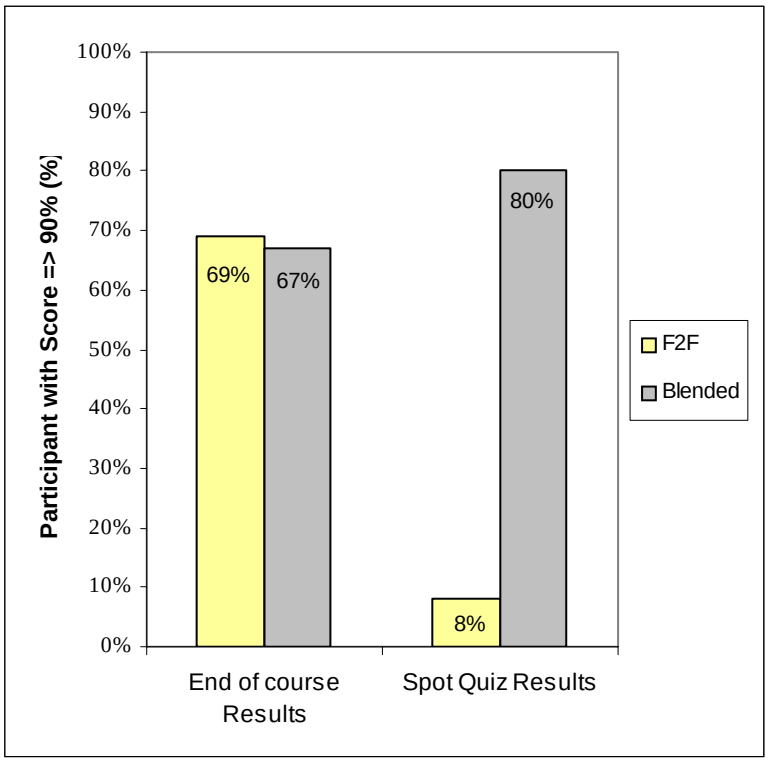

Figure 3: Comparison of Participants achieving scores above 90%.

Similar evaluation strategies to the initial pilot process were repeated during the re-certification process. Even though the results from the re-certification pilot were not as dramatic as the results from the initial pilot, both pilots indicate greater knowledge retention where the knowledge component of learning is delivered on-line when compared with F2F delivery.

Learner satisfaction was assessed through completion of surveys and discussions during focus groups. The participants of both the F2F and blended learning groups were asked to rate the learning program out of 10, with 10 = excellent and 1 = unsatisfactory. The following graph (Figure 4) summarizes the results of this rating. The blended learning group was marginally less satisfied with the learning program than the F2F group.

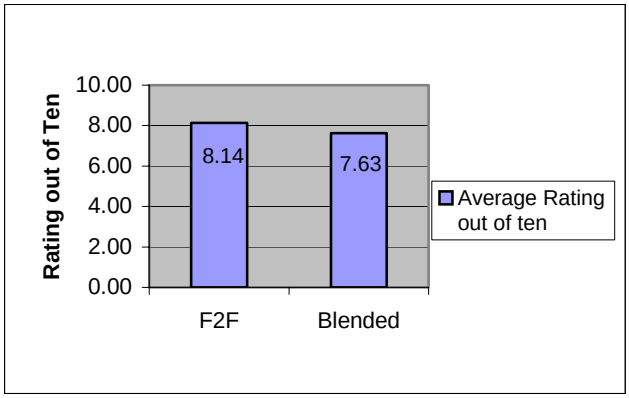

Figure 4: Comparison of Learner Satisfaction

Results from the focus groups indicated that overall the blended learning group participants generally liked the approach and considered that, for the subject matter, this approach to learning was more acceptable to them than face to face. Only one out of the sixteen blended learning group participants who attended the focus groups would have preferred to complete the training using the traditional approach.

The conclusions that could be drawn from the e-learning pilot evaluation results, include:

- Where the on-line learning process uses a *Mastery Learning* approach, there is a greater likelihood that on-line learning will have higher knowledge retention than F2F learning. This is due to the focus of *Mastery Learning* on improvements in learning by only allowing movement out of the lesson once they have achieved a high level of proficiency in the learning material (at least 80% correct).

- On-line learning increases learning retention as it allows participants to revisit the materials

- On-line delivery of Verbal Information and Intellectual Skills content provides higher knowledge retention than the "talking head" approach, and is a more effective way to deliver this content. In the past teachers have used both "talking head" and "facilitative" approaches in the F2F environment. On the basis of these results Customs seeks to deliver "talking head" content on-line, and use the F2F environment to deliver the skills and attitude component of the learning process.

Project management lessons learned

This was an extensive project conducted over an 18 month period. When managing such a complex project, you won't always get it right.

It is important is to continually learn throughout the project, and use what is learned to increase the effectiveness of the current project and for future projects. Some of the key lessons learned during this project, include:

- Ensuring that the project management process is in place at the start of the project, and includes:
  - Pre-planning;
  - Focus on what is achievable, not what would be great to do;
  - Develop an evaluation strategy early in the project; and
  - Pilot the process.
- Involving IT early in the process.
- Maintaining a good relationship with your stakeholders and providers.

Projects are dynamic and learning occurs throughout its duration. All of the answers are not known at the start of the project but are learned iteratively. However, it is important that project purpose and prime outcomes are clearly defined at the start of the process.

Pre-planning

At the start of this project there was a considerable amount of time spent on determining the project outcomes and the structure used to manage the project. This included consultations with key internal stakeholders at both senior and middle management levels. The purpose of this consultation was to identify what outcomes were expected from this project. Without the foundation of the consultation and planning processes undertaken at the start of this project, it would have been difficult to achieve the project's stated outcomes.

One of the strengths of this project was the project structure used. At the macro level the steering committee provided direction, advice and resources for the project and at the micro level the working group conducted the project activities. An important value that the steering committee gave to the project was their direction and advice which ensured the project activities were contextualised to Customs' needs.

This approach may not be suitable for all projects. In the same way that one shoe size doesn't fit everyone, there is no one project structure approach that fits all projects. The project structure used is dependent on the breadth and time span of the project. One would expect that a project that has a small budget and is anticipated to last only a few months would find the structure used for this project cumbersome and an imposition. What is important is that the project structure used needs to be considered and agreed upon at the start of the planning process.

Focus on what is achievable, not what would be great to do

It is important to recognise that for any one project, you will not be able to achieve all desired activities due to financial and physical resource constraints. Only the activities that are achievable and align to the project outcomes should be included.

It is important to clearly identify those activities that will support the agreed goals and outcomes. If this is not done, there is the potential for inclusion of activities that are not resourced. Inclusion of activities that are not directed at meeting the agreed outcomes have the potential to impact on the overall success or failure of the project.

Develop an evaluation strategy early in the project

It is important that a fully structured evaluation strategy is developed early on in the project. This evaluation must go much further that the "happy sheets" used for many learning programs. These "happy sheets" only provide an indication of how the participant has reacted to this learning and does not include the full impact of the program on the organisation.

In my experience, this is one area that is not usually completed effectively. One of the key reasons for this is that the goals and purposes of the project are not clearly defined. Without this it is impossible to know what outcomes you would expect to achieve at the end of the project.

Pilot the on-line learning processes

It is important that e-learning projects be piloted before they are fully implemented. The only exception to this rule would be if the e-learning program impacts a small audience.

Without piloting e-learning programs it is difficult to fully anticipate the impact they will have on learners. As part of the pilot process, it is crucial to involve the pilot participants in the redevelopment and review of the e-learning program before it is fully implemented. By doing this they feel ownership of the process and then usually become grassroots ambassadors.

Involving IT early in the process

The success of any e-learning project is dependent on a close partnership between both HRD and IT groups within the organisation. It is recognised that the learning component of an e-learning project needs to be scoped and designed by HRD staff. This ensures that the learning outcomes are maximised. However it also needs to be recognised that for e-learning to be effective it needs to be successfully delivered across the organisation's IT platform. A good understanding of the capabilities and limitations of the IT platform need to be considered early on. These factors alone can have a dramatic impact on which project outcomes are achievable, and which are not.

Maintaining a good relationship with your stakeholders and providers

At the start of a project, there is usually a considerable amount of optimism and goodwill between all stakeholders. For this optimism and goodwill to continue, relationships need to be nurtured and maintained by ensuring that there are no surprises, especially in terms of expectations. This needs to be done early and written down as part of the scoping process. This document needs to clearly identify:

- Your expectations; and
- What is expected of you.

To successfully manage an e-learning project, remember the following:

- Know what outcomes you need to achieve and will be accountable for; and
- Technology is only a tool, not an end of itself.

It is important to fully understand the outcomes for which you will be held accountable. This means that when you are asked to make compromises and changes, you know what you have to fight for, and what you can concede. Don't fight every change, only the important ones.

The key for success in managing an e-learning project is to always measure every activity against the project outcomes. By doing this you will find that some of the activities are essential, others nice to do and others that are downright dangerous to the success of the project.

Finally, don't be seduced by technology, no matter how exciting. Remember that the focus of e-learning should be on the learning, not the technology.

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Note:

The main sources of information for this case study were project documents written by the project manager (David Hill), based on input from both the Technology Based Learning Working Group and the Flexible Delivery Steering Committee.

Chapter 17

Quality management approach to reduce risks in an eLearning program.

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Abstract: The paper presents a project carried out by the Faculty of Science of Palermo University and the Institute for Educational Technologies of the Italian National Research Council regarding the realization of an eLearning BSc degree course "Science and Technologies for the Environment and Tourism". This one of the first on line university degree courses in which we have applied a project management approach and quality assurance theory in order to guarantee a planned and systematic control of the processes involved in the production of an eLearning solution.

In particular we will present the phases of the project from its conception to its implementation describing the structure of the BSc degree course, identifying the different processes involved, highlighting the roles of teaching, technical and administrative staff; we explain how we have broken down each phase into different activities and how for each activity we have identified teams, roles and responsibilities in order to produce effective management of the project.

We will show some process description schemas for monitoring and improving the quality of decision making and the management of the complex organizational, technological, and methodological aspects involved in the eLearning project.

Key words: eLearning, project management approach, Total Quality Management, eLearning process management, Quality of eLearning, Risk management, Distance Learning at University.

The rapid development of distance learning has encouraged an internationalization process of distance learning programs for an international audience of learners and faculties (Chalmers 2004, 1). In Europe the Bologna Process (European Ministry of Education 1999, 1) calls for a European Higher Education Area by 2010 in which staff and students can move with ease, while enjoying recognition of their qualifications throughout Europe. Much remains to be done in order to reach this goal, and faculties, departments and higher education institutions must be ready to provide high quality distance learning programmes.

Research regarding policies and procedures for quality assurance should provide answers to questions such as: How to guarantee the success of distance learning programs? How do we guarantee to potential employers the value of the skills, competencies, and qualifications facilitated by eLearning programs? What is the level of transferability of acquired credits from one eLearning program to another (online or traditional)? Which factors promote the quality of a distance learning degree? Which factors contribute to client satisfaction (or frustration) with web supported learning? Can an eLearning program provide an effective and worthwhile educational experience that can be recognized in

the European Higher Education Area? Thus, a set of standards, procedures and guidelines are needed to guarantee quality assurance of eLearning development initiatives

We believe that the success of distance learning programs starts from good planning and continuous monitoring of all phases of a project. Levy identifies six factors to consider in planning an online distance programme (Levy 2003) while other research suggests applying a project management approach as the methodology for planning an educational and training project (Lockitt 2000). The organization of a distance learning degree based on the rigorous application of project management methodologies and quality assurance is a real challenge and it is difficult to give simple solutions. We believe that the general principles of project management remain valid but it is necessary to transform them, bearing in mind the features that distinguish educational or training projects from other types of projects:

- *The role of society as a stakeholder.* A distance learning program must provide instruction of a high professional level so that a graduate is able to play a useful role and employ his skills within society. Institutions often neglect these needs, and simply offer students the opportunity to obtain a degree as quickly, as possible without guaranteeing the professional quality of the qualification.

- *Funding of eLearning programs.* From an administrative point of view, direct income resulting from enrolment fees usually doesn't cover the actual costs of developing and delivering an eLearning program. Often, it is essential to find other funding in order to guarantee the successful implementation of an eLearning program.

- *Overcoming institutional resistance.* A distance learning degree program often has its roots in an organization with lots of experience in the management of traditional degree programs. There is often strong resistance on the part of the institution to adopt new methods and technologies that may upset traditional educational formats. When an academic institution is creating and planning a new eLearning program, it should consider its experiences and values in order to overcome such resistance and to transform it into support for the project.

- *Recognizing the possible limits of the standardization process of education.* The move to standardization of on-line learning is driven by the need for infrastructures that support the interoperability of different learning platforms and different ways of communicating between different systems. It is important for an organization to recognize the constraints that such a standardization process could introduce. Because the technology is only a means of achieving a goal, not a goal in itself, technological infrastructures should not be designed and built without considering their effects on teaching and learning methods.

Starting from these considerations, we present a case study where we have applied a project management approach as a tool for quality assurance through a set of planned and systematic procedures for the development of an eLearning BSc degree-level program. This approach plays a key role in assuring quality development of distance education programs where the quality and the success of distance learning degrees are managed and controlled during all the phases of a project.

The eLearning BSc degree project

The on line BSc degree program "*Science and Technologies for the Environment and Tourism*" (STAT), the first completely Web based degree program organized by a public university in Italy, began in 2001. Currently the program is in its fourth year. The program has involved 60 students, 40 teachers and 20 staff members with different competencies: educational researchers in technologies and methodologies, members of the academic staff, experts in information and communication technologies (Seta 2003).

The curriculum for the program was designed to address a number of economic and social needs of the Sicilian region, in particular, protecting the environment and developing tourism. The curriculum focused particularly on the use of information and computer technology (ICT) in

this context. The students are introduced to the application of ICT to support human decision making processes to sustain the environment. This framework emphasizes the need to introduce ICT into the teaching process and to deliver the entire program via the Internet.

The online degree provides a distance learning environment where students can use interactive and simulation tools to carry out their activities. However, the students also have the opportunity to follow face-to-face modules, especially for the laboratory activities. Students only have to go to the university in Palermo to take their exams, in order to confirm their identities.

Students enrolled in the program are principally full-time workers, mainly men, with an average age of 30.

The team adopted a project management approach, and its traditional breakdown into four principal phases: conception, development, implementation and closure phases. In all these phases, attention was paid to the quality management defining tools and procedures for measuring quality. We felt the need to monitor the entire program using different control rules and measures, to evaluate the students' results and consequent employment, to measure student and teacher satisfaction to control the quality and to improve it. We also considered the reactions of the academic organization with regard to a better integration of traditional degree programs and eLearning programs. Of course in many respects the project management of an educational program is different from project management in a production process.

The concept phase

During the concept phase, the principal features of the project had to be defined. A preliminary risk evaluation was conducted to establish whether the project was feasible and as a result it was decided to continue with the project submitting a preliminary action plan to the Faculty board. The risk factors revealed were as follows:

- There was no distinction between consumer and supplier since the academic organization preferred to manage the entire project and to entrust internal committees with an evaluation of the feasibility of a new educational project.
- The proposal to start an online project came from a small group of faculty members who then had the role of sponsors. These sponsors were biased towards the beneficial aspects of the initiative and they tended to underestimate risks and difficulties.

A realistic evaluation of the project was very difficult and the decision to start the project required a thorough needs analysis. It was necessary to consider not only the needs of the organization but the real, costs and the impact of the new educational project on the economic and social context.
To reduce the risks found we carried out a needs analysis, combined with a Total Quality Management approach.

We distinguish between two aspects of the needs assessment process:

- *Analysis of the external needs*, addressing questions about the social conditions the program is intended to improve. The principal steps in this analysis are (Rossi et al. 2004):
  - description of the target population and service environment;
  - needs identification of the target population;
  - needs assessment to produce recommendations for action;
  - communication of the results.

- *Analysis of the internal needs*, where problems and benefits for the academic organization, and issues for teaching processes, have to be examined. The principal steps are:
  - description of the various parts of the academic organization involved in the program;
  - identification of the technological and teaching needs;
  - preparation of documents for decision-makers.

Different actions and tools can be used to tackle these two kinds of needs. For the external needs analysis in the context of our academic eLearning program, we considered:

1. Selected statistical data and social indicators to identify target populations and social needs in the university learning field (e.g., demographic characteristics, geographical dispersion,

university and scholastic drop out and readmission rates, social, cultural and economic indicators for the geographical area of interest).
2. Sample surveys using questionnaires to evaluate the need for new on-line services in the university student population.
3. Contacts with local agencies, local authorities and secondary school personnel to identify specific needs in the learning field.

The aim of these activities was to identify the social problems to be addressed and to estimate the size of the potential target population. These results were in a report was the basis for developing a "*vision*", and the curriculum (Levy 2003) of this new on-line BSc degree program, and to define some characteristics of the services needed in the area.

The analysis of internal needs was performed using information chiefly from academic personnel, and students currently enrolled in traditional programs. The results were summarized in a document in which the benefits for the university in starting this eLearning project were indicated, as well as some potential difficulties. This document was submitted to the university for approval. Table 1 summarizes the principal steps, tools and outputs of the needs analysis.

Table 1. Needs analysis.

	External needs	Internal needs
Steps	Target population. Need identification. Need assessment. Communication.	Academic organization description. Technological and didactic needs. Communication.
Tools	Statistical data. Sample survey. Consultation of public agencies, political and local authorities.	Key informants interviews. Focus group. Qualitative descriptions of the principal processes taking place.
Outputs	Report describing the social needs, target population and program curriculum in relation to the social context.	Document describing the vision and the structure of the program to submit to academic decision makers.

The needs analysis related to the setting up of our eLearning *program* led to the following conclusions:

- The proposed eLearning BSc degree program had to be accredited as a traditional degree program by the national accrediting body. This issue required some restrictions of the curriculum and program structure in order to pass the accrediting procedure.
- The online program was a pilot program aimed at a restricted group of students living principally in Sicily. The purpose was to test the feasibility of setting up online programs in the context of an Italian university before extending it to a larger population.
- The proximal outcomes looked at the academic organization of the university and its capacity to manage an online program and the setting up of new procedures.
- The distal outcomes looked not only at students but also public and private organizations interested in the program curriculum.
- Issues of quality had to be considered during all phases of the project management process. Specific processes and procedures had to be planned to monitor and measure the quality issues of the project and improve on them.
- The principal objectives of the project were:
    - to set up an eLearning environment where technological and methodological aspects are integrated using an approach for processes;
    - to create a favourable atmosphere within the academic organization for the transition from a lecture hours/contact hours teaching allocation and evaluation schema (timetable

oriented organization), towards a student centred/quality oriented vision;
- to select qualitative and quantitative tools for assessing the various processes; to develop online teaching practices within the faculty.

The concept phase ended with the production of two documents (see Table 1): one describing the results of the needs analysis and the other to submit to the Faculty Board. In the latter document the general educational objectives of the eLearning program were summarized and the request to proceed was formulated.

The development phase

The development phase had three particular objectives:

- To prepare a document to present to the national accreditation board.
- To define a map of services in order to prepare the Work Breakdown Structure (WBS);
- To establish the principal processes and procedures for a quality assurance plan.

During this phase a project team was created to examine some critical points in the project. The team worked on the following issues, using the results of the needs analysis:

- Definition of the BSc degree curriculum, in view also of the regulations of the Italian Ministry of Education, University and Research (MIUR) regarding the introduction of new bachelor degree programs.
- Identification of online services needed in order to produce a high quality program.
- Definition of the technological architecture for delivering the program.
- Definition of some methodological characteristics of the online teaching activities.

The team prepared the proposal to submit to the national committee. This document summarized the social and teaching aspects that the online degree program would address, and the proposed curriculum. But, the team also worked on other aspects of the project; in particular, it defined the necessary steps, processes and procedures, in order to conform to project management and total quality management approaches.

Three workgroups were set up and a deadline was fixed for the completion of this phase of development:

- The technologies workgroup: worked on defining the online services to design and implement the eLearning environment; the group also examined the principal distance learning standards.
- The methodologies workgroup: worked on the instructional aspects, with particular attention to the quality of both the interactions between the program participants and the content.
- The organizational workgroup: considered how the current academic organization could satisfy the needs of the new program.

The structure of the different workgroups was not very rigid and there was an exchange of experiences and opinions among the groups. Meetings were held to discuss particular aspects of the project with the stakeholders and to study various “use cases”.

This work took three months and produced the following documents:

- Description of Bsc degree program;
- WBS to manage project development;
- services and processes map;
- Service Level Agreement;
- educational contract;
- communications plan to publicize the eLearning program within the university.

Figure 1 summarizes the principal documents produced during this phase: the rectangular boxes represent the documents, on the top of the boxes are written the producers; the ovals represent the decision makers in charge of approving the document; the label "To be approved" indicates that the documents must be approved.

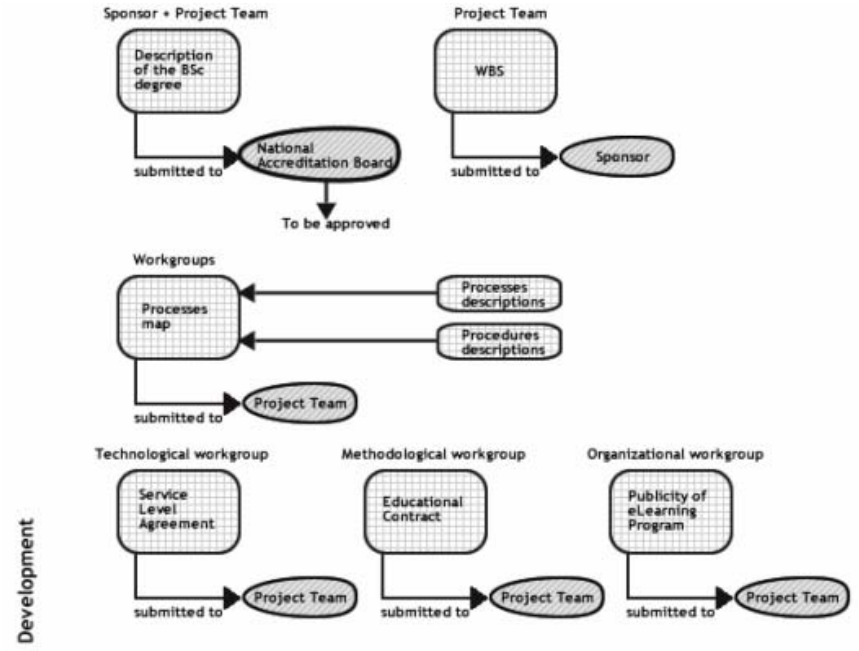

Figure 1. Development phase documents.

Figure 2 shows the map of the principal services and corresponding processes: some processes appear more complex and involve different groups, like for example the content management, the synchronous interactions and the scaffolding of instruction. These processes need to be described in detail since they appear particularly critical in determining the quality of the entire program.

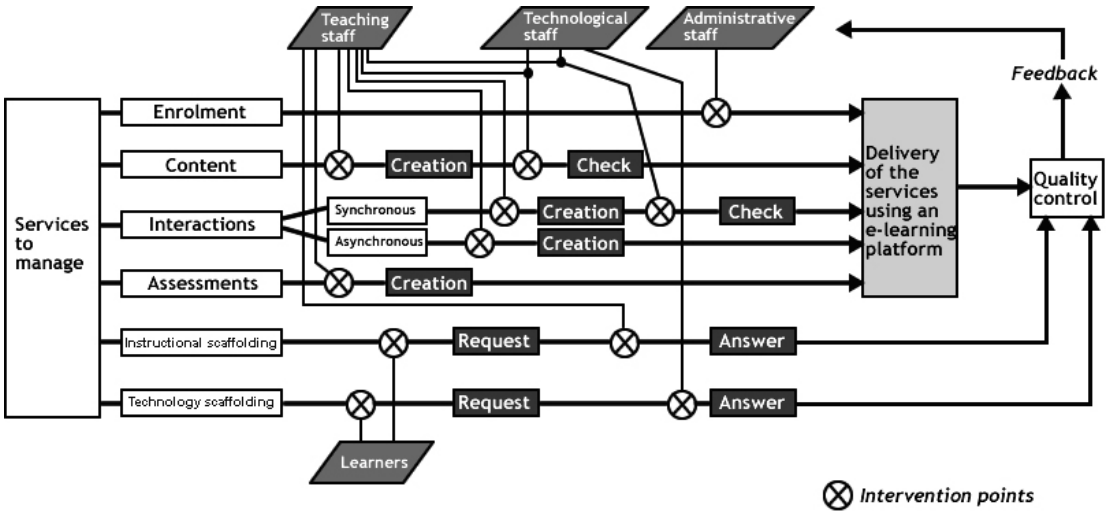

Figure 2. A simplified version of the processes map.

The various workgroups were invited to use a process approach to describe their activities; this also permitted a project management plan based on quality improvement. The quality assurance approach required a description of the various processes using a common scheme, so we decided to adopt the scheme shown in Table 2. As an example we show the description of the process which led to content preparation. In this example, we have identified two sub-processes: "Content creation" and "Content checking". The person responsible for the entire process is the "teacher", and this role can be distinguished from the "author", who is responsible only for the content creation.

Table 2. Scheme to describe a process.

Name: Content preparation		***ID***: C1	***Person in charge***: Teacher
Sub-processes	***Name***: Content creation	***ID***: C1/1	***Person in charge***: Author
	Name: Content checking	***ID***: C1/2	***Person in charge***: Teacher
Inputs	Learning materials (learning objects)	***From process***: Standardization of the learning materials	
	Assessment results	***From process***: Evaluation of assessments	
	Scaffolding results	***From process***: Instructional scaffolding	
Outputs	Content	***To process***: Contents delivery	
	Content	***To process***: Standardization of the learning materials	
Measures	Technological conformity: links functionality; multimedia contents functionality (see *Manual on content delivery*). Instructional conformity: clear learning objectives; clear organization of the content; presence of self-evaluation assessments (see *educational contract*).		
Risks	Bad technological functionality; no clear instructional organization.		
Stakeholders	Students; author; teacher; tutors; all teachers involved in similar activities; technological staff.		
Weight	Very high.		
Comments			

The inputs shown in the scheme are the outputs of other processes. The outputs of a process are sent, as inputs, to other processes. The measures establish the quality of the outputs and they can be both qualitative or quantitative; reference may be made to some specific document where the quality standards have been defined. The risks indicate the most critical factors that may affect the results of the process. The stakeholders are all the people who have an interest in the outputs of this process. Finally, the weight is a measure of the total impact of this process on the quality of the eLearning program.

In Table 3 we show the scheme for the two sub-processes involved. Note how these two sub-processes are in line, one after another, so the output of the first process is the input of the second.

This is an exception; in fact, generally we have different processes in parallel and the results of the entire process can depend on the execution of all these sub-processes. This usually has a huge impact on the time management of the principal process.

Table 3. Schema to describe the sub-process "Content creation".

Name: Content creation		***ID***: C1/1	***Person in charge***: Author
Inputs	Learning materials (learning objects)	***From process***: Standardization of the learning materials	
	Assessment results	***From process***: Evaluation of assessments	
	Scaffolding results	***From process***: Didactic scaffolding	
Outputs	Content	***To process***: Contents checking	
Measures			
Risks	Incorrect use of the authoring tool.		
Stakeholders	Author; teacher.		
Weight	High.		
Comments			

Table 4. Schema to describe the sub-process "Content checking".

Name: Content checking		***ID***: C1/2	***Person in charge***: Teacher
Inputs	Content	***From process***: Content creation	
Outputs	Content	***To process***: Contents delivery	
	Content	***To process***: Standardization of the learning materials	
Measures	Technological conformity: links functionality; multimedia contents functionality (see *Manual on Content delivery*). Didactic conformity: clear didactic objectives; clear organization of the content; presence of self-evaluation assessments (see *Didactic contract*).		
Risks	Bad technological functionality; no clear didactic organization.		
Stakeholders	Students; author; teacher; tutors; all teachers involved in similar activities; technological staff.		
Weight	Very high.		
Comments			

In Table 4 it is easy to see how the sub-process "Content checking" can have a big impact on the quality of the whole eLearning program. This sub-process must be monitored very carefully.

The scheme presented here is general enough to describe all the processes involved in an eLearning program. Moreover, in an eLearning program, quality control cannot be exclusively based on a simple process approach and cannot be guaranteed only by good project management. After the planning phase it is important to define some quality indicators which must be monitored during the entire delivery phase. It can also be useful to perform periodic sample surveys to test the satisfaction of all the stakeholders: students, teachers, private and public entities, and academic organizations.

An eLearning program can be assessed only over a period of time and the project management should not be terminated after the testing of the eLearning infrastructure. Therefore, we decided to set up a specific structure devoted to quality improvement. The function of this structure is to control all the quality indicators from the different processes and to suggest interventions to the people responsible for the processes. Automatic checking and alerting tools can also be used.

In the quality control process, only measurable variables were considered, through the uninterrupted examination of the outputs of the other processes. For example, in regards to instructional processes, we invited the teachers to describe the main steps of their activities in a public document. In this document they had to establish, for example, the type, number and timetabling of the assessment tests to be

administered during the program. The quality control group would then check whether these tests were administered to the students as agreed, and if not, the team would remind the teacher to act according to the plan. In this procedure the teacher is solely responsible for the instructional process, but the process can also be checked by the quality control group.

The implementation and project completion phases

The final part of the project consisted of implementation and project completion. The implementation phase was primarily a technological task, so we have not analyzed it for this chapter. Instead, want to say a few words about the completion phase of the project.

Deciding when an eLearning project is complete is not as simple as it might appear. This problem is common in all projects dedicated to setting up a service, rather than a product. In many cases, and in learning services in particular, having the right technological functionality is not sufficient to declare the project closed. During the delivery of a service, or eLearning program, new problems can unexpectedly arise and unpredicted behaviours can compromise the efficacy and efficiency of the entire program. Generally these occurrences do not stop the program; it continues to work but its quality may deteriorate. The consequences of this situation are particularly serious in a university program because it lasts for three years and poor results in any particular program can affect the results in related programs, and, therefore, the final outcome.

A university degree is essential for entering many professions and performing specialized jobs: a university program of poor quality can introduce inadequately prepared graduates into society, be they doctors, teachers, or engineers. We therefore decided to extend the project beyond the testing phase of the infrastructure and consider also the first three years in which the degree program was effective. Further actions were taken in this period to improve the quality of the various processes, procedures and services. We had to develop new tools to support the evaluation of the program. We prepared questionnaires and submitted them to the students, teachers and other stakeholders for validation.

Conclusions.

In this chapter we have examined the first three years of an eLearning BSc degree program carried out by the Faculty of Science of Palermo University, an Italian state university.

We would like to summarize some lessons learned from this experience. First, to ensure the quality of an eLearning program it is useful to plan well defined procedures and to describe them in detail. It is important to establish who is in charge of the various processes, to establish measures and assessment procedures for these processes, and to foresee the most likely risks in each of them.

But, unfortunately this is not always possible. This may be the case, for example, in very complex tasks in which different competencies are involved. A typical case is the web contents development process where technicians and instructional designers approach problems in very different ways and the interaction between their different perspectives can give rise to serious difficulties.

We decided to adopt a collaborative approach to avoid these problems. We selected a small group of teachers who had expertise in Web technologies, and invited them to collaborate with expert technologists for designing some pilot courses on specific topics needed for the curriculum. The work of these “pioneers” was then used by other teachers as a reference point for preparing their material, and the more expert colleagues were asked to give advice and help.

This approach had two other advantages: it permitted some courses to be prepared very quickly and it resulted in a degree of consistency among the different course designs so that instructional design was not restricted to each course author.

Interactions with the administration of traditional academic organizations is another potential source of friction. Generally, the bureaucratic academic structure is not prepared to support an eLearning program in an efficient manner. eLearning often requires changes in the existing ways of operating and evaluating instructional processes and organizations are often not ready to accept such changes.

The complete re-organization of university structures is a very complex task that requires much time and expense. Because of this, we planned and set up a parallel administrative

structure to manage these services independently of the academic structure.

Finally, there is the issue of costs. The technological costs needed to set up the learning platform are not particularly high. Many open source platforms are now available and the basic technological infrastructures and competencies are already present in the academic organization. Content management and teacher training may involve some expense but, in our case, we encountered great enthusiasm from the faculty in participating in the online degree.

Further costs that need to be taken into account include setting up a scaffolding structure composed of technological staff and instructors, and for maintaining the technological infrastructure. These costs vary according to the number of students enrolled on the program.

To declare the project finished it was necessary to check off the following:

- all the principal processes have been described and the functionality has been tested during the delivery phase;
- all the programs have been prepared, loaded on the learning platform and distributed online;
- timetables are being respected and the students are following the programs regularly, taking exams with satisfactory results;
- a system for controlling the quality requirements has been set up and is working;
- the budget has been followed;
- the evaluation procedures for the various processes are working regularly, data is collected, examined and assessed periodically;
- the levels of student satisfaction, success and drop-out rates are measured;
- the academic organization is evolving towards new standards and more positive attitudes to eLearning management.

The project was completed when the team was satisfied with all the above items.

This is a beginning. The challenge of setting up eLearning can't wait for new cohorts of students. The new generation is different from traditional students, and demands that such educational innovations be in place. In the near future universities will be measured not only on their classroom based programs but also on the quality of their eLearning offerings.

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Chapter 18

A successful vendor relationship for a large-scale laptop program at Ryerson University

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Abstract: The authors of this chapter describe the process of initiating and implementing a large scale laptop program at a Canadian university. The process included finding an appropriate and supportive vendor, and working out an arrangement that worked for all stakeholders. Implementation issues and lessons learned from this project are also presented.

Key words: Laptops, Learning management systems, procurement process, vendor relations

The fast pace of technology development has had a large and important influence on the development of innovative approaches to educational delivery systems. According to Al Hashim et al. (2003), technology use in the classroom has progressed over the years from flip chart and easel to the use of sophisticated audio visual technologies and techniques. Technology use in the classroom for teaching and learning began in earnest with the advent of the microcomputer and more usable software applications such as Microsoft PowerPoint and web-based learning content management systems such as ATutor, WebCT™ and Blackboard™.

Considerable research has been carried out on the influences of hardware resources in the teaching and learning environment (Demb et al., 2004; Landry, 2000; Twigg, 2000). The design of personal computers (PCs), peripherals and networking environments that support complex educational systems are important enablers of the technology change process (Al Hashim et al., 2003). Carswell and Venkatesh (2002) argue that faster and more economical computing power, high-speed communications networks, and the standardized, interoperable software and communications technologies manifested by the World Wide Web provide ways to link diverse locations to produce powerful virtual learning environments. In addition, the development of powerful and relatively inexpensive laptop computer hardware and wireless communication networks have made student-owned and portable hardware for individualized technology-enabled learning and approaches feasible.

A vital aspect of the laptop approach to technology-enabled learning is to understand how the hardware is deployed and used, and the advantages and disadvantages of these models. Landry et al., (2000) identify three main models of laptop deployment at the university or college level: 1) concentrated (students provide own laptop); 2) borrowed from university; and 3) leased (student pays for university specified leased laptop.

Each model has potential implications for instructional benefits, ease of implementation, cost savings and impact on the project management for procuring and implementing an e-learning program. For many schools, the primary advantages of laptops over desktops commonly reported in the literature is in creating opportunities for all students and instructors to have constant access to computing resources due to the portability of the hardware

and a wireless network infrastructure (Landry et al., 2000; IBM, n.d.; Tarca, 2004). Many universities and colleges are embarking on initiatives to include laptop computers in their program in order to address competitive forces in the marketplace.

The process of laptop acquisition and deployment in education settings is unique in many ways, including the size of the projects, the way in which laptops are used and the ownership models that can be considered. Project management techniques can inform and assist these undertakings, particularly in specification and deployment processes.

In this area of procurement, academia may deviate from traditional private sector practices. There is, in almost all cases in the public sector, a very high premium on transparency in purchasing transactions and, a focus on process compliance over speed or effectiveness. While much has been written on sustainable private-public sector partnerships (e.g. Hodge, 2004) and project partnering strategies (Hampson, Peters & Walker, 2002) as possible methods to address some of these issues, very little in the current literature seemed able to guide us on best practices in the educational sector to meet our project and purchasing needs. Therefore, the project team set out with an objective to develop a new model of partnership with IBM, the successful vendor for Ryerson's School of Information Technology Management (ITM) *Learning Edge* laptop program.

We will present a detailed description of this partnership model that has evolved between ITM and IBM as a two phase process in the ITM laptop deployment at Ryerson University. Particular emphasis will be placed on the role and contribution of the vendor to the successes and lessons learned in the project. We also suggest that it could be used as a model for laptop program/project management in other institutions regardless of hardware vendor.

ITM Learning Edge Project

Description

In 2001, Ryerson University and ITM undertook the planning process to initiate the ITM *Learning Edge* program. In this program (see http://www.ryerson.ca/~dle/), students use a leased laptop and the Blackboard course management software for much of their classroom learning and computing activities. All mandatory course software such as office productivity, statistics packages, compilers, database development tools, and multimedia software are supplied with the laptops. Instructors also use the same environment to deliver the curriculum.

In this program, the procurement and deployment activities were divided in two phases of one project: 1) procurement including initial delivery and support; and 2) renewal of hardware and software after two years of leasing. The first phase consisted of the initial specification, procurement, deployment and support of 350 laptops and software, one for each student entering ITM in their first year, for September 2002. This process constituted the model for deployment of laptops for all first year students entering the program in following years. The process of vendor selection is described in the Analysis section of this chapter.

The second phase of the project consisted of developing and executing a model for replacing the laptops every two years. The first replacement exercise occurred in September 2004 where 350 original laptops were replaced with new models for third year students, and 472 new laptops were delivered to incoming first-year students.

Method

Seven individuals, constituting most of the procurement and implementation teams of the ITM *Learning Edge* program, participated in interviews. These individuals consisted of: the chair of the procurement committee and the chair of the School of ITM at the time, the associate chair of ITM (both representing the university administration), the project consultant, the student representative, the manager of the technical staff and lead technical liaison between the university and the vendor for the project, the help desk manager and a representative spokesperson from the vendor.

Each individual was asked to comment on a specific set of questions regarding his/her role in the project, the process for both phases of the project from his or her point of view, successes and weaknesses, and his/her expectations of the vendor for both phases of the project and whether those expectations were met.

Analysis

Analysis of the interview responses revealed seven main categories of commentary. These included statements about: goals and vision, the selection process itself, vendor behaviour and

attitudes, team behaviour and attitudes, weaknesses, strengths, and differences between business and education environments. We present a summary of this commentary and attempt to provide some practical outcomes and suggestions in using this approach for project management.

Phase I: Procurement process

Initially student participation was limited, but after considerable public display of discontent and a formal request by the academic governing body of the university, one student representative was elected to the procurement committee and a formal study of student opinions and needs was carried out.

All of the participants from the university including the consultant and the student representative outlined the goals of the project and the vision they had for the Learning Edge program. The main goal or vision that provided a framework for phase one of the project was that ITM required a program that was technically superior to any other, particularly since it was an IT school. As one person stated "we had to have the best computer at the lowest price." Also, people agreed that the goals of improving and supporting effective teaching and learning were important and that the program must be pedagogically justified, otherwise it was not worthwhile.

The procurement process at Ryerson involved a combination of private and public sector practices. Initially a very detailed set of specifications was designed by Ryerson with no input from potential vendors. These specifications and the process of publishing them for vendors required approval from many different levels of administration.

This stringent protocol and approval process was implemented so that the process was seen to be impartial, objective and transparent - a public sector approach to procurement. All vendors and team members had access to the specification documents delivered simultaneously as a Request for Proposal (RFP). The successful vendor commented that often they are engaged to assist in determining the specifications for business but in this case the specification process was carried out without vendor assistance.

Each vendor submitted a response to the RFP and these responses were opened simultaneously by the committee, similar to the RFP process in the public and private sectors. Each vendor was then invited to deliver a presentation on their submissions. Following these presentations, a short list was generated.

At this point, the process deviated significantly from the public sector process because a new set of specifications was generated based on a collection of best options offered by each vendor in their first submission. Short-listed vendors were then asked to re-submit their proposals based on this new specification. At this time, Ryerson team members entered into discussions with vendors regarding their optimal configurations and support offerings. The successful vendor and most of the team members mentioned that the hardware configuration derived for this second stage was unique and not offered by any one vendor at the time. For the successful vendor, this hardware configuration became their standard university model.

A response to the new specification was presented by each short-listed vendor and one vendor, IBM, was awarded the contract. This selection process followed a typical weighted criteria approach used in the public and private sector procurement process. The vendor and seasoned team experts in the procurement process (chair of the committee and the consultant) observed that this two stage process substantially enhanced the vendor relationship.

The successful vendor became much more involved in the specific negotiation process, even assisting the Ryerson team in crafting purchase orders so that they were accurate and complete. In fact, the vendor mentioned that this part of the process was very unique to them, and it was as if "one member of the Ryerson team 'moved-in' with the vendor for two weeks" to finalize the project. The vendor and the Ryerson team then packaged and distributed 350 computers in the first phase of the project. The vendor also ensured that personnel at Ryerson were familiarized with all entities of their supply chain management system before beginning the receiving and distribution activities. This strategy ensured that Ryerson personnel could trouble-shoot difficulties with any supply chain component directly without waiting for the vendor's intervention.

Implementation Issues

One of the most striking set of comments made about this project was the difference in approaches between educational and business

projects. All participants including the student member and the vendor suggested that an educational environment is very different from a business environment. In business environments, the computer hardware is the focus of the procurement process. The business "owns" the hardware and is responsible for managing their resources. The "company" computing resources are used by employees to carry out work tasks assigned by and for the company. If an employee loses a system, they are not usually responsible for replacing it.

In contrast, at Ryerson, students lease their laptop computer but are still responsible for its upkeep and well-being. If a student loses or incurs damage to her laptop, she is responsible for replacing it. Separate insurance is available for situations where the hardware becomes damaged or stolen. An important consideration is the model that can be offered in this situation. The initial model used at Ryerson was a vendor-supplied insurance program. However, over time this has evolved to a Ryerson-insurance program.

Students use their laptops for many different purposes, ranging from work that is assigned by different instructors to tasks that are only indirectly related to their learning such as socializing, and carrying out part-time work such as web design. Assignments given by course instructors can be very general in nature and the student must define specific tasks in order to achieve the generic assignment objectives. This may involve using a wide variety of different computing resources over short periods of time. For example, students may be required to use high end multimedia software such as Adobe Premiere in the same thirteen week period as they use Visual Basic.Net to learn programming. Over short periods of time, use patterns and student needs for computing resources change dramatically. The laptop computing resources must be current and support structures must change with these varying and sometimes unpredictable demands.

Most student work has a time-critical component to it. Assignments, exams and tests, and projects have definite and unmovable timelines. Computing resources must be extraordinarily reliable and function without fail. Failure to function properly at critical times such as during exams or when major assignments are due can result in unfair and stressful situations for students causing frustration and potential for financial hardship. If hardware constantly fails and technical supports are inadequate, students cannot rely on their computing resources and will not trust the vendor regardless of where the fault lies.

This has serious implications for future acquisitions. For instance, education institutions may be hesitant to engage the ongoing use of laptops. Also, students entering the marketplace as an Information Technology advisor or purchaser will be less inclined to support the product based on past experiences.
As a result of these differences, vendor involvement in the procurement process is not solely to supply hardware. Support systems must be put in place by vendors and the educational institution must recognize these unique situations and have strategies to manage them. At Ryerson, no student is penalized for hardware failures and backup computer inventories are maintained so that students can exchange a dysfunctional computer for a working one within a very short turn-around time. However, that still does not alleviate the stress and hardship caused by computer failures during important times such as exams.

Other important vendor contributions to the implementation process were to streamline the hardware preparation and distribution logistics. Software images were tested by IBM for reliability and completeness. Once all parties were satisfied with the image, IBM carried out a bulk image at their facility for all student laptops. They also were provided with incoming student information that was assigned to each computer at IBM prior to distribution to Ryerson students at the university. The secure database they established was shared with the university and became a common document with which to provide support services between Ryerson and IBM. The vendor also participated in the laptop distribution and orientation sessions at the university where students were informed of their responsibilities for the equipment and then issued with their computers.

Another interesting component of the distribution logistics was that IBM worked with the Ryerson team to implement more environmentally friendly packaging. Computers were delivered to the university on skids, shrink-wrapped in a styrofoam wrapper, eliminating excess protective packaging.
Finally, the vendor provided inventory management. Few replacement computers were stored at the Ryerson Helpdesk facility. During

the exchange of old computers for replacements after the second year of the lease, computers are immediately delivered to IBM.

Phase 2 – Transition

In the second phase of the project, the laptops were to be replaced with newer ones after two years. In this phase, the vendor participated in generating the specifications for the hardware. They also asked that Ryerson provide input into any emergent expectations prior to the specification stage of the transition process.

As in the initial phase, distribution logistics were managed by the vendor and the Ryerson team collaboratively similar to the process in the first phase of the project. Only this time, there were 750 computers in-coming (400 new ones going to first year students and 350 replacements for third year students) and 350 outgoing to track and manage increasing the potential for error. The packaging was re-used for the outgoing equipment.

The Ryerson support manager and the IBM representative reported that on-going telephone and email support has provided Ryerson with a smooth transition process and few difficulties that could not be resolved at Ryerson. The vendor was instrumental in ensuring that Ryerson had the resources and knowledge to manage this transition effectively.

Weaknesses of project

Two major weaknesses were identified in phase one of the project. The first weakness was the lack of support for the faculty and instructors. Neither the vendor nor the university had plans on how to assist instructors in designing their course plans, materials and management to migrate to the new teaching and learning environment. Expertise in this area was definitely lacking although the university was equipped to assist with class management issues and some general instructional design pointers. As ITM was the first school at the university to begin using laptops, the university had no experience with this element of teaching. It should be incumbent on vendors to offer faculty training assistance for new implementations. Subject matter experts, instructional designers or instructors with experience in successful planning and delivering of laptop courses, should be made available to education institutions during transition periods.

The second weakness was the vendor's inability to manage expectations and follow through on the added value commitments made during the procurement phase, particularly for students. Commitments regarding student co-op placements and employment, support for research, and other educationally related commitments did not materialize. Again, this may be a function of the lack of experience with educational settings and understanding how the needs of educational organizations are different from those of a business environment. However, it caused some disappointment and disgruntlement even though the hardware deployment and distribution logistics were well managed and supported by the vendor. Vendor performance must be tracked and they must be held to account formally for added value commitments made during the procurement process.

Budget

Thirteen Ryerson staff and students and six IBM staff were involved in the deployment part of the first phase of the project (duration of approximately two months). Project costs in the first phase of the project were: $839,677 for hardware, $13,400 for human resources, and $659,500 for building, network and services upgrades. For the second phase, nine Ryerson staff and five IBM staff were involved. The budget for the second phase was $1.38M for hardware and $7,956 for human resources for the two month planning and turn-around period.

One of the unique aspects of the Ryerson model was student employment in the support service and the distribution of computers. This resulted in relatively low human resources costs while allowing students to gain experience and expertise with providing computer support services. However, student turnover may result in difficulties with providing consistent and continuous support over time. A full time technical lead and human resource management is required to provide continuity, training and expertise.

Lessons Learned – A summary

Ryerson administration and the Learning Edge team quickly realized that in order for the project to be successful, all procurement and support systems must be transparent, open, and fair. All stakeholders including students must be invited to participate. In a risk adverse environment such as Ryerson University and according to the literature, this meant a very strict process of specification drafting by the university, and a formal RFP, bid and selection

process (Walker, Hapson, & Peters, 2002). However, the procurement team also recognized the need to enter into negotiations if they were to achieve the goal of acquiring the "best computer for the lowest price."

Combining a stringent public sector process with a more flexible private sector process resulted in a new hybrid model as illustrated in Figure 1 and allowed the team to achieve this goal. This model capitalized on the best bargaining features of the public and private sector processes in a manner that addresses the challenges, needs and expectations of a risk-averse educational organization. We suggest then that this laptop procurement model is one that could be considered by other educational institutions.

A laptop program is a long term investment by a university that involves a large scale hardware acquisition along with all of the associated software and support issues. It also involves infrastructure upgrades, and a re-examination of the teaching approach in classes. Vendor commitment to and participation in this process is very important particularly for institutions with little or no experience in large scale and long term procurement and deployment projects and programs. We believe that IBM is especially skilled and experienced with negotiating hardware configurations and appropriate pricing structures, assisting in establishing support services and distribution protocols, and supply management. Universities must ensure that all of these advantages are part of the negotiation process.

Vendors such as IBM are less experienced and able to support the pedagogical and teaching needs that are also part of the laptop project such as the Learning Edge. For example, vendors should be able to provide educationally appropriate elements such as student employment, research funding and special appearances in classes. Vendors should also provide assistance to faculty in learning new techniques for managing and teaching classes in laptop environments. Care must be taken and extensive research carried out by negotiating teams to truly understand the extent to which vendors can provide this type of support, and then manage expectations appropriately.

Vendor commitments to value-added elements of the project must be formally tracked through reports and progress meetings. Vendors must be accountable for these elements and should be actively engaged in them.

Finally, student assistance (particularly IT students) in the implementation and transition phases of a laptop acquisition project is a highly efficient and effective method. Students are provided with excellent opportunities to learn the various tasks involved (e.g., distribution, training, help desk support). The university is able to maintain a reliable and cost effective service.

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Chapter 19

Evolving a Large Scale Higher Education E-learning Project Management System: Technology Enhanced Learning (TEL) at the University of Saskatchewan

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Abstract: Despite the charge that universities are unnecessarily slow to change structures and processes related to teaching and learning, over the last five years there has been an increased proliferation of e-learning across tertiary education. Now seen as a valid and important alternative to traditional classroom-based methods, institutions of higher education are attempting to increase both the rate and scope of course and program development using ICT tools and technologies. However, such initiatives, especially taken on an institution-wide level, require significant fiscal and human resource investments.

Given that most universities in Canada are under considerable budgetary pressures due to funding cutbacks, deep investment in e-learning from within the institution is likely to be impeded by such constraints. Ironically, forward thinking governments understand that the skills and experience gained by learners using e-learning tools and technologies are critical to the ongoing viability of the knowledge economy (Bloom & Murray, 2001). A viable strategy for any government that wishes to support the products and processes necessary to realize the goals of a knowledge economy is to empower institutions of higher education through targeted funding programs as direct investments in the design and development of e-learning initiatives and innovations. Via an innovative funding program called the *Technology Enhanced Learning (TEL) Action Plan*, the Government of Saskatchewan has supported and encouraged the adoption of e-learning across multiple institutions of higher education in the province. Through an examination of TEL at the University of Saskatchewan, this chapter will document the macro-level project management structures, issues, problems and solutions, and cumulative lessons learned from the implementation of this initiative.

Key words: Technology-enhanced learning, faculty subject matter experts, higher education/tertiary education, integrated/strategic planning, project teams/management, cooperative vs. collaborative models of project management, continuous improvement

In the year 2000, the Saskatchewan Government, through its department of education, *Saskatchewan Learning*, initiated a province-wide funding program aimed at stimulating the development and implementation of technology enhanced learning across the spectrum of its educational institutions. In addition to funding targeted for the K-12 sector, separate funding envelopes were made available to the province's tertiary education institutions, including the University of Saskatchewan, the University of Regina, and the Saskatchewan Institute of Applied Sciences and Technology (SIAST). While the institutions naturally welcomed the

initiative and the associated funding support, TEL presented significant project management challenges due to the scope and novelty of the initiative, as well as the diverse constituencies involved. In this case study, the focus will be with the experiences of the University of Saskatchewan (U of S) with TEL.

In the Beginning – 1998-2000

Since 1998, the U of S had received special provincial funding through the *Multi-Media Program Development and Support Fund* (MPDSF) for projects in technology-enhanced learning. This funding was targeted for the development of on-line courses to serve learners at a distance, and included the integration of new approaches to teaching and learning that would accommodate the diverse needs of these learners. It was assumed that information and communication technologies (ICT) would help to make distance irrelevant, both in education and in work, and therefore serve a greater range and number of Saskatchewan's rural and northern population. Finally, the MPDSF program and the projects it supported were seen to encourage the formation of significant partnerships among the post-secondary institutions and with industry.

With the formation in 1997 of a *MPDSF Working Committee*, established to formulate goals, challenges and strategies for the program, the start of a provincial strategy for technology-enhanced learning was underway. The *Department of Post Secondary Education and Skills Training* (PSEST) (now referred to as *Saskatchewan Learning*), in collaboration with Saskatchewan's post-secondary institutions, developed the *Technology Enhanced Learning (TEL) Action Plan*, a five-year strategy that began in 2000-01. As articulated in the Action Plan, the goals of TEL are:

- To develop/retain students, graduates and faculty for a knowledge-based economy
- To advance education and training in rural and northern communities
- To enhance First Nations and Métis peoples' education and training
- To develop Saskatchewan's intellectual capital in information technologies and other niche specialties

Central to the TEL Action Plan was the creation of *Campus Saskatchewan*. Established in June 2002, *Campus Saskatchewan* is an inter-institutional partnership, directed and managed by its members, to support them in developing and advancing collaborative initiatives to achieve shared goals and priorities for technology enhanced learning. (See: http://www.campus.usask.ca for a description of goals and objectives.)

With the establishment of TEL and Campus Saskatchewan, a coherent set of goals, objectives, and support structures was established. Drilling down from these province-wide, inter-institutional initiatives, it is important to note that these aligned well with the University of Saskatchewan's new strategic planning processes and products being developed. Utilizing a number of prerequisite planning documents (e.g., Advantage U of S), the U of S began its *Integrated Planning* process in 2001, one that defines the future direction the institution. This process involves the drawing together of university-wide and unit-specific planning efforts, providing the focal point for institutional decision-making, initiatives and resource allocations. Specific to supporting technology enhanced learning to meet the strategic directions of the University, President MacKinnon states,

> In learning, in particular, we must "capitalize on our expertise in distance learning, and make effective use of new developments in information and communications technology to offer our students courses in new, more flexible formats" (MacKinnon, 2002, p. 9).

A foundational document in support of the Integrated Planning process, namely, the strategic plan for Information and Communications Technology, entitled *Advantage U of S*, underscores the fact that technology plays a large role in learning.

> In the new millennium teaching spaces are virtual as well as physical. Advances in distributed and asynchronous learning promise to enrich the learning experience for both on-campus and off-campus students by extending the traditional classroom. (Bunt, 2003, p. 9).

Clearly, the strategic directions of the U of S endorse a focus on technology-enhanced

learning initiatives on an institutional-wide level. Fortunately, this planning path converged with the Provincial Government's desire to enable and encourage technology-enhanced learning through targeted funding programs such as TEL.

Implementation of TEL at the U of S: The Evolution of a Project Management Approach to E-Learning Development

Phase I: 2000-2001

Following a review of institutional recommendations by the provincial *TEL Steering Committee*, funds were allocated to each institution in March 2001. TEL funding for the U of S totaled $490,000 with $300,000 allocated to content development projects and $190,000 (all amounts in Canadian dollars) allocated to Faculty Development (e.g., WebCT licenses, faculty training, workshops and seminars)

Due to the extremely short planning timelines in the first year of the implementation, a general *Call for Proposals* was not feasible. Instead, an ad-hoc committee was struck to select a small number of pilot courses that would both address TEL goals and fit the strategic plans of the University. The committee was brought together under the direction of the newly appointed AVP ICT, the office responsible for TEL at the U of S from 2001-2004.

Inter-institutional task teams continued their work on defining Arts and Sciences initiatives, which resulted in the final list of courses in May 2001. Academic units and faculty subject matter experts (FSME) were notified in June and July 2001 of their funding allocations, with planning and design begun for most projects in September 2001. During this first year, nine U of S TEL-funded content development projects were approved, with the cost of each project estimated at $30,000 per course. Funds were allocated for faculty release time (to academic departments), for instructional design, copyright clearance, evaluation and coordination (to the Extension Division—ED), and multimedia and web programming (to the Division of Media and Technology—DMT).

In addition to being paid faculty release time, departments received a small amount of funds for administrative overhead. Despite requests for TEL funding specifically allocated for project management, none was given. Instead, the office of the AVP ICT received funding for functions of the *coordination* of TEL activities and administration campus-wide (e.g., committee meetings, processing of transfers, correspondence, etc.). These monies were *not* earmarked for project management per se (e.g., monitoring individual projects), but were used to cover the costs of an administrative assistant to coordinate TEL activities and associated overhead. It is important to note that at this time, there was *no letter of agreement* (LOA) in place, nor was there any system of organized collaboration between the support units (Division of Media and Technology—DMT, Extension Division—ED, and Information Technology Services—ITS). As the institution and its internal partners were relatively inexperienced with e-learning project management on such a grand scale as TEL, the processes for developing on-line courses could not be laid out in any exact form to the participating departments and/or FSMEs.

Phase II: 2001-2002

For this funding year, the TEL funds increased dramatically with the U of S receiving $1.17 million to support the development of content, learner supports and resources, and faculty development. In the spring of 2001, a *TEL Coordinating Committee* (TELCC) was set up to oversee the U of S TEL activities. The TELCC's task was to establish criteria by which to evaluate TEL proposals, and to develop policies, processes and guidelines for TEL projects. The committee was made up of faculty members, instructional designers, multimedia specialists and IT representatives. An official Call for *Letters of Intent* (LOI) was distributed to the campus community resulting in 92 letters received from 11 of 13 colleges, an overwhelming response. The TELCC reviewed the LOIs according to newly developed criteria and approved 27 projects. Contacts were made within each support unit to provide an estimate of the costs involved for these projects. Some courses required simple text conversions (e.g., to HTML), while others necessitated multimedia components that would be expensive to design and produce. Project budgets were based on estimates of direct costs and in-kind contributions. These first estimates were quite crude but during the years to follow improvements in levels of accuracy were realized. As more projects could now be developed, the need for more support in areas such as learner services and faculty development was apparent and was met with an increase in funds allocated.

Phase III: 2002-2003
For this funding year, monies received would total $1.22 million. The *Call for Proposals* was circulated with over 50 LOIs received. The TELCC approved 24 content development projects totaling $800,000. Monies allocated for Learner Services totaled $133,000, and $200,000 for Faculty Development respectively.

In 2002-2003, the institutions were asked to provide a consolidated report to *Saskatchewan Learning* that would include all projects approved from 1998. This was a necessary increase in the amount of administration required for TEL at the U of S. Campus Saskatchewan was also now "on-line" and more inter-institutional committees had been formed, requiring even more administrative resources. During this period, project management of TEL at the U of S appeared to be floundering, with too many projects and too few support people. Despite the strain, patterns of systematic project management were finally beginning to emerge and evolve.

Phase IV: 2003-2005
As the program was ending its five-year cycle, TEL funding saw a slight decrease and provided resources over two years instead of one, ($960,000 for 2003-04, and $920,000 for 2004-2005 respectively). An additional forty projects were slated for development during this funding period. The entire TEL initiative is now under government review, and currently TEL is in somewhat of a transition period pending the outcome of this review. However, there is confidence that the program will continue for at least another five years, if not indefinitely, and the U of S is planning accordingly.

While earlier requests were rejected, as of the funding year 2003-04, the U of S received specific funding for the project management of TEL. Several pockets of TEL activity are taking place on campus and the program now requires a full-time manager overseeing all of this activity. In response, a *project manager* for TEL has been hired. Also, the entire TEL program has been relocated from the AVP's Office, to The Gwenna Moss Teaching & Learning Centre (GMTLC), and is now overseen by the Director of the Centre. In the spring of 2003, the TEL Co-ordinating Committee (TELCC) was replaced by a smaller committee, which included representation from Information Technology Services (ITS), Division of Media and Technology (DMT), Extension Division (ED), the Associate Vice President Information and Communication Technology (AVP ICT), select members of the GMTLC advisory committee, and TEL project manager. The project manager is currently conducting an inventory of all TEL activity at the U of S and, after wide consultation, will begin the process of developing and applying a more concrete project management system. The goal is to have a well-organized project management system in place for the anticipated 2006-2011 funding cycle.

Project Management Lessons Learned

Phase I
Large funding envelopes such as TEL, while a boon to facilitating change and innovation, often cause institutions to initially scramble to organize themselves in any coherent manner. The U of S was no exception. Without adequate lead time, combined with a relative lack of experience with such opportunities, stakeholders interested in developing e-learning projects were faced with an ad hoc approach, and resigned themselves to "learning as we go." Obvious gaps in project management principles included minimal established project selection criteria, vague funding and costing guidelines, somewhat arbitrary production team formations, and elementary centralized governance and accountability structures. It was clear that these gaps needed to be addressed quickly in preparation for the next funding year.

Phase II
It became obvious early on that the success of TEL at the U of S increasingly depended on effective project management strategies. The formation of the TELCC assisted in this regard, especially in the articulation of selection criteria and processes, which, in turn, facilitated rational funding allocations. Structural and production efficiencies were being realized by centralizing services and processes for instructional design, web/multimedia programming, copyright clearance, and project coordination; this also provided a measure of consistency in project development processes. To this end, the U of S continued to assign content development funds to the relevant support units.

Along with the consideration of a project management approach to TEL, it was increasingly apparent that the coordination of the program needed more attention. Logically, with the increase in funding and number of projects being approved and developed came an increase in administration of the program. Another problem was that although teams made

up of representatives from the support units had now been created, the reporting structure and process required was still not transparent. For example, problems with a particular project would eventually reach the TEL coordinator who, in turn, took the concerns to the TELCC. However, the teams had not yet refined their communications and process protocols with one another, and often tried to deal with problems independently. By the time these concerns reached the Office of the Associate Vice President of Information and Communication Technology (VP ICT) and the TEL Coordinator, resources had been used on a project that was not meeting its timelines for completion. In some cases, the Office was now beginning to cancel courses and forwarding requests to departments that remaining funding be returned. Simultaneous with these terminal interventions, attempts were made to assist particular departments in securing a committed content developer in hopes of completing projects. Problems with insufficient oversight, monitoring of status progress reports, and accountability and insufficient developer commitment in some projects, coupled with continued provincial pressure for rapid production turnaround, led to many frustrations and inefficiencies. The AVP IT summed it up best: "This was like trying to design the plane while we were flying it."

After analysis by TELCC, through consultation with teams and associated project personnel, it was concluded that the lack of a *Letter of Agreement* (LOA) (i.e., project charter) designed to increase commitment and accountability, was a root cause of several of the projects falling behind. It was, therefore, important to consider a more detailed agreement that would outline the support of the participating department and describe the connection between the project and the college's plans. In other words, a concrete commitment to the TEL projects from the department heads and Deans was crucial. The TELCC immediately began working on the creation of a LOA. As with any institution of higher education, several sensitive issues, such as intellectual property, right to use, and faculty agreements had to be considered. While many of these meetings ended with more questions than answers, the process continued during this funding year and concluded with an appropriate letter of agreement being crafted.

It is important to note that, while the U of S was learning how to manage TEL "on the fly," *Saskatchewan Learning* (the funder) was continually attempting to refine the process at the provincial level. While this was reasonable it meant that administrators at the U of S were often working in a reactive rather than proactive mode. That being said, this is not likely unusual, as the entire system (i.e., provincial funding agency, educational institutions, and product developers) was being challenged in new ways, and a significant period of time was needed to make adjustments and refine policies, processes and practices.

Phase III

With more than 60 projects now in various stages of development, TEL administrators began noticing a pattern in projects experiencing difficulties. For example, some of the initial projects approved were running short of funding. This initiated the process setting up a contingency account, whereby twenty percent of funds marked for content development, across all approved projects, would now be set aside to shore up projects that were estimated incorrectly. Another chronic problem was the fact that many Faculty Subject Matter Experts (FSMEs) were being overloaded with other academic duties, which, in turn, caused their TEL projects to be put on the "back burner," with concomitant delays in project completion.

It was at this time that a *Letter of Agreement* (LOA) was finalized; the approval of any TEL project now required this document be signed. This allowed the TEL program to ensure that the projects had the full support of the participating departments or colleges. Letters of support from Deans and Department Heads were requested at the Letter of Intent (LOI) stage and at the Letter of Agreement (LOA) stage. The LOA clearly stated that timelines needed to be adhered to or the project would risk having the funding revoked and re-allocated to other TEL Projects. It also indicated that it was the responsibility of the Department Head or Dean to ensure that if a FSME should no longer be able to work on the project, another developer would be assigned. In addition to the above refinements, project teams now became involved earlier in the process (i.e., as soon as the LOIs were received). This allowed teams to meet with developers earlier to discuss their projects in greater detail (e.g., budgeting for the projects, media resources, process expectations, timelines, etc.). Communication and collaboration processes between the team members, and the units they represented, began to function more effectively. Finally, a clear understanding, amongst all players emerged, namely, that any concerns or

problems should be directed to the Office of the AVP in a timely fashion. The TEL Coordinator was formally designated the key contact and began to work more closely with the project teams and faculty members.

Learning by Experience

As the various groups and individuals participating in the TEL initiative at the U of S worked through the assortment of projects and processes, there was a collective learning that took place. Taken together, the institutional collective learned new approaches to managing the process, found solutions to problems encountered, and began to more methodically plan for the design, development, and delivery of e-learning courses and programs. However, while successes have been realized and changes in methods of project management implemented, these have not been without frustration and a sense of "two-steps-forward, one-step-back." In other words, while some aspects of TEL project management have evolved for the better, it is clear that these innovations might have been realized sooner.

Next Steps: Developing a Project Management System for TEL

In addition to tracing the trajectory of TEL at the U of S, and celebrating its successes, including the evolution of structures and processes of project management, it is important to offer some vision of what is needed to catapult the entire endeavor forward. Informed by concrete recommendations (Martin, 2001; Matheos, Dewhirst, & Rowan, 2004), there are a number of steps the U of S can implement toward improving the project management system used for TEL. First and foremost, there needs to be a thorough understanding of what an optimized project management system for TEL would look like, what the basic elements of such a system would include. To realize this end goal, baseline data regarding current and past TEL projects need to be gathered and analyzed to discover what performance gaps exist, and to inform both short-term and long-term project management system goals. It is recommended that these and other project management functions be formalized in a *TEL Project Office*. Advantages of this structure include direct support for the designated project system owner, internal TEL Advisory Committee, and the various project teams. A TEL Project Office can also assist in deploying a system-wide project methodology, provide consultation to project teams, and serve as a centre for excellence on project management. From consultation with project teams, analyses of data gathered from project archives, and continual feedback mechanisms, this office would also develop and provide technical process templates. Continually capturing both technical process and project management best practices will provide an ever-evolving knowledge base for the institution. Ultimately, the implementation of such a meta-level approach to project management will only solidify efficient and effective structures and processes for the development of e-learning projects at the U of S.

Conclusion

TEL has provided great opportunities for the development of e-learning at the University of Saskatchewan, ranging from expanded student access through to transforming teaching and learning within and beyond the institution. In light of both internal and external influences and trends, focusing on extending e-learning is only timely for the institution. The TEL initiative has provided the impetus to develop a strategy for distributed learning that is congruent with the institution's academic agenda. Importantly, TEL has also provided a matrix of challenges and opportunities that together have provided a context in which the institution can learn and change. One concrete outcome of this process has been the evolution of a coherent and well-developed project management system for e-learning. The end result of these collective efforts, namely, the development of a vibrant and innovative e-learning environment, one which results in advancing and improving the teaching and learning enterprise at the U of S, will be the ultimate accomplishment.

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Chapter 20

Barriers and Drivers of University E-Learning Projects – a Case Study of Learn@WU

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Abstract: Due to the university's complexity and diversity, the project management challenges of such projects are gaining more importance in academic research. This paper identifies project barriers and success factors of a large scale university e-learning project (Learn@WU) at Vienna University of Economics and Business Administration. Results from a project audit involving decision makers, academic content providers, pedagogic experts, and IT-technicians are presented to reveal the importance, strategies and challenges of project management in e-learning projects. The case study shows that project management in e-learning projects is dependant on the ability of the project manager to act as negotiator and motivator for continuous stakeholder alignment and fostering of a collaborative culture.

Key words: Project Management, E-Learning, Case Study

According to various researchers (Willcock and Margetts, 1994) IT/IS projects are considered as high risk and challenging projects. The under-management of risks in IS projects is very surprising considering the size of IT expenditure, and the history of disappointed expectations (Keen, 1991; Hochstrasser and Griffiths, 1991; Willcocks, 1994; 1996).

Research by Meta Group (cf. Macpherson et al., 2003) indicates that the overwhelming majority of employers are looking for technologists with business skills. Both workers and employers want IT to become more business-focused. Companies want IT workers to possess business as well as technical skills, while IT professionals reported a desire to broaden their communication, business modelling and project management skills.

This chapter reports the findings of a survey designed to capture the experiences of project management personnel at Learn@WU, a large scale e-learning project at the Vienna University of Economics and Business Administration, which was initiated back in 2000.

E-Learning

E-Learning supports learning through information technology, thereby creating new interaction and communication possibilities, by offering an increased independence of both time and space. Accordingly, an e-learning project deals with design, implementation, and utilisation of a social and information technological system (see e.g. Hoppe and Breitner, 2004). At the centre of such a system is an e-learning application, often called a learning/content management system, which is focused on supporting one or more sub-processes of the educational "value chain", including educational planning, content production or acquisition ('make or buy'), content delivery, assessment/evaluation and certification.

Planning for learning typically involves applications supporting needs analysis (including knowledge, skills and competencies gap analysis), as well as assisting in the

identification of individual and organisational goals (Gunnarsdottir et al., 2004). Content production and acquisition is supported by authoring tools and brokerage platforms for learning resources. Delivery applications support learning in courses, either delivered remotely or held in a classroom. In the assessment and evaluation step, software is applied to support benchmarking of the acquired knowledge, skills and competencies (Seufert, 2001), and to evaluate the quality of the course. In the certification phase, applications like grade-books support administration and reporting functions.

Project Management

'Project management process' has mixed definitions in the project management literature. Baccarini (1999, 29) refer to Shenhar et al. (1997), McCoy (1986) and others define the project management process as controlling project costs, time, and measures of profitability to gain market share through efficiency.

More dynamic and integrative views of project management process can be found in project management literature (cf. Jaafari 2000; Gareis, 1989; Ward, 1999; and Royer, 2000). These authors consider culture, organisation, and other 'soft' factors as additional dimensions which influence project success. They view project members and teams more from an action oriented, interactive perspective in which process is part of and linked to product outcomes. Our view relates to and extends the work of these authors.

The symptoms of project failure are different. Jiang and Klein (2001) identified nine IT/IS project development risks. The first three are project size, application complexity and technology acquisition. Hartman and Ashrafi (2002) reported misunderstood requirements, overly optimistic schedules and budgets, inadequate risk assessment and management. Jiang and Klein (2001) concluded that "each organization will approach the problem according to its culture, but the importance of selling the system still rings loud and clear. Additionally, involvement, training, and support serve as common practice to lower the risks associated with software development projects".

Hartman and Ashrafi (2002) recommend linking the project to corporate business strategy, aligning major stakeholders on key issues, simplifying project controls and metrics, and making sure effective communication and expectation management is maintained throughout the project life. Other studies recommend improving the nature of communication between the parties (Riggle, 2001). All these recommendations mainly aim to get participation and commitment from all the stakeholders in the project.

Research Methodology

A qualitative research approach, particularly case study research, was applied as the key methodology in this study. Qualitative research methods are designed to help researchers understand people and the social and cultural contexts within which they live. Kaplan and Maxwell (1994) argue that the goal of understanding a phenomenon from the point of view of the participants and its particular social and institutional context is largely lost when textual data are quantified. Case study research is the most common qualitative method used in information systems (Orlikowski and Baroudi, 1991; Alavi and Carlson, 1992).
According to Gareis (2004, p. 40), project auditing can be differentiated into two parts - auditing project content and auditing processes. The project management audit serves as an evaluation of the project management process in projects or in programmes.

The focus of our investigation was on the project management of e-learning projects and the challenges of such projects. The data for this research was gathered from 15 structured interviews with the project manager, project team members, and the project coach. Interview data were enhanced by content analysis of project documentation, reports, internal memos and presentations. As well, in the follow-up sessions with our interview partners, we validated our interpretations with them. Additional detailed information about project management competencies was collected by observing meetings between the project owner and the project team. Data were enhanced by structured individual self-assessments of the project representatives using questionnaires.

The project management competence of the project team can be described as knowledge and experience in conflict resolution, facilitating tools and methods, utilising synergies, organisational learning, to design the project management process (Huemann and Hayes, 2003).

The interviews, questionnaires and audit checklists were based on Roland Gareis' (1989)

method of Project and Program Management®. The collected data was analysed and presented to the project core team. Figure 1 provides an overview over the research design: starting with a planning phase, data were collected in several steps, then analysed and finally presented to the project core team.

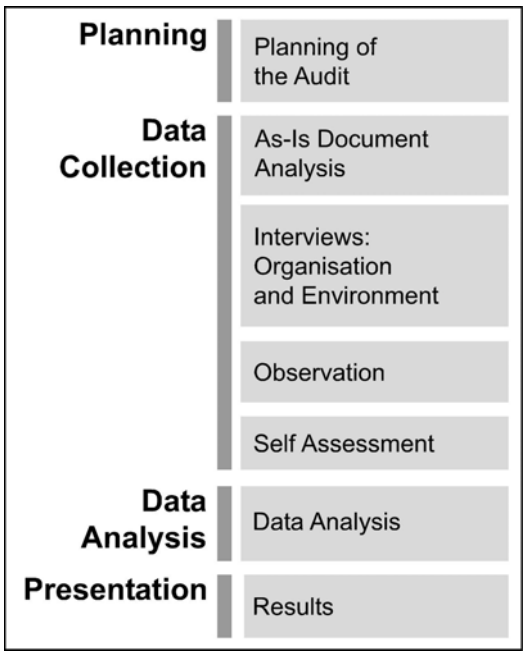

Figure 1: Research Design

The Case of Learn@WU

In this section we introduce the Learn@WU project. With more than 21,000 students, the Vienna University of Economics and Business Administration (WU), is one of the largest business schools in the world. More than 3,800 freshmen enrolled in the winter term 2003/2004 and about 2,000 courses are offered each term. As there are no general selection mechanisms like entrance examinations in Austria, access to the Vienna University of Economics and Business Administration is not restricted, thus traditionally leading to high initial enrolments and sizeable dropout rates as many students fail to pass the courses in the first year. Learn@WU was planned in three phases. This case study reports on the project audit of the first phase, which has been finished in 2003.

Learning Objectives

The primary learning objective was to keep didactic design of learning objects rather open (cf. Alberer et al., 2003), since learning content and learning culture vary extensively across different subject fields like Statistics, English, Marketing, Human Resources, or Law.

Furthermore, several further objectives were defined by a requirements survey carried out among professors and content developers (cf. Alberer et al. 2003). The survey results included enabling computer assisted self-assessment, facilitating downloads of course material, online sample exams, and the offering of online textbooks. Only to a limited degree the survey outcomes showed interest in community and collaboration support.

Project Objectives

In fall 2002, six new degree programs (Business Administration, International Business Administration, Economics, Business and Economics, Business Education and Information Systems) were introduced, replacing the old degree programs. These degree programmes share a common body of knowledge, which accounts for 80% of the courses of the first year. The remaining 20% of the courses are program specific, i.e. learners are taught subjects typical for these programs.

In parallel, an increase in enrolments at the university could be observed, raising the number of freshmen from winter term 2001 to winter term 2002 by nearly one third - from 3,484 to 4,392 students.

The degree programmes all have in common, that they are designed to enable teaching in mass courses in the first year, leaving the regular, intensive interaction with faculty staff to the higher study years. As university access in Austria is not restricted, the idea behind that was to concentrate the high drop-out rates in the first year and shift resources to those who are likely to finish a degree programme.

The Learn@WU project was launched to give learning alternatives to freshmen and to tackle the problem of larger classes by enabling the university to offer ‘mass courses’ in the first year. Thereby, the primary objective of the project was to develop a scalable electronic learning management system capable of serving all freshmen through large scale courses.

Project History

Originally the project was funded by the Austrian Federal Ministry of Science and Culture. With the project starting Fall 2000, the planned launch of the platform was scheduled

for the Fall 2003, but deployment had already started by October 2002.

The initial Project Manager had been involved in a similar e-learning project, where the project management had been outsourced to a leading consulting company. Because his lack of experience, the project manager faced various problems, including acceptance of his authority and his inability to motivate the main subject matter expert in the project. It was quickly concluded that he be replaced by an IT/IS Professor of the university, who was highly accepted by all. Because of this experience, the Steering Committee nominated Professor Gustaf Neumann as the Project Manager of Learn@WU. He had been working with the subject matter expert from the beginning of the project, and his knowledge of the internal rules of the University was invaluable. We will further examine this in the Section Results.

The first project phase was headed by Professor Neumann. At that time 42 staff members (29 full-time equivalents) were employed: there were 36 content developers, 2 educational support staff and 4 IT-technicians. The content developers are primarily experts from fields such as marketing, public law or mathematics. About 3.5 million euros have been invested in the project to date in phase one and two. Workload in the project is highly distributed, and most of the communication takes place via e-mail, except for weekly meetings of the core team.

At the time of writing, Learn@WU had more than 16,000 registered users and holds more than 21,000 learning resources ranging from online textbooks to online exercises. The system encounters up to 3.2 million page impressions per day, making it one of the most heavily used websites in Austria, with web traffic similar to the online portal of the Austrian newspaper www.presse.at (Mendling et al., 2004). In the last 14 days before exams at the beginning of the winter term 2004/05, more than 1.97 million questions were answered online by students, with an average response time from the server of less than 1 second per item.

Results

In this chapter we summarize the results of the analysis of collected data from the project audit:

Project Barriers

Initial interview results reported in Table 1 identify significant barriers to effective team process integration. While many of these process barriers occur in traditional IS/IT Projects, the barriers here are seen as especially problematic, because in the "Internet Age" a barrier that is not quickly removed can rapidly lead to widespread problems, e.g. loss of investor confidence or loss of key employees. The following are some examples of barriers:

- Shifting project priorities affected the motivation of team members.
- Team leaders and members who could not effectively negotiate personal and professional tradeoffs created project and company conflicts.
- Communication across expertise areas (software and hardware engineers, quality assurance, marketing, content developer and technicians) was another major constraining barrier to project management. Part of the communication problem was believed to be the orientation of professionals: type of work, demands, time frames, and working styles: e.g. differences between technical and creative members of the project. The tremendous specialization of roles diminished opportunities for generalists to see and therefore control their entire project cycle. Project owners can be especially disappointed if their projects crash without their input.

Table 5 summarizes the main barriers found in e-learning projects in university settings.

Culture: Integrating technical and creative professionals
Organization: Lack of cross-functional integration
People: Managing motivation, career paths, pride, and egos; responsibility without authority
Strategy: Uncertainty and continuous change
Project leadership: Inexperienced project managers
Methods: Inability to balance discipline and flexibility
Lack of Communication: across expertise areas;
Lack of Input from End Users (students): a focus on product specifications rather than gathering information on usability

Table 5: Common Barriers of E-Learning Projects in Universities

Project Drivers

Several interviewees noted that the project drivers are the reverse of the barriers they identified. That is, it was these specific types of barriers that had motivated the university to

institute the project in the first place. While this may be true, we identified the following additional factors as drivers.

Effective project management is the ability to integrate and support teams as well as to produce results and success. Project teams and leaders who can effectively manage multiple projects in chaotic environments are highly valuable.

A significant motivational factor for team members was being able to learn new technologies and methods. In many corporate projects, stock options and the goal of high income are often reported motivational factors, but in our case the interviewees mentioned 'pride of work' and 'belonging to a winning team' as the most motivating factors. The collaborative positive culture and work environment had also pleased project team members. 'Expressive, fun, team-oriented' are attributes that describe positive projects and cultures. 'Overly technical, missed opportunities' are attributes that describe projects in trouble. Project drivers are summarized in Table 6.

Stakeholder Management: Balanced
Motivation: Maintaining team morale and pride
Learning: Value-added, marketable skills
Communication: Articulating actionable messages and feedback
Negotiation: Ability to respond to project tradeoffs
Coordination: Cross-functional integration on key decisions
Creative Culture: Enthusiasm for 'next step' development, collaborative, fun

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Table 6: Project drivers of E-Learning Projects at Universities

Conclusion

Based on our research, the potential barriers and drivers that can influence the successful management of an e-learning project in higher education are described in this chapter. Our results indicate that an effective and sustainable e-learning project management process is, above all, dependant on the following characteristics and competencies.

First, the ability of the project manager to act as negotiator and motivator is crucial. Project managers need to balance and satisfy shifting demands of investors and project owners in any e-learning project. Success is based on their skills in negotiating conflicting priorities while motivating talented technical and creative professionals, while effectively managing people, processes, technologies and strategies.

Moreover, we highlight the importance of continuous stakeholder alignment and process synchronization throughout the entire project life cycle, thereby linking the strategy and connections of the company/organization with customers, vendors, and suppliers, which in turn, needs to be connected to project schedules, resources, quality assurance procedures, and expected functionality. Managing trade-offs between stakeholder priorities is crucial since projects can affect an entire company/ organization (cf. Yourdon, 2000), demanding alignment or even reengineering of affected business processes and models.

Finally, we observed that successful project management particularly depends on maintaining a collaborative environment – balancing competitiveness, with being open for sustainable change (cf. Devane, 2000).

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Chapter 21

Moving courses online: Return on investment, learner demand, and strategic planning

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Abstract: The Web presents many opportunities to extend learning, improve student success and perhaps even lower costs. The university cost-recovery distance education (DE) unit discussed in this case was under some pressure to move from a primarily print-based course delivery model to an online model. However, moving courses, learning, and services online potentially involved system changes with far reaching effects, particularly with respect to the unit's financial viability. Given the financial risks involved, the unit choose to move slowly into online delivery, and undertook a research project in order to determine which courses and services should be offered online, and at what rate these should be developed. Variables investigated were student demographics and motivations, enrolment and attrition, technology use, and return-on-investment. The case discusses the unique project management challenges encountered in the planning of cost recovery e-courses and services during a period of shifting learner demographics and organizational instability.

Key words: online, demographics, distance education, cost recovery, return on investment, university.

Institutional context

The unit described in this case is located at a large dual-mode university (one that is focused primarily upon face-to-face learning, but also offers distance education courses), and provides the infrastructure for both the development and delivery of the institution's distance education (DE) courses. Three full degree programs comprised of 270 undergraduate courses are offered via five delivery modes: independent study (print-based course materials, often supplemented by audiovisual material), and a limited number of group-based courses (print-based course materials, supplemented by audiovisual materials and audioconference discussions), online courses (entirely net-based), flexible study courses (print-based or online course materials, supplemented by on-campus tutorial sessions), and multi-site virtual classroom courses.

The DE unit provides, at no cost to students, the services of DE student advisors, reference librarians, and exam invigilators, as well as e-mail and toll-free telephone contact with DE staff and instructors. All DE courses have a course website (in WebCT) with course information (e.g., textbooks, details of term work, and academic schedule), course materials, and communication and course management tools. Only in entirely online courses, however, are students *required* to have online access and use the course website for learning activities.

The unit operates on a cost-recovery model with a budget of $4.7m (derived from course tuition), and employs 21 full-time staff and an additional 120 part-time instructors and content specialists. In 2005-06 over 6,000 registrants enrolled in 35,000 credit hours of DE courses offered by this unit.

Introduction

By the year 1999, e-learning was gaining momentum: the literature on online (OL) learning was filled with enthusiasm about the possibilities of highly interactive learning, online community building, shared content, and cost savings. The explosion of the Web as a vehicle

for commerce, communication and learning had the effect of creating a tremendous buzz to put anything and everything online. Our unit was excited by these possibilities, and by the learning enhancements that we anticipated building into our courses. We were also concerned about predictions that students would begin to view our print-based independent study courses as relying on redundant technology, and would therefore flock to online courses at competing institutions, leaving us with declining enrolments and "dinosaur" systems and offerings.

Caution was, however, warranted because much of the research compared the costs of online to face-to-face learning rather than comparing online to other distance education methods (e.g., Bates, 1995; Whalen & Wright, 1998; Arvan, Ory, Burnaska & Hanson, 1998), and significant financial commitment and risk would be involved in expanding our online offerings. Even if we could foresee financing the initial migration of the courses, we were a unit in which independent-study (IS) enrolments comprised almost 90% of our revenue. We knew that we could not afford to make costly changes to our course delivery methods without evidence that our students could, and would, follow. The task was to determine which of our courses and services should be moved online, and at what rate. Our research activities included investigating student demographics, participation and success, and technology use as well as return-on-investment on online and IS offerings.

Challenges presented by changing learner demographics

We had previously gathered data regarding the demographics and motivations of our learners (Wallace, 1999), and had learned that, over the previous 15 years there had been a dramatic shift in the demographics of the DE population at our university as well as at others. In the 1980s, our typical DE student had been a part-time student with full-time work and family responsibilities, living at a geographic distance from the university. In contrast, over half of our students in 1999 were typical urban undergraduates, under the age of 26 years, who worked 20 hours a week in service-sector jobs, and combined on-campus and DE courses. This demographic shift meant that we were now serving a more heterogeneous population. We needed to continue to serve part-time adult learners who were geographically distant, while also serving a new and growing population of young, on-campus, full-time students.

These two identifiable populations presented challenges in moving our courses and services online. Urban students had much greater opportunity to access the Web at lower costs than did truly "distant" learners. For example, while all registered students at our institution had access to on-campus computer labs and a free Internet account, students living outside the city had less access to dial-up, let alone high speed, Internet service, and even when equipment and service were available, often had to pay long distance charges to their ISP. Given that a significant number of our students lived in rural or northern Canada, or were members of the Canadian Forces and their families, stationed worldwide, our planning had to include ways to enhance access as opposed to creating additional barriers to it.

Challenges presented by internal politics

With the convergence of DE and on-campus student demographics, and the increasing use of centrally supported learning management systems (LMS) such as WebCT for on-campus courses, DE units across the country were being disbanded or re-structured. We were convinced that a centralized DE unit could provide the best support for both urban and remote DE learners at our institution, but we lacked strong support from other faculties that, meanwhile, were facing resource shortages in the face of shrinking grants and increasing demand. The demographic shift to increasing numbers of on-campus DE learners had the unfortunate effect of placing DE in competition with faculties and departments for tuition revenue. Faculties and departments had begun to view DE as cannibalizing their on-campus enrolments, siphoning away income that they urgently required. We knew that being perceived as a threat to the viability of on-campus programs could only hurt our already marginalized existence.

We therefore needed to build closer ties with our internal partners (the faculties and departments with DE offerings), in order to gain support and provide our unit with greater visibility across the campus. To achieve this, we concluded that we had to find a way to financially reward their participation. While this would further constrain our immediate ability to fund e-learning initiatives, we felt that it would enhance our viability in the longer term.

In view of our changing learner demographics and the need to attend to internal stakeholders, we decided on a short-term e-learning plan. Given that we had little concrete evidence to guide our decisions, we determined that, until we had several years' data to direct our plan, we would continue to support the limited number of online courses we currently offered, and entice (rather than compel) students to go online by offering opportunities. These attractions included optional online discussion groups in IS courses, and services such as online posting of receipt and return dates of students' assignments (done manually in DE) as well as online grade posting, optional online assignment submission and return, and uploading of IS course materials and instructor letters of welcome as PDF files. With the exception of the PDF files, these services had the potential to serve the dual purpose of lowering our costs (e.g., postage, staff time to respond to student enquires) and make greater use of the LMS that had been adopted for campus-wide use.

Investigation

In order to inform our decisions regarding e-learning course and service delivery, we started to collect and analyze data relating to enrolment, finances, and technology use by students. The primary research questions were:

a) What disciplines, course levels, and delivery methods attracted the highest enrolments and offered the highest return on investment? and,

b) What factors were responsible for these differences, if any?

As one of our measures of return-on-investment, we began to investigate enrolment patterns to determine which faculties and delivery methods attracted the most students. We also began to track student success rates using these variables in order to identify patterns of attrition by delivery method, and plan appropriate revisions or additional student supports.

As part of our cost recovery budgeting, we began tracking direct expenses and income at the course level for course development and delivery. We tracked direct (variable and fixed) and indirect costs (largely allocated staff costs, but also costs for the unit as a whole, such as marketing and promotion, student services, reception, and research).

As a cost recovery unit, we could not afford to employ the assumption of "build it and they will come." While we were eager to move quickly ahead to enhance our courses with online content and learning activities, we needed evidence of what students *actually* do with respect to online learning, as opposed to what they *report* they do. It can be difficult and expensive to gather accurate data relating to students' online activity, but we determined that one measure of how willing and able our students were to go online would be to investigate the rates at which they accessed optional course discussion groups. Results of an earlier survey that included questions relating to the reasons why students enrolled in DE courses were also reviewed.

Findings

Return on investment

Analysis of six years of data suggests that, while enrolments have increased in online courses, enrolments in independent-study courses consistently exceed them by a considerable margin. From 1999 to 2004, enrolments in IS courses increased by 7,002 credit hours, while enrolments in OL courses increased by 1,223 credit hours. For every IS course credit hour that we added between 1999 and 2004, we generated 584 credit hours of enrolment. In contrast, for every OL course credit hour added during the same period, we generated only 27 credit hours of enrolment. Given that our income is variable (i.e., per course credit hour enrolled), and the majority of our direct delivery costs are also variable on the same credit hour basis, greater economies of scale were created in IS courses.

Examining return-on-investment by comparing the total number of credit hours enrolled (CHE) in relation to the credit hours offered (CHO) in IS and OL, we found that from 1999 to 2004 the ratio of CHE to CHO rose from 27 to 42 (56%) in IS courses, and from 11 to 21 (91%) in OL courses. Therefore, while OL offerings continue to generate far fewer CHE per CHO than IS offerings, enrolments in OL courses have begun to show promising increases.

With respect to the year-level of courses offered, the ratio of CHE to CHO is highest for entry-level survey courses. This was anticipated as these are also the most heavily enrolled on-campus, and over half of our students are drawn from that population.

Examination of the faculties in which the increases in IS and OL occurred provided

additional relevant data. The two faculties with the largest number of IS and OL offerings are Arts and Science. As illustrated in Table 1, in 2004, IS courses in Arts and Science continue to generate higher enrolments than OL in terms of overall enrolment per credit hour offered as well as in terms of enrolments per additional credit hour offered (215 in Arts; 69 in Science). In other words, not only were IS Arts and Science course offerings more heavily enrolled by 2004, but enrolments increased faster than did offerings. This latter point is particularly important in cost recovery DE programming because new courses carry not only delivery costs, but also amortized development costs, and therefore generate less return than do existing offerings.

Table 1. Growth in IS and OL, by faculty

Faculty	***Delivery method***	***Increase in CHE for each additional CHO***	***CHE/CHO ratio***			***Increase in income***
			1999	**2004**	**Change**	
Arts	IS	215	29	46	+ 63%	$668,000
Arts	OL	14	5	11	+ 120%	$ 28,300
Science	IS	69	43	49	+ 14%	$109,300
Science	OL	32	17	30	+ 76%	$116,100

The greatest improvement in the ratio of CHE to CHO was in OL courses, and while these percentage increases were high, the CHE/CHO ratio remained considerably lower in OL courses than in IS. As well, offering additional credit hours generated fewer enrolments than in IS. Nevertheless, the improvements in CHE/CHO in OL offerings, particularly in Science, are encouraging for future OL development.

When attrition rates were examined across the six-year span, there appeared to be no significant difference in the rates between IS and OL in Arts or Science courses. Attrition rates averaged 15-16% in Arts courses, and 14-18% in Science courses.

Development and delivery costs

As at other institutions (Rumble 2000), the costs of development for our OL courses are higher than those of IS, particularly with respect to instructional design, programming, and digital copyright clearances. Moreover, the infrastructure (hardware/software acquisition, upgrading and maintenance; and staff training) and direct costs of delivery are higher in OL courses. For example, our course maintenance, and instruction and tutoring costs are 12-30% higher in OL courses. While savings have been realized on some direct costs and overheads for OL course delivery (e.g., on printing, packaging and mailing; deletion of manual tracking of assignment and grades, and a centrally supported LMS license and help desk), these have been insufficient to offset other higher delivery costs.

Comparisons such as these, of course, provide only a snapshot of current costs, and will require further investigation. It must be recognized that units such as ours have had many years to refine our IS systems, but are still in the early (and more costly) stages of developing systems for OL delivery. Furthermore, the higher costs of OL courses reflect not only higher start-up costs but also much lower economies of scale than are present for IS courses.

Students

With respect to technology use by students, the rates at which students accessed optional online discussion groups in IS courses were analyzed in 2002 (Miller & Wallace, 2002) as a measure of how likely students would be to voluntarily go online for at least a portion of their learning activities. Initial results determined that less than 20% of IS students accessed the course site to read postings, and less than 10% accessed the site and posted an item, suggesting that most students in IS could not, or would not, participate in the online component. Not surprisingly, a major factor affecting access and posting rates was how frequently the instructor posted messages. As classroom instructors have

long observed, many students in undergraduate courses tend to be reluctant to participate in discussions, are more interested in what the instructor has to say than in the observations of other students, and focus their interactions with the instructor on housekeeping questions (grades, topics to be covered on tests, etc.). DE undergraduate learners also appear to be reluctant to engage in discussion, and are instrumental with respect to where they invest their study energies (hence the widespread need to assign grades for participation in online courses).

The less than enthusiastic online participation of students in optional discussions is consistent with the patterns of enrolment that we observed in courses that we simultaneously offered in both IS and OL format, in the same term, with the same instructor. While the sample was small, IS enrolments in such sections exceeded those in OL sections by a factor of five.

Our research on the reasons why urban students, who presumably had access to the campus to take face-to-face courses, chose DE courses suggested that the major motivation of these students to enrol in DE courses was to gain control of the time and place of their learning. These learners carried full course loads while working an average of 20 hours per week in service sector jobs in which they had little control over their shifts, and they enrolled in DE courses in order to allow them flexibility in where and when they studied. In other words, in Cross's (1981) terms, the barriers to education faced by our urban learners were largely of a situational nature (pressures of time resulting from work and study demands), rather than psychosocial or institutional. The barriers faced by our learners at a geographic distance from the campus were also situational but arose from geographic distance, and the need to balance the full-time responsibilities of career and family.

The popular assumption that OL courses offer more flexibility for learners may be challenged by our findings with respect to enrolment, technology use and learner demographics. These findings suggest the possibility that enrolments in OL courses continue to lag behind IS because these courses may in fact offer less flexibility than IS courses. While our students seem to be willing to go online for some services and learning activities (e.g., grades, instructor contact, library searches), they appear to resist enrolling in courses that require that all of their learning activities take place online. It may be that, until wireless technologies become more widespread in urban areas, and high speed internet service more available in remote areas, independent-study courses will continue to allow both populations of DE learners to overcome the situational barriers they encounter to university study. Young urban learners will then have the independence to study en route to campus or work, or during their breaks at their "McJobs," and adult learners at a geographic distance will have reliable and affordable online access.

Building internal support

Rewarding the participation of faculties and departments through DE tuition sharing has had the desired effect of increasing their participation and building internal support for the DE unit. While faculties and departments are not compelled to deliver their distance or online offerings via the DE unit, the financial benefits that the unit now offers have resulted in a number of new partnerships. New partners have clearly indicated that, had the income sharing agreement not been in place, they would not have agreed to develop or offer DE courses. At the institutional level, the growth in DE partnerships has reduced the need to replicate at the faculty level the capital and human resources required for distance and online learning.

Conclusion

The past decade has been the most challenging (and expensive) in our over 40-year history of offering DE courses. In response to the increase in on-campus students in DE courses, we have added facilities and services to attend to students who came into our offices to pick-up course material, drop off/pick up assignments, and consult with staff. While helpful to students, the development of these services duplicated the functions of our print/mail course distribution system and call centre. Then, as we developed OL courses, we further duplicated systems to support OL course delivery and services. This service duplication, as opposed to our choice of technology, has been the greatest factor in increasing our costs. We have not seen, nor are not likely to see, significant cost reductions until we can delete some of this service duplication by moving our course materials distribution online.

The development of OL systems concurrent with IS systems was necessary, however, in order to allow us to conduct small-scale studies such as this one, and to prepare our unit for the shift of learning activities, courses, and services online. This shift, while further in the future than we once would have anticipated, nevertheless

remains our goal, for both financial as well as pedagogical reasons.

As a result of our investigation, our strategic plan now currently outlines the following objectives:

- Continue to attract, rather than compel, learners online by enhancing online student services: program information, marketing, and student advising. Students will be directed to our website, but assistance will also be available in person and by phone. Online services will continue to be selected for their likelihood of meeting our goals of enticing students online and, wherever possible, reducing overheads.
- For the next three years, continue to develop online courses as well as add online components to IS courses, particularly in the Sciences. We will then be prepared to move online at the rate that our students do.
- Lower online course development costs by using third-party materials (e.g., learning objects, publishers, and leasing courses from other institutions).
- Continue to build internal support and reduce marginalization of the DE unit by providing incentives for participation by sharing a minimum 20% of DE tuition income with participating faculties and departments.

We have learned several important lessons from this investigation. The first relates to the fundamental marketing principle of knowing your consumers. It is critical to determine what characteristics learners share and ways in which they are different. Cost recovery units cannot afford *not* to conduct market research, and should not put more energy into understanding the technology than they invest into understanding their learners.

Secondly, projects in which expenses and income are direct and variable (vs. indirect and fixed) allow closer monitoring of cost recovery and economies of scale. Such budget tracking may reveal that anticipated savings in direct costs may be offset by increases in indirect costs (mailing vs. programming staff time).

Finally, when adopting learning technologies, we should work to remove barriers to access, rather than add to them. We should not, for example, assume that students necessarily want to conduct all of their learning online, nor that online learning activities are inherently more engaging or pedagogically superior than those employing other technologies. Compelling students to go online before they are ready, willing, or able may result in poorly subscribed courses. Instead, we should first use the online environment to provide affordable services and learning activities most needed by students.

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Chapter 22

Only One Million Teachers to Train ...

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Abstract: Strengthening Capacity in Basic Education in Western China (SCBEWC) is a five-year, $12 million project currently conducted by China and Canada in partnership. The project goal is poverty reduction through enhanced teacher training systems using distance education in Western China. To achieve this goal, the project focuses on teacher education – ultimately for over one million teachers. Working with China in collaborative teams, Canada provides expertise in student-centred instruction (SCI) and distance delivery while building Chinese capacity to design, implement, and sustain this teacher education program. Now at the midpoint of the project, this paper examines some of the project management tensions and challenges encountered in a multinational program of this size and complexity, and goes on to discuss solutions, models, processes and tools used (and proposed) up to this point to resolve issues.

Key words: Canadian International Development Agency (CIDA), Teacher education, Multilateral projects, Distance education, Scalability, Capacity building, Content and context

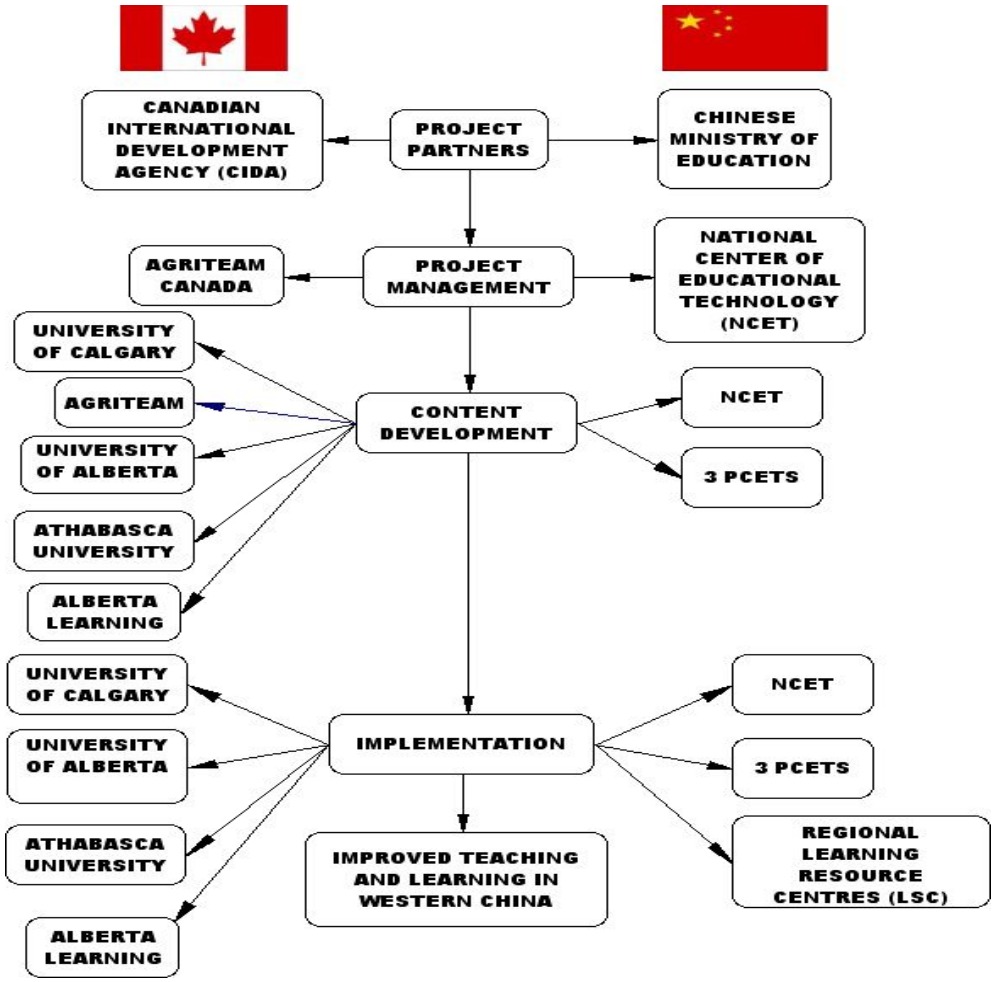
Strengthening Capacity in Basic Education in Western China (SCBEWC) is a five-year, $12 million project, jointly developed by the Chinese Ministry of Education and the Canadian International Development Agency (CIDA). Its goal is poverty reduction in Western China through enhanced teacher training systems using distance education for Basic Education teachers. Basic Education includes grades 1 to 9. While it must be noted that China has made progress in poverty reduction, currently 17% of the world's poor live in China. Peter Morgan, the SCBEWC project manager in China, lists four significant challenges for basic education in Western China that project management must deal with, including:

a) The need for large, scalable solutions – solutions that have not been attempted before. For example there are 10 million teachers in China, over 1 million schools and 100's of millions of students;
b) The need to increase the effectiveness of schools by making the school environment more appealing to learners and their parents and making the benefits of higher education accessible to the graduates;
c) The relatively low level of existing educational achievement of teachers, the need for further academic upgrading, and the lack of access to required academic and professional development training; and
d) Financial arrangements that make it difficult to offer basic education free of all fees for students and that make professional development unaffordable for teachers, schools and cash-strapped county Bureaus of Education.

Six counties in three provinces in Western China were selected for the SCBEWC project based on need, culture and language. Languages and cultures reflected in these countries include Tibetan, Kazak, Uygher, and Mongol, and Hui, in addition to Mandarin. By the end of the project all materials will be developed and delivered in these languages.

The two major partners (CIDA and the Chinese Ministry of Education) in this multinational endeavor assigned specific tasks to individual agencies and organizations in their respective countries (see Figure 1).

Figure 1 – SCBEWC Project Participants



In the case of CIDA, direct responsibility for project management was awarded to Agriteam Canada, a Canadian consulting company specializing in international development (www.agriteam.ca). The Chinese Ministry of Education (MoE) involved its National Center for Educational Technology (NCET). Agriteam and its partners (three Canadian universities and one provincial ministry of education) are working with their Chinese counterparts (the Chinese MoE, NCET and three provincial centers for education technology - PCET), to share Canadian expertise in teacher education and distance education. The goal of this collaboration is to develop a systematic approach to improving basic education and to build Chinese capacity in a manner that is respectful of the various cultures and minority groups in Western China. Further, the partners agree that it is important that this approach be sustainable beyond the five years of the project and Canadian involvement.

At the time of this writing, the SCBEWC project is at the midpoint. Therefore, it is timely to consider the key management tensions that have arisen between the project goals and the actual practices to date. This consideration can offer readers a sense of best practices and lessons learned in a complex and multilayered context.

Three principal tensions appear to be impacting the project. The first is obvious. The project requires that Canadian and Chinese education professionals work together in a collaborative manner that transcends issues of language, culture, and geography. Language, alone, is an issue, but so is the understanding of the notion of collaboration. When one party (the Canadian team) is seen to be bringing expertise, the second party (the project's Chinese

counterparts) may be reluctant to share their perspectives and opinions as the playing field is perceived to be unequal. However, one might speculate that it is only with a rich infusion of cultural context from the Chinese side that the deliverables in this project will be relevant and maintain the sustainability of the project. Solutions to this tension have included (1) the establishment of a Beijing office staffed by Canadian and Chinese administrative and subject matter experts, and (2) the matching of a Canadian and Chinese member for each job on content design, implementation, or phases of the research project. By partnering in this manner, skills and experiences are shared and each person builds capacity to work in this multinational, multicultural context.

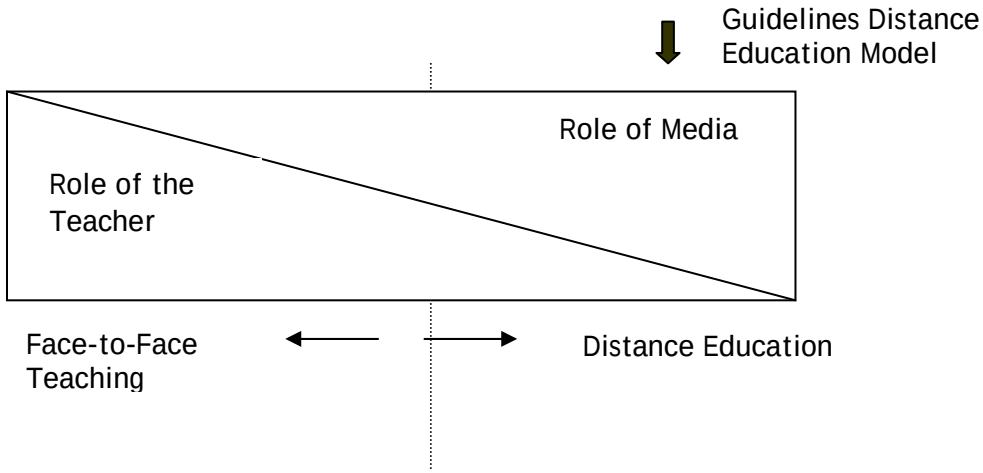
Second, the Chinese structure tends to be more hierarchical. There is a national education system, and that system is tied to both political and governance issues across the country. The Canadian project structure is more flat, which ironically has created some of the greatest challenges in the project in terms of project implementation and clarification of roles and responsibilities. Until recently, the four Canadian partners have tended to worked independently on their specific project components, inadvertently creating silos of expertise within the project. It is interesting to note that the creation of the Distance Education Guidelines (created after the completion of the first distance education course – SCI Course One) has caused members the Canadian partners to come together and talk about course development assumptions and some core elements of the project design.

The third tension concerns the difference in the views of distance education held by the various partners in the project. Initially, some Canadian partners were concerned that student centred instruction (SCI) could not be presented effectively through online delivery (see Appendix A and B for descriptions of Student Centred Instruction and the Chinese National Curriculum). They were concerned that because SCI required exploration, discussion, and collaboration, the online version of the training might be of poor quality and core principles might be lost. Further, these same people were concerned that the technology available to teachers in rural schools, in some of the most remote parts of Western China, was inadequate to allow teachers regular access to the online course and online interaction with facilitators, mentors, and colleagues in the course.

Part of the solution to this third tension rests in the La Ka Shing Foundation, which generously provided hardware to the project schools. However, the Foundation could supply receive-only satellite (Internet Protocol or IP) systems. This system allows NCET to transmit content to learning support centers in the project's three county schools; however, this system does not allow for interaction as the receiving sites cannot send content back to NCET, or even email. Therefore, teachers at the project schools can download the content, print it or burn it to CD-ROMS; and there is often no other Internet capacity in those schools.

The use of the IP satellite has caused the Canadian distance education team to rethink an instructional design model that honors the constraints and strengths of the available technology and the core principles of SCI while building intentional opportunities for interaction to occur at the Learning Support Center (LSC) sites. The following diagram, presented by the Canadian distance education specialist, reflects the importance of content and the shifting roles of teacher and technology within the SCBEWC project.

Figure 2 – Role of Media and the Teacher in the Distance Education Context



The three tensions presented above will be elaborated later within the context of the four project management challenges presented earlier (see Lessons Learned).

Project Objectives

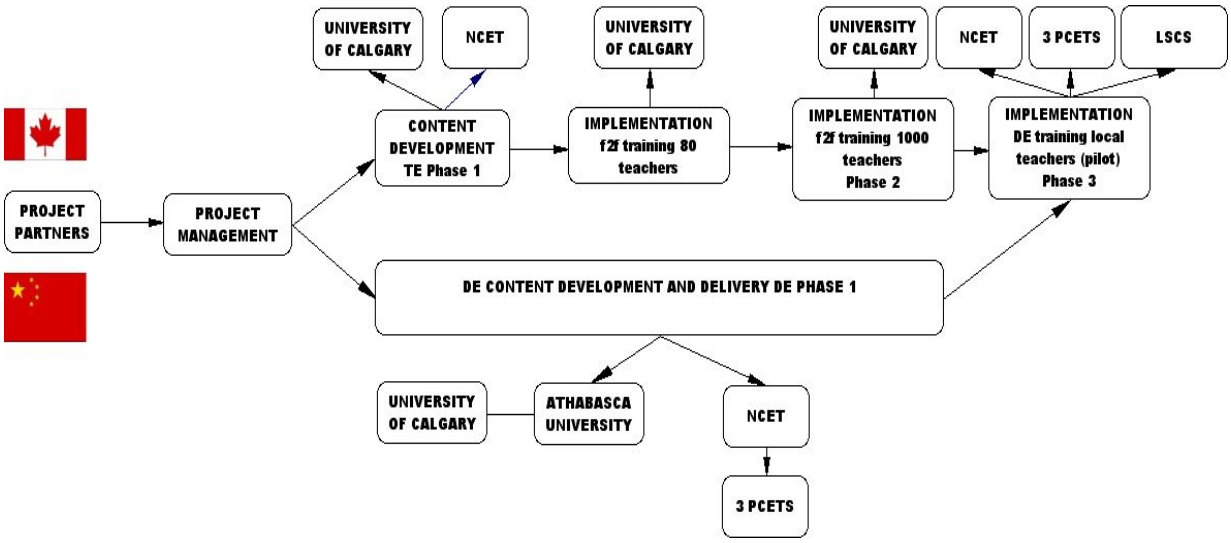
While the ultimate objective of this project is poverty reduction through a systems approach to improve learning for children, its focus is on teacher training. In order for the project to reach the intended capacity (initially 1,000 teachers) and be sustainable (ultimately 1 million teachers), it must be developed in such a way that it can be delivered over one way satellite (IP system) and be pedagogically sound for adult learners. Further, the development must be nimble enough to be adaptable to technological advances. Content also has to map onto the New Reform Curriculum for China, which is moving toward a student centred, experiential approach – a concept quite new for Chinese educators.

While distance education is not new in China, the use of the Internet through the IP satellite as a delivery mechanism is. Television has been the main mode for upgrading teachers' qualifications. A goal of the SCBEWC project is to allow teachers to experience student centred instruction as learners, first, before they are called upon to teach with that approach. Therefore, the project must leverage the existing IP delivery system in such a way that it can model student centred instruction within the course content. Another goal of the project is to build the capacity of Chinese educators at the National Centre for Educational Technology (NCET) so they can continue to develop and deliver quality, pedagogically sound, and increasingly interactive distance education materials once the five years of this project are over.

The SCBEWC project has chosen a cascade model to train Chinese teachers. This model initially set out to train 80 teachers from each of the project LSCs, expanding to 1,000 the following year, and 10,000 within two years. Ultimately one million Chinese teachers will have access to the training materials.

The objective of Phase 1 of the project was to train the first 80 LSC teachers. These teachers were given face-to-face classroom training by Canadian teacher education specialists in student centred instruction (Student Centred Instrcuction: Classroom Suggestions for Teachers) and strategies for delivering subsequent training to their colleagues. Phase 2, again face-to-face, provided Canadian support for the initial 80 teachers as they conducted workshops in their counties for approximately 1,000 teachers. Phase 3, currently being conducted at the time of this writing, is the testing of the distance education (DE) version of Course One - Student Centred Instruction with a second 1000 teachers who will receive the material via the IP satellite (for more see http://www.ncet.edu.cn/cidacourse1). The DE version of the course is supported by project teachers who are backed by headmasters and resource teachers who participated in Phase 1 and 2. Running concurrently with the 3 phases (Figure 3) is the content development phase of training NCET personnel in authoring content for distance delivery.

Figure 3 – SCBEWC Project Phases and Timelines



Lessons Learned

The challenges and tensions presented above have created a unique situation for the management of the SCBEWC project. While some of the challenges are ongoing, others have been addressed.

Challenge One, the need for a large, scalable system to meet the need for teacher education, is at the heart of this project. As stated earlier there are 10 million teachers in China, over 1 million schools and 100's of millions of students. Currently, there is not a model in place to inform the design of a project with this scope. The SCBEWC project implemented the cascade model described above, using distance education to make it scalable. From a project management point of view, implementation of the cascade model required a huge front-loading of Canadian design and development expertise in the early stages in order to build capacity for the Chinese partners. Subsequent stages see the Canadian participation shifting to a supportive role.

Building the capacity of Chinese partners to develop distance education with a student-centred focus is an important part of this Canadian support role. In Summer 2004 two Canadian experts worked with four Chinese NCET professionals and two LSC teachers to convert Course One – SCI from its original face-to-face format to distance delivery. After one month, the Canadian experts returned home, and NCET and PCET completed media pieces, produced, and delivered the course via IP satellite to the teachers in Phase 2 of the project. Ongoing assistance was provided by the SCBEWC Beijing office. The ability to do this reflected the skill of the NCET team, and the benefit of the training and instruction provided to the team by the Canadian experts.

In the transition from Phase 1 to Phase 2, the Canadian side wrestled with issues of how to merge the face-to-face content prepared by one university with the distance education requirements suggested by a second university. With negotiation, an instructional design process acceptable to all partners evolved, and Phase 2 participants moved successfully through it. The need to capture this process was recognized by the end of the work shown in Figure 3.

From a project management point of view, the creation of the guidelines document to reflect the process was critical. Therefore, in addition to the DE version of Course One, a tangible product of the design and delivery of SCI from Phase 2 of the project has been the creation of a DE Guideline document which will direct subsequent course design, development, and implementation. Later phases (completed by Canadian and Chinese subject matter experts and instructional designers) will build from the guidelines, thereby creating a common look and feel to the remaining resources developed in the

project. The project manager can also use the DE Guideline to monitor the process, to ensure consistency of the products, schedule time and to manage resources.

Project partners will need to recognize that the guidelines document is a living document, suggesting that templates, instructional design steps, and standards are NOT cast in stone and need to be open to some degree of negotiation. However, variances from the guidelines will require approval from the project management and will need to be based on clear rationale (e.g., specific issues in the Chinese context, technology concerns, National Curriculum, and teacher competencies).

Challenge Two, the need to increase the effectiveness of schools by making the school environment more appealing to learners and their parents, and making the benefits of higher education accessible to the graduates, is central to the design of Course One – Student Centred Instruction (SCI). SCI as an instructional strategy maps closely to the reforms called for in the new National Curriculum initiative in China. Working with Chinese colleagues from NCET, a team from University of Calgary wrote training materials entitled *Student Centred Instruction: Classroom Suggestions for Teachers*. For the initial training (illustrated in Figure 3 – Phase 1), copies of these training materials were made in Chinese for the 80 participants. As the project considered the training of the next 1000, the decision was made to publish the materials in China in all languages.

This decision prompted the issue of language considerations. Many of the teachers were from counties in which Mandarin was not the first language; materials needed to be translated into Kazak, Uygher, and ultimately Tibetan. From the project management point of view, this created a major wrinkle in terms of costs, production time, and distribution before the training could begin. While the initial developers of the content wrestled with issues of cultural sensibilities, minority education, diversity, and language, the actual production was a challenge. Subtle issues of which languages were privileged over others in terms of first-off-the-press or delayed-in-production were a concern among workshop participants.

Also, the selection of specific readings within Course One was drawn into question. How would the work of Dewey or Vygotsky be received by rural educators with limited amounts of formal, academic education? Concern was raised that, as the project moved through each group of participants in the cascade model, the skills and abilities (due to varying degrees of access to formal education) of the teachers would be less appropriate for handling the material. Specifically, it was feared that the first 80 teachers might be more formally trained than the 1000 that followed. In Summer 2005, a formal evaluation will be conducted to determine the impact that the previous face-to-face training and DE materials has had on those who have engaged with them. This evaluation looked for evidence of changed teaching practices. Based on field observations to date, the rural teachers have risen to the challenge of the content presented to them, and to varying degrees there is evidence of changed and improved practice in their classrooms. The mixed method evaluation completed in May 2005 determined that the project has in fact begun to change teaching practices and professional development activities. The project manager is currently using those results to inform subsequent actions and project directions.

To some degree, Challenge Three has been touched on in the preceding paragraphs. Without a doubt, there is a relatively low level of existing educational achievement among teachers in the rural schools. Through the development of quality content, tied directly to the Chinese curriculum and context, distance delivery will help with the increased capacity of rural teachers who previously have received varying amounts of professional training in teaching. While many of these teachers use existing lessons designed by NCET and delivered by the IP satellite, this sometimes translates into students watching a television show of a master teacher presenting content that is often quite removed from the students' rural contexts. Therefore, the content presented in the SCI training materials developed for this project attempts to introduce SCI as an instructional theory to help teachers create content that is more engaging and relevant to the students, thereby reducing the high drop out rate for rural and minority school and helping with poverty alleviation in Western China. Thus, it is critical that the teachers at the bottom end of the cascade model also learn to create and modify content relevant to their own contexts. Therein rests the challenge.

Teachers with the least education and the fewest skills will be most reliant on the media in the distance delivery format and have the least

access to teacher-mediated instruction (see Figure 2). During the remaining two years of the project, additional content will be produced and delivered. Critical to the design of this content is the connection to Course One so the samples and examples do not become cookie cutter templates of generic lessons, only to replace the existing NCET materials. Due to the hierarchical administrative structure (see Figure 1) described previously, it is anticipated that a transfer of project management will move from Canadian suggestions to Chinese directives to make this happen.

An understanding of the technology promises and limitations of the distance education delivery options will be critical. The DE Guideline Document will go a long way to assist with developing this understanding. However, technology is not stagnant, so the project managers for both Canada and China will need to be informed as to developments on the technology front. Because China has not created a huge and costly landline structure, it has been able to embrace cell phone technology. It is reported that almost all of China has cell service, and it is a pervasive technology available to almost everyone, as it is relatively inexpensive. Therefore, exploration of the capacity of wireless handheld units may offer an alternative to the exclusive use of the IP delivery system.

While the IP satellite may continue for large transfers of content, wireless options may provide a solution to the issue of interaction. Of concern is the push to consider learning management systems - LMSs. Recent articles suggest that LMS contracts are currently being signed in China, and this move is being seen by Chinese decision makers as adopting the current standard for DE in the West. From a project point of view, this will have large implications for the Implementation Guidelines and the design of existing and subsequent content development. Further, because the computer ratio in many of the rural schools is 1 per school, adoption of a LMS, requiring continuous computer access by users, may exacerbate the digital divide event outside the urban centers.

Therefore, one of the solutions to the technology conundrum is the use of scenario-based case studies of the project sites. The SCBEWC project manager has approved the development of descriptive scenarios so both the management team and the sites themselves can understand specific training, hardware, and content design needs. Through the use of scenario-based models, the SCBEWC project can modify professional development and suggest technology purchases and curriculum design to meet what appears to be four prevalent situations across the 360 project schools. As the Chinese educators use the system to scale the project to ultimately address the learning needs of the one million teachers, the scenarios will again be helpful to make sure the content, delivery, and support are relevant to a specific teacher's needs.

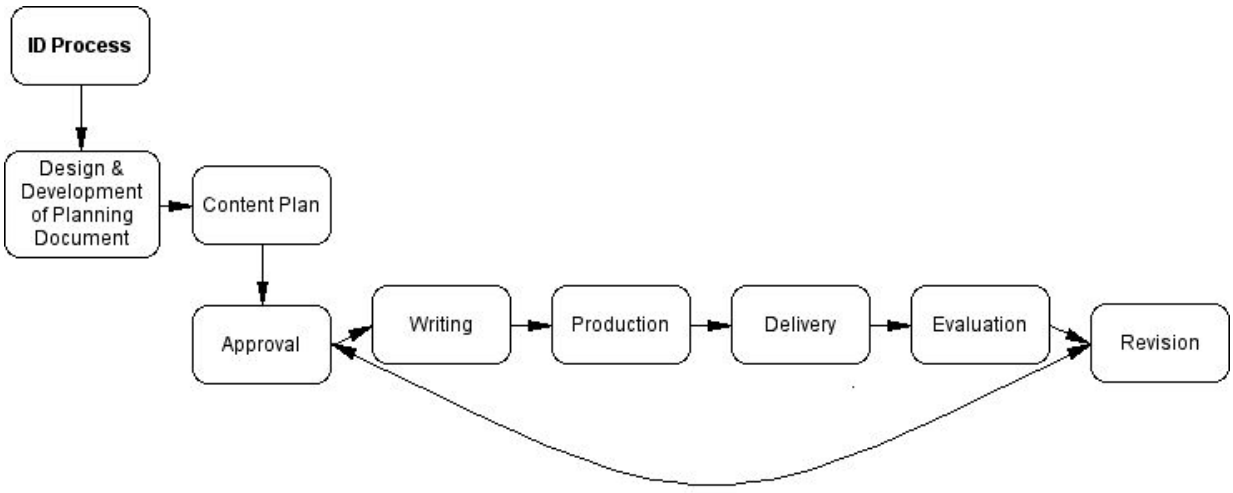
The notion of scenario-based case descriptions came out of the alpha testing of DE Course One. A Canadian and Chinese DE expert went into one province and met with PCET personal there. It became apparent that some schools had better hardware and more skilled staff than others. With the help of the local PCET staff, the DE experts were able to describe four scenarios consistent among schools in that province. The DE experts were then able to ask the PCET staff to take them to schools reflecting the various scenarios, talk with teachers and administration in those site to further understand DE needs and concerns, and to gain an idea of the technology infrastructure that is available in the project schools. Based on the scenarios, the project will need to provide a multifaceted approach to DE delivery. Further, it will need to think creativity about existing as well as future content development strategies to ensure that the most rural members of the project, usually those in the most need, will be included and supported rather than becoming the typical causalities of the digital divide.

The Fourth Challenge is finding a way to ensure basic education is free of all fees for students and professional development is affordable for teachers, schools and cash-strapped county bureaus of education in project sites. While this is a concern across most of China, especially those areas away from the eastern urban centers (e.g. Beijing, Shanghai), the SCBEWC project is only responsible for its six counties. However, the project management strongly believes that the sustainability of this project rests with the development of a model that can be replicated in other situations and countries.

Through the development of the DE Implementation Guidelines, the project management has been able to define a process for the production of site specific, quality distance education content. Based on a fairly typical instruction design process, shown in Figure 4, Canadian distance education experts

and subject matter experts have been partnered with Chinese counterparts. The design process allows for the partners to come together and develop both individual skills and usable content in a systematic way. Since joining the SCBEWC project in Summer 2004, the current Canadian project manager has been clear that a major goal is the development of a working system for content development and delivery rather the design of specific content pieces. It is this belief in the value of a systematic process over curriculum development that may have the biggest impact in addressing the goal of affordable learning for teachers and students.

Figure 4 – Instructional Design Model for SCBEWC Project

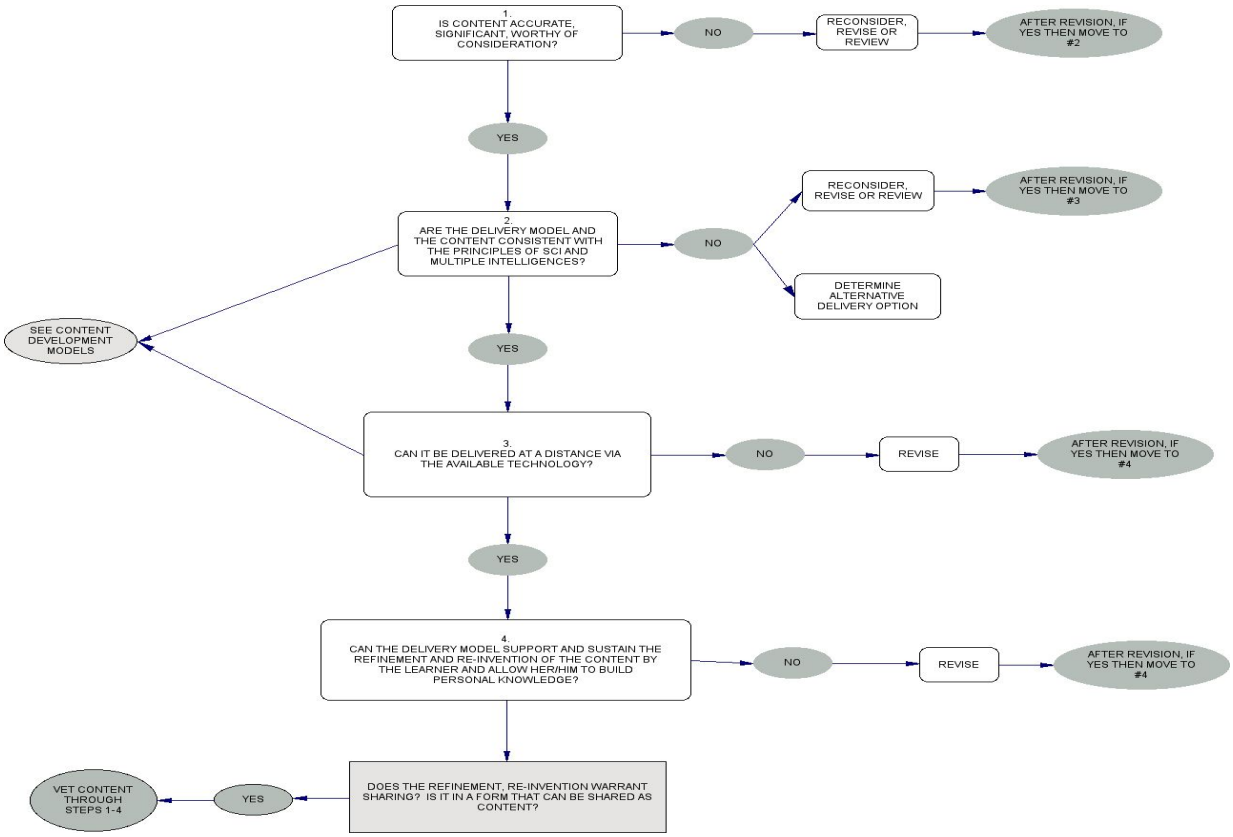


The focus on the delivery of learning opportunities for rural, remote teachers and administrators in the project sites via distance education is what will make the SCBEWC scalable. Re-thinking instructional design for distance delivery within the constraints of the scenarios in the SCBEWC is the ongoing challenge. As the technology changes and rural areas gain increased access to the Internet, the ability of the project to incorporate online social interaction to support learning will improve. Eventually, the sustainability of the project will rest with the teachers who have continued the training. When they are able to share site-specific activities (e.g. lesson plans, examples of student work) with their colleagues across the counties, the project participants will know that the training was effective and appropriate.

Yet another potential tool to simplify project management is shown in Figure 5. This model could be used to consider if the content that is developed should be delivered via the IP satellite. Steps 1 - 4 query the appropriateness of content developed by SCBEWC's content developers (Figure 1). Steps 4 and 5 involve the teachers in project schools. Step 4 asks whether the content being presented is nimble enough in its design to support a teacher working with it to build personal knowledge. In other words, has that content been presented using the principles of student centred instruction so that the teacher can engage with it, reflect on it, actively do something with it, and build meaning relevant to themselves within their context. Step 5 asks if the personal meaning is something that should be shared with others enrolled in the course or participating in the project. From a project management point of view, SCBEWC staff will have to develop an online management system that will allow for vetting of the content through the consistent application of a project standard. Further, that management system will need to be able to index and distribute the new content is a timely and organized manner.

Further, it suggests that teachers will continue to access Course One as ongoing professional development. This is quite a departure from typical distance education course where students complete a course and move on.

Figure 5 – Vetting Diagram for SCBEWC Content



Conclusion

The goal of the SCBEWC project is poverty reduction in Western China through enhanced teacher training systems using distance education. The target group is teachers working in grades 1 to 9. Because there are millions of teachers in China, the approach taken is to improve educational practices through distance delivery of professional development courses that support the new National Curriculum for China.

Because of the four challenges identified for the management of this project, the SCBEWC partners are facing some unique implementation issues. As this chapter is being written, the project is at its mid point. The approaches for project management that are being developed for this project are moving the partners in interesting, innovative directions. As with any project, new approaches have the potential to cause a certain degree of discomfort for the participants that results in particular types of tensions. However, the sustainability of the project rests with the partners working through those tensions to create positive solutions that allow the project to accomplish its larger aims without resorting to quick fixes.

It is the focus on the development of a sustainable systematic approach to the development of quality content, delivered at a distance; it appears that the SCBEWC project is an interesting case for ongoing study.

As Bill Gates stated at the recent Davos World Economic Forum, "China is going to be the change agent for the next twenty years." The SCBEWC project may, in small part, influence some of this change.

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Appendix A – Student Centred Instruction (from the Distance Education Guidelines – SCBEWC Project)

Student centred instruction means:

- The student, not the teacher, is the focus of attention.
- The student is *active*, involved in activities that foster learning (not passive, just sitting listening or taking notes).
- A variety of ways of learning are offered, since people learn in different ways.
- Teachers provide a variety of activities for learning in order to catch student interest.
- Students of both genders and all ethnicities are assisted to learn in ways appropriate to them.
- Teaching is adapted to the developmental level of the students.
- The teacher observes students carefully to learn what they are able to do and what they are trying to learn.
- The teacher prepares lessons to take into account the development and the individual differences of students.
- The teacher uses observation and assessment of students in order to plan further instruction.
- Students are encouraged to become responsible, independent persons who continue learning throughout their lives. (*Student Centred Instruction in Basic Education: Classroom Suggestions for Teachers, 2003,* p. iii)

The International Society for Technology in Education - ISTE (2002) states:

> "Traditional educational practices [as practiced around the world] no longer provide ... teachers with all the necessary skills for teaching students who must be able to survive economically in the global workplace. Teachers must prepare students to apply strategies for solving problems and to use appropriate tools for learning, collaborating, and communicating. As technology becomes a supportive resource for teaching and learning in the classroom, teachers move from traditional teaching strategies to strategies proven by research to promote more effective learning. "

Traditional Learning Environments	New Learning Environments
Teacher-centred instruction	Student-centred learning
Single-sense stimulation	Multisensory stimulation
Single-path progression	Multipath progression
Single media	Multimedia
Isolated work	Collaborative work
Information delivery	Information exchange
Passive learning	Active/exploratory/ inquiry-based learning
Factual, knowledge-based learning	Critical thinking and informed decision making
Reactive response	Proactive/planned action
Isolated, artificial context	Authentic, real-world context

Figure 1 Establishing New Learning Environments Supported with Technology

Figure 1 suggests that teachers plan learning activities that devote less time to the traditional learning activities found in the left column and more time to the corresponding strategies in the right column. The strategies suggested as indicative of New Learning Environments are described in research studies as more effective for improving student learning. Although the strategies in the right column do not specify use of technology, we know that technology used effectively best enables educators to achieve environments that support the powerful learning strategies listed (ISTE, 2002).

To help teachers understand how SCI can be implemented in the classroom, *Student Centred Instruction in Basic Education: Classroom Suggestions for Teachers* presents eleven topics for study. The topics and their relationship teaching practice are illustrated in the following diagram.

Appendix B – National Curriculum General Goals (translated from Chinese Ministry of Education Documents – available from Distance Education Guidelines)

The new curriculum should provide students with the knowledge and skills needed for the present and future. The new curriculum should incorporate values of patriotism, collectivism, socialism, and excellent traditions of Chinese history and culture; should develop the students' appropriate values and philosophy toward the world and life; should strengthen the students' accountabilities and abilities of serving their communities; should enable the students to be creative, practical, scientific, literate and environmentally sensitive; should develop knowledge and skills that are necessary for life-long learning; should enable the students to have a healthy life-style, physically and psychologically; should educate a new generation of students who are ambitious, moral , literate, and disciplined.

Specific Objectives

1. Shift from the knowledge-focused curriculum to one that emphasizes the importance of fostering students' active learning attitude. Knowledge and skill acquiring processes should become a process of mastering learning skills and forming appropriate values.
2. Shift from the overabundant subject-based curriculum to a systematic 9-year consistent curriculum where appropriate time is to be allocated accordingly. An integrated curriculum will also be developed in order to meet the needs of a variety of regions and students. The new curriculum should also be balanced, integrated, and appropriate for local situations.
3. Shift from the old curriculum content which was very difficult, complicated and out-of-date to the new curriculum which strengthens the relationship between the curriculum content and students' real lives as well as between modern society and technological advances. The new curriculum should also focus on the students' interest and development and reflects the most necessary knowledge and skills required by life-long learning.
4. Shift from the old curriculum implementation which emphasizes passive learning, knowledge memorizing and drill and practice to a new curriculum implementation that develops students' active, inquiry, hands-on learning as well as fostering the students' abilities in: collecting and analyzing information; acquiring new knowledge and problem-solving; and exchanging and communicating ideas with others.
5. Shift from the curriculum evaluation which focused on its selective function to a new curriculum evaluation that improves teaching practice as well as advances students and teachers' development.
6. Shift from the centralized curriculum administration to a decentralized on in which curriculum is administered at national, local, school levels. The new curriculum should be more adaptable for local areas, schools and students.

Chapter 23

Changing Your Learning Management System: from hype to happiness

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Abstract: What happens when you install a learning management system only to find that it doesn't meet your needs, and that the vendor is too slow to adapt to the changes that you need? If you follow the process in this chapter, you go out and search for a new learning management system, and try to apply the lessons learned from the problems with the first implementation. The process of finding and then implementing an adaptable learning management system that meets the business needs of the firm is described in this chapter.

Key words: Learning management systems, change management, vendor relations, hype curve, adaptability of software, merger

Learning management systems arrived on the educational scene in the late 1990s. From a few simple programs that tracked grades and courses, learning management systems have developed into highly sophisticated multi-featured programs that track and report on a wide variety of learning experiences. This rapid growth has not been without problems. For many people, e-learning, to date, has been a major disappointment or even a failure.

Part of the problem has been the incredible amount of hype that has accompanied the development and marketing of e-learning, especially during the hyper-competitive technology bubble that occurred in the market-place in 2000-2001. The Gartner Group (2004) has suggested that all technology goes through a predictable "hype cycle", with the following stages:

- Technology trigger
- Peak of inflated expectations
- Trough of disillusionment
- Slope of enlightenment
- Plateau of productivity

As an early adopter of both online courses and a learning management system, Konica Minolta Business Solutions (KMBS) in New Jersey, USA, has managed to graduate through all five stages of the hype cycle. This case study outlines how the first decisions on adoption of e-learning were made, the problems that arose, and the management of the change from one learning management system to another. Both client and vendor perspectives are given on the change management and project management processes involved.

Early Adoption of e-Learning

By 1998, Minolta USA, a leading manufacturer and distributor of high-end copiers in North America, had adopted various "home grown" computer systems, and like many companies had a variety of servers and databases scattered around the company. There was no coherent IT structure that allowed information to easily flow from one unit to another. It was next to impossible, for example, to pull together a companywide picture of the use of technology in training at that time.

The early adoption of e-learning started with a crisis. One of Minolta's copiers had a significant problem that needed to be modified quickly in the field. This necessitated service technicians at approximately 400 dealerships being trained as quickly as possible to fix the problem. Normally, this would mean sending trainers all over the United States to give courses to the technicians. Because there is no time for this, Minolta management decided that the only feasible solution was the development and distribution of an online course on how to service this particular copier.

During the same period, Minolta was installing an enterprise resource planning (ERP) system from SAP. This opened up new possibilities for using computer technology to communicate within and outside the company. A large-scale extranet, using secure Internet connections, was developed and used to communicate among suppliers, dealers, and Minolta headquarters. This experience resulted in a vision of using networked computer technology to improve the functioning of the business.

At that time Minolta was working with a technology vendor who also happened to have a learning management system (LMS), making it relatively easy to adopt this particular LMS. There was no analysis of needs, and no vision of the future possibilities of e-learning. Rather, the primary driver for this decision was the thinking that an LMS would cut down on instructor travel, thus saving money. Given that training at Minolta was primarily instructor led, e-learning was seen as an easier way of delivering training materials and instructor presentations to target learners. There was no thought of registering users or reporting results, or any other features that today are taken for granted as being part of a competent learning management system.

Minolta's experience was similar to all early technology adopters - both the vendor and the buyer experienced a considerable learning curve. There was little research available on the impact of e-learning, or how it should be deployed. There was little projection of future costs, which meant that it was impossible to budget for any increases in e-learning use. Moreover, there is no particular analysis of whether e-learning would meet the needs of the business.

As Minolta staff began to use the learning management system, it became clear that changes would have to be made in order for it to function in a way that was acceptable for training purposes. Because there was no central authority over the learning management system, requests for changes were coming from several parts of the organization. There was no one in charge of e-learning at Minolta at that time, and online initiatives had been started in Sales, Marketing and Service groups within the company.

After spending 1 1/2 years involved with the implementation of the SAP project, Marilyn Mitchell became head of the new e-business unit in 2001, and with this new position took responsibility for e-learning across the company. At that point, there were no specific requirements for e-learning, except there was a need to have all training records in one location.

Analysis of Issues with the first LMS

By the time Marilyn Mitchell took over the e-business unit, problems and issues with the first learning management system were becoming apparent. The LMS was “hardwired” and required vendor involvement to make the smallest of changes. Each time the vendor made a change, a hefty bill arrived for their work. At the same time the staff felt “locked in” because this learning management system was built with proprietary technology that would not link or integrate with any other learning technologies at that time. Online courses built had to be launched within the program, and could not be shared with anyone who did not have this particular software.

The software had not been developed from a user's perspective or an educational perspective, but reflected the thinking of a technology company. As the Minolta staff began to ask for changes, a big effort requiring lots of money was required from both the vendor and the Minolta staff. Huge amounts of resources were tied up with trying to improve a program that didn't work very well for the business. Minolta staff felt “boxed in”, and resolved to change the situation. The LMS was turning into a “money pit”, yet, because it was being heavily used, no one wanted to see it changed without a much better solution being in place.

The process of change started with Minolta staff drawing up a list of requirements for the vendor, who was then asked to give an estimate of the costs of making all the changes. The vendor's price turned out to be higher than many newer full-featured learning management systems available on the market. It was at this point that Marilyn Mitchell and her staff decided to start

looking for alternatives to their learning management system.

Staff began to investigate the many alternatives in learning management systems that were available at that time. They also talked to e-learning consultants and business partners about their experiences with learning technologies. An intense period of reading, going to e-learning trade shows, and searching the Internet for information and demonstrations of e-learning systems followed.

By this time the Minolta staff had learned about the phenomenon of "vaporware". Vendors often promised features that didn't exist but were heavily advertised. Staff learned to distinguish between what was coming and what actually existed and would work if installed at that time. This caution was driven by the need to make sure that a new system would work before the plug was pulled on the old system.

At the same time, the unhappiness with the first learning management system continued to mount. Staff exhibited increasing frustration levels when told by the vendor that a particular change could not be made available "until the next release" of the product. By this time, problems with the system meant that it was now slower to use than the previous home grown system that Minolta had built itself.

The biggest frustration was that the system crashed when running reports, because the database had poorly designed architecture. As well, reports were impossible to obtain for the most up-to-date list of regions and business units, because these continue to change. As in any business, Minolta experienced organizational change on a regular basis. Because it took over 90 days to make any changes in the learning management system, most new reports were out of date before they were implemented.

The Change Management Process

By this time, Minolta staff knew a lot more about what to expect in an LMS, as well as the required features of any LMS to be used in the future. Because the vendor of the first LMS was not able to response to Minolta's needs, a firm decision was made to search for an alternative LMS.

The change process included defining detailed business requirements, and a realistic projection of costs for the new software for present needs and into the future. A business consultant who had an in depth knowledge of Minolta's business and its culture was able to develop a comprehensive requirements questionnaire of over 200 questions. The answers to this questionnaire informed the writing of a very detailed specifications document.

All business units within the company, including sales and marketing, service and administration, were consulted on their ideas for the future LMS. Because people were attached to what they had built in the first LMS, there was some resistance to change. Those leading the change had to proceed carefully, convincing sceptics that the new system would be better for them in doing their jobs, and would address their priorities. This involved turning those who had a high stake in the success of any new system into "ambassadors" for the change, convincing others that this was a good thing that was happening.

As well, honesty with the vendor of the first LMS was important, as well as assurance from Minolta staff that the vendor would continue to do business with the company in other ways in the future. A disgruntled vendor could make a smooth transition to any new system difficult.

Process of choosing a new LMS

Because learning management systems can be major investments in time and money, the process for choosing a new LMS was thorough. As well, it was important that Minolta staff feel comfortable with any new vendor, as the implementation of any large scale system requires a close and sometimes intense working relationship between client and vendor. Relationship building is a necessary skill in managing all successful large scale IT projects, and, therefore, any prospective supplier would have to be committed to getting to know Minolta at a deep level. Fortunately, the business consultant who Minolta staff had been working with understood the needs of the organization, and was able to facilitate the ultimate choice of a new LMS.

The new learning management system needed to be highly flexible. In any enterprise, constant change is a given, especially in the high-speed hypercompetitive atmosphere of the past decade or so. In addition, it was important that the new LMS be designed by educators, rather than "techies", so that it would conform to sound educational principles and practices.

It is not enough to trust vendor claims of their educational pedigree. The only way to verify how

a system will work is to try it out. Minolta staff fanned out to various e-learning shows and tried out a variety of learning management systems. As the new LMS was being reviewed, staff who tried it out then went out to different branches of the company to demonstrate its capabilities.

The LMS that Konica Minolta eventually chose was LearnFlex™, an adaptable full-featured learning management system from Operitel Corporation in Peterborough, Ontario, Canada (full disclosure: the second author works for Operitel). LearnFlex™ had all the mandatory features listed above, and most of the optional ones as well. In addition, it had a few unique wrinkles of its own – for example, capabilities for multiple languages (changeable on the fly), the ability to fine tune the "contextual language" of the navigation interface to conform to local usage, the ability to change "look and feel" for various communities using the same system, support for conferences and workshops, grouping of courses into diplomas or certificates, and the ability to enter and change a variety of "business rules" that impact on the usage of the system. LearnFlex™ integrated with a wide variety of authoring tools, and supported industry standards such as AICC and SCORM.

LearnFlex™ is a fourth generation LMS that started with the building of a learning management web site for a Canadian bank in 1998. Originally conceived by two university educators, this software is designed to launch and track a wide variety of online learning activities and courses. Acquired by Operitel Corporation in 2001, LearnFlex™ has developed into a very flexible and comprehensive solution that was able to meet all of Minolta's documented requirements.

The flexibility of the new LMS was demonstrated when Konica Corporation merged with Minolta USA in 2003 to form Konica Minolta Inc., in the middle the installation and implementation of the LearnFlex™ system. New communities were added, the corporate branding changed, business rules were adjusted and legacy data migrated without any significant issues or delay in the project.

Process of implementing the new LMS

In order to have a successful implementation, both the client (Konica Minolta) and the vendor (Operitel) needed to have strong project management procedures in place. While e-learning project management is a relatively new field, there are already "best practices" that were followed in this implementation of a major learning management system. A list of what needed to be managed for implementation included the following:

- Formation of an executive steering group to manage the entire initiative, including vision and strategy
- Formation of a project management team for day to day management
- Requirements gathering exercise, including the development of "use cases" and a 200+ items questionnaire on specific needs of each business unit
- Development of a detailed specifications document
- Development of a comprehensive project plan
- Management of budgets
- Management of technology, including the software to be implemented and the hardware on which it will be installed
- Management of the expectations of end-users
- Planning for the uploading of content into the LMS
- Development of both print and online help and documentation for the system
- Change management procedures while the implementation is underway
- Management of all personnel involved in the project
- Testing and quality assurance procedures

Konica Minolta began by organizing an internal "virtual corporation" that included the executive team sponsoring the initiative, Konica Minolta IT and training staff, as well as representatives from the vendor. This group met online on a weekly basis throughout the project. Both the client and the vendor appointed project managers, who then worked closely together. The project managers made regular reports to the team.

The project was governed by the detailed specifications document and the project plan. The team tried to set realistic goals for the completion of the project, in spite of pressures to change the system as quickly as possible. A schedule was set, but had to be adjusted as the project progressed, something quite common in any IT implementation. Because of the high stakes involved, it was important not to pull the plug on the old system until the new system was in place, and shown to be working properly.

From the vendor's point of view, project management procedures included the appointment of a dedicated implementation team for the project, headed by Michael Skinner, an executive who has extensive technical, business, and change management experience. Konica Minolta staff members were considered part of the vendor's implementation team, and treated as such. Continual communications and the reduction of barriers between client and vendor greatly helped in delivering a successful implementation, in spite of the fact that the client was changing its business in significant ways throughout the project.

One of the reasons that Operitel was able to deliver software that met changing requirements, is that all its software is built to be highly adaptable. Changes are a matter of reconfiguring the many properties of a feature, rather than writing new custom code. This approach to software also means that future changes can easily be implemented for Konica Minolta's business. These changes in the LMS can be carried out by Konica Minolta staff with appropriate administrative privileges. This approach illustrates Operitel's business philosophy of transferring 100% of the knowledge of the business use of its software to a client's staff. Konica Minolta staff was given training in the easy-to-use administrative tools that come with the software.

All changes in the software are fully documented. When these is a need for a change that goes beyond the simple reconfiguration of the LMS, Konica Minolta staff fill out an online change request form. This goes into a central document repository, and is assigned a "ticket number" so that it can be tracked until the change is completed. Because changes often improve the usability of any software, change is seen as positive by both the vendor and the client.

Discussion

Two years after the implementation, the amount of e-learning at Konica Minolta has tripled, and the training department has changed from a cost center to a revenue generator. Courses on product use and maintenance are now sold to dealers and end users using the built-in e-commerce capabilities of the system. Competencies are being tracked, and related to sales and service performance measures. New communities and new courses and assessments are continually being added to the system by Konica Minolta staff. Now, there is no frustration or stress in delivering online training.

Most importantly, training is now in high demand, as thousands of users across the company see the value and possibilities of online training. With that comes a new vision for the future of training at Konica Minolta, and increased confidence of the staff that as they innovate their pedagogical methods, the LearnFlex system will evolve with them.

The right LMS can be an enabler, a "convivial" technology that empowers and enhances human capabilities. But, as experienced by Konica Minolta staff, implementing and using an LMS can also be a highly frustrating and negative experience. Getting the right enterprise technology to meet the needs of a business is key, but so is having a positive experience in managing the implementation of such a system.

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Chapter 24

When Worlds Collide: Project Management and the Collegial Culture

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Abstract: This chapter argues that the use of a project management approach to e-learning in higher education creates the potential for organizational conflict that threatens the sustainability and quality of e-learning. Project management is informed by a managerial organizational culture but the dominant organizational culture of universities is the collegial culture. This situation sets up the conditions for conflict and ultimately organizational restructuring that will make it difficult to continue to use a project management approach. Unless we are sensitive to the issues and take steps to avoid the problems that may arise, the future of the project management approach, and thus the sustainability of quality e-learning, in a university setting is not promising.

Key words: E-learning, project management, distance education, organizational culture, online learning, academic freedom

Modern distance education occupies a curious position in conventional higher education because it is industrial and managerial in nature yet it is embedded in institutions that are generally characterized as collegial. Developing and teaching distance education courses has been likened to a manufacturing assembly line in which the process is broken down into component parts and each is handled separately (Peters, 1994). While this analogy may be a bit extreme, the general principle of division of labour does apply as does the generally managerial approach to organizing the work involved in developing and delivering distance education.

This makes distance education an odd fit in conventional higher education institutions because this is an organizational context that generally resists management in the conventional sense. Instead it values a collegial organizational culture in which academics guard their autonomy and resist the notion of being managed or accepting direction. Distance education has thus always been a bit of a thorn in the side of higher education. Universities, in particular, have never been sure how it should be organized since it straddles disciplinary boundaries and the boundary between the academic and support worlds of the university.

With the growth of e-learning, this issue has become even more critical. E-learning, with its much greater emphasis on the use of costly technologies, depends even more heavily on the use of careful planning and the use of a managerial approach. Thus the potential for tension and conflict between the two organization cultures is even greater. In this chapter I will explore some of the issues that we face in attempting to use a project management approach to develop e-learning in conventional higher education institutions.

The E-Learning Continuum

To begin, I would like to explain what I mean by e-learning, because it is a term that is used to mean different things to different people. Without a clear understanding of the term, it will not be apparent why I suggest that project management is essential for the effective development and implementation of e-learning. For me, e-learning is a broad term that encompasses

a variety of educational contexts in which technology is used to enhance or facilitate learning. I find it useful to think of e-learning as a continuum, as illustrated in figure 1. Here we see fully face-to-face teaching at one extreme and fully distance teaching at the other extreme. E-learning describes all of these types of teaching and learning.

As we move along the continuum from fully face-to-face teaching, more and more technology is used to replace the face-to-face elements. Initially, this has very little impact on how teaching is organized because the technology is used primarily to enhance the face-to-face teaching. But as we move further along the continuum (from left to right) the nature of teaching and how it is organized is affected by the technology.

Somewhere around the middle of the continuum we have what is called mixed-mode teaching (blended or hybrid are other terms commonly used) where significant amounts of the face-to-face element are replaced by technology mediated teaching. Fewer class sessions are held as technology is used increasingly to deliver the teaching and to facilitate the learning. Once we reach the extreme right of the continuum, there is no longer any face-to-face teaching. All teaching is technology-mediated.

According to this framework, e-learning is that part of the continuum that begins when technology is used to replace some of the face-to-face teaching to the extreme right where it replaces it all. Accordingly, we can have what we call mixed-mode e-learning in which there is a combination of face-to-face and technology-mediated teaching or distance education e-learning in which all teaching and learning is done without teacher and learners ever meeting face-to-face. Note that, according to this understanding of e-learning, distance education is an overlapping concept that may or may not involve e-learning.

Three Types of E-Learning

A second framework for understanding e-learning comes from Zemsky and Massy (2004). This framework captures a diversity of understandings of e-learning in three fairly easy to understand categories.

E-learning as distance education

This refers to courses that are delivered entirely, or almost entirely, on the Internet. Massy & Zemsky (2004) suggest this is the most common understanding of e-learning but I think increasingly, e-learning is not seen as distance education but as any teaching that involves technology which is the second type of e-learning.

E-learning as electronically-mediated learning

This category includes any teaching or learning that is mediated by technology. Thus, products like computerized test preparation courses that prepare students to take the SAT, GRE, complex, integrated learning packages such as Maple or Mathematica that teach elementary calculus, learning objects that simulate and illustrate

various concepts such as chemical reactions, mathematical modeling, social interactions and musical compositions, and tools like Macromedia's Dreamweaver and Flash that students use to build their own websites. Interactive CD-ROMs and the websites of book publishers would be part of this category. What all these products and resources have in common is that they involve electronically mediated learning in a digital format that can be used as part of regular on-campus teaching. It is not necessarily distance education.

E-learning as facilitated transactions software

This category includes the software that is used to organize and manage teaching and learning, course management systems like the commercial products, BlackBoard and WebCT and open source products like Moodle. These course management systems link teachers with students, students with each other, and students to resources. Course content, schedules, assignments and other resources are uploaded to these systems for students to access. In addition, these systems allow for online testing.

As you can see, e-learning can be quite broadly defined to include a range of different educational contexts and it can have fairly narrow technical definition, as in the case of facilitated transactions software, to a very pedagogical definition, as in the case of distance education. For the purposes of this discussion, my focus will be primarily on e-learning as distance education although some of what I have to say is also applicable to mixed-mode e-learning.

Academic Cultures

Bergquist (1992) suggests that life in conventional universities is governed by four distinct but related organizational cultures that are often operating simultaneously. He argues that these cultures profoundly affect how faculty, staff, students and administrators view and carry out their roles and how the institutions are organized. He calls the four cultures *collegial, managerial, developmental* and *negotiated*. For the purposes of this discussion, the collegial and managerial cultures are the most relevant.

The Collegial Culture

In the collegial culture the autonomous faculty member reigns supreme. She or he is driven by the pursuit of knowledge. The notion of measurable outcomes and accountability are resisted and academic freedom is the guiding principle. Governance processes are faculty-driven and controlled, and institutional change takes place slowly. While it has many strengths such as they way in which it encourages deliberation and open communication, the collegial culture lacks organization and coherence. (Bergquist, 1992).

The Managerial Culture

The managerial culture is defined primarily in structural terms. Work is organized and directed toward specific goals. Evaluation and accountability are highly valued as are fiscal responsibility and effective supervisory skills. The managerial culture has had a profound impact on college and university campuses. Governments have increasingly demanded greater accountability from public universities and colleges (at the same time as they reduced funding) which forced these institutions to engage in the kind of planning and organization that is commonplace in business but largely foreign to the collegial culture.

Project Management

Project management has been well-defined and discussed elsewhere in this book so I will not go into detail. For the purposes of this discussion, I find the following brief definition useful. "The process of leading, planning, organising, staffing and controlling activities, people and other resources in order to achieve particular objectives"(International Fund for Agricultural Development, 2005). I like this definition because it highlights the key issues that clearly place it in the realm of the managerial culture and it clearly suggests why it might create conflicts with a collegial culture. Leading, planning, organizing and controlling are all activities that are *not* highly valued in a collegial culture.

Project management and e-learning go hand in hand. While other approaches are used to develop and implement e-learning, there is a consensus in the literature that to be sustainable, cost-effective and of high quality, a project management approach is needed (Bates, 2000). However, despite the growth in the influence of the managerial culture in universities and colleges, the collegial culture still dominates academic life of these institutions. E-learning is clearly an academic activity, but it is managed by professionals who work in a managerial culture. Thus we have academics who work according to the values and beliefs of a collegial culture working with professional instructional designers and

technical staff who inhabit a world governed by values and beliefs of the managerial culture. This creates the potential for conflict.

Issues

The implications of this cultural clash are quite significant and the problems that arise can be exacerbated if individuals involved in situations where the two cultures overlap are not aware of, and sensitive to, the cultural differences. The most obvious source of conflict will be the attempt to manage faculty members. Bergquist's (1992) description of the collegial culture clearly highlights the issue. "In the collegial culture major emphasis is placed on independent work. Typically, faculty members labor alone on projects, teach by themselves in the classroom, and plan curriculum and courses in isolation from their colleagues" (p. 43). Contrast this with his description of the managerial culture: "a culture that finds meaning primarily in the organization, implementation, and evaluation of work that is directed toward specified goals and purposes; that values fiscal responsibility and effective supervisory skills" (p. 5).

Clearly, project management as a process of leading, planning, organizing, staffing and controlling activities, people and other resources in order to achieve particular objectives is informed by the kind of managerial culture that Bergquist identifies. Furthermore the university departments that support e-learning project development tend to be informed by a managerial culture and a cost-recovery financial model, organized hierarchically, and staffed by non-faculty employees who are managed and supervised.

Managing Faculty Members

The amount of control that project managers can exert over faculty members who are involved in an e-learning project, then, is quite limited. It is limited because the faculty members usually work in a different organizational unit in the university (and thus the project managers have no direct authority over the faculty members) and because they work according to the values of a different organizational culture. This means that deadlines, deliverables and expectations must be negotiated and that creativity must be used in getting faculty members to fulfill their responsibilities. Ultimately, there is little the project manager can do if the faculty member doesn't produce.

While e-learning project managers may not have any direct line authority over faculty members involved in e-learning projects, they can influence how the faculty member performs. It requires creativity and an approach that is much more subtle than one traditionally finds in project management. The first thing is to be aware of this profound cultural difference and to understand that the faculty member works according to a completely different set of values. Attempting to coerce faculty member to produce using threats and ultimatums will usually be counterproductive. Instead the following steps are suggested:

1. Ensure that the faculty member is fully aware of his or her responsibilities before the project even begins.
2. Negotiate the deadlines and deliverables with the faculty member to ensure that they are practical and will not conflict with other responsibilities he or she may have.
3. Impress on the faculty member that the deadlines are critical to the effective functioning of the project team. If he or she doesn't meet his or her deadlines it has a ripple effect on everybody else involved on the project.
4. Make sure the academic department head is involved and aware of the project, the deadlines and the faculty member's responsibilities.
5. If the faculty member is being paid an honorarium for his work on the project, make sure payments are tied to the completion of specific phases. This is about the only "stick" the project manager has.
6. Stay in touch with the faculty member. Don't wait until the deadline to check up on progress. Constant monitoring will help avoid missed deadlines or poor quality work that has been produced at the last minute to meet an impending deadline.
7. Lead by example. When the faculty member submits work, be sure to respond quickly with your feedback.
8. Break the project up into small steps or phases. This not only makes the project psychologically easier to tackle for the faculty member, it also provides you with more opportunities to provide feedback and guide the process.

Academic Freedom

A more significant and serious issue that threatens to derail the project management process completely is related to academic freedom. Academic freedom is a fundamental tenet of the collegial culture. According to Millet (1962), it is rooted in the unique relationship between higher education and society.

> Higher education is dangerous. It carries with it at all times the possibility that it may upset an existing power structure in society. It carries with it at all times the possibility that individuals and institutions in society may have to accept new ideas and news of behavior" (p. 56).

Academic freedom allows faculty to pursue their research and teaching without interference or influence. It serves to protect the faculty member from outside pressure and it is seen as essential to safeguard society and the academy.

Academic freedom may seem like an issue far removed from the mundane considerations of project management but it is emerging as one of the key conflict-producing features of the collegial culture that is threatening the ability of universities to use a project management approach to e-learning development. The conflict occurs because the e-learning course development model used by most universities involves faculty members assigning copyright to e-learning courses to their institutions. The specifics vary from institution to institution. At the University of British Columbia, for example, copyright has been "unbundled" or divided into "author materials" and "course materials". Faculty members retain ownership of any material they produced on their own before the start of the e-learning project. The university claims ownership of the course as a collective work. Faculty members, faculty unions and the Canadian Association of University Teachers have equated this as an attack on academic freedom because, unlike face-to-face courses, the university will own the e-learning course and thus potentially be able to influence how and what the faculty member teaches and how that material is used in the future.

Cynics may argue that outraged faculty members are really more concerned about the loss of potential profits from the sale of e-learning courses than they are about upholding the virtues of academic freedom. Nonetheless this issue has moved to centre stage in many North American universities. At UBC, the Faculty Association recently won an arbitration before the Labour Relations Board over the issue. Faculty members can no longer be required to sign agreements outside of their collective agreement related to the development of e-learning courses. One of the key issues covered in these agreements is copyright. Scratch below the surface, however, and what we see again is the collegial culture colliding with the managerial culture. Stephen Petrina has championed this issue at the University of British Columbia and astutely points out that the university has taken on the role of a publisher: "when a university assumes the role of 'publisher' of on-line courses, faculty members are little more than widget makers in the process. The publishing factory is in fact the model that university lawyers are adopting" (Petrina, 2003, p. 9). Petrina is, of course, overstating how poorly treated faculty are in this process. They are much more than widget-makers. They have full academic control of the course and they have access to and support from a team of pedagogical and technical support staff. However, he is quite correct in his assertion that the organizational model (and the underlying organizational culture) is significantly different.

This issue will not be resolved easily, but if it is not resolved it threatens the ability of universities to produce sustainable and cost-effective e-learning. E-learning has high up-front costs that are only feasible if they can be amortized over several years of offering an online course without substantial changes. If faculty members retain full ownership over e-learning courses and other faculty members are not permitted to teach those courses without permission from the faculty member(s) who originally developed the course, universities may not be able to achieve the cost efficiencies of amortizing the up front costs over several offerings.

What happens, for example, when the faculty member who developed the e-learning course goes on sabbatical or leaves the university? Allowing a faculty member to determine who teaches an e-learning course effectively removes any managerial authority of the university over teaching assignments. If this notion of copyright and academic freedom is accepted, the faculty member/e-learning course creator would effectively be able to determine who teaches that course unless the university wanted to develop a new version of the course for each faculty member who was assigned to teach it.

Organizational Implications

The implications for how universities organize to develop and support e-learning are significant. While organizational theorists tend to agree that multiple organizational cultures can co-exist in universities, there is also general agreement that the collegial culture still dominates. Thus we have a dominant culture that values the independence and autonomy of the individual faculty members, who resist the notion of hierarchy and accountability. In fact they consider themselves accountable only to themselves and to their disciplines.

However, when faculty members come to work on an e-learning project they are entering a different reality, one that is governed by a managerial culture in which work is organized very differently, which emphasizes accountability, deadlines, organization and collaboration. One of the major sources of conflict in organizations occurs when people do not share the same values and perceptions of reality (Thompson, 1961) I have discussed the implications of this conflict for the project management process. But, it also has an impact on how universities organize for e-learning because an organization that has these two fundamentally different cultures sets itself up for conflict. Eventually, change must occur, as the organization attempts to eliminate the conflict and restore balance. In practice, what this often means is that an organizational restructuring occurs to ensure that the dominant culture holds sway.

More often than not, what this organizational restructuring looks like is the downsizing or complete elimination of e-learning support units that are not based in faculties. The most recent example of this in Canadian higher education has just taken place at the University of British Columbia. Since 1949, UBC has had a central support department for distance education development and delivery. With the emergence of web-based instruction in the late 1990s, this department quickly reinvented itself as an e-learning support unit and developed an international reputation for its e-learning expertise in instructional design, planning and management of e-learning and learner support. However, in June 2004, after a protracted review process that began in 2002, the university decided to close the department and decentralize all staff and services to the faculties.

Arguments for the economies of scale that are realized by concentrating resources were ignored as were the arguments for the synergies that develop by concentrating professionals in "centres of excellence". The stated rationale for this restructuring reveals the power of the collegial culture and supports the premise that when this dominant culture comes into conflict with the alien managerial culture, it will reassert its dominance through restructuring. The Academic Vice-President at the time stated "In sustaining...e-learning growth...strong faculty involvement in essential. Over the next months we will be looking for new organizational alignments that links the strengths of ...[the central e-learning department]...with the faculties (McBride, 2003)."

The implications of this rationale are that the restructuring was needed because faculties were not involved in the development and delivery of e-learning, that they had somehow been cut out of the process and need to reestablish their control over this, primarily, academic activity. In fact, faculties controlled the funding and priority-setting process through an advisory council. All faculties had access to earmarked e-learning funds and could determine which programs they chose to develop. What they didn't have, however, was direct control over the management of the development process because Distance Education & Technology was a central support unit that was not part of a faculty. And because Distance Education & Technology operated according to managerial principles, it tended to provoke the kind of conflict mentioned earlier when realities are not shared. Thus, the scene was set for a restructuring, particularly as e-learning grew in importance.

The Future of Project Management in the Collegial Culture

I have argued that a project management approach is essential for the development of high quality, cost-effective and sustainable e-learning courses and programs but that the organizational culture that informs this approach is at odds with the dominant culture of our universities. While multiple cultures co-exist in most universities, the collegial culture still tends to provide the lens through which university faculty see their world. It is a culture that values independence and autonomy and eschews direction and accountability. As Bergquist (1992) observed,

> ...for many faculty members, one of the most attractive features of the collegial culture is this tolerance for and even encouragement

> of autonomous activity. Whereas the other three academic cultures...reinforce collaboration and corporate activity, the collegial culture nurtures the 'lone wolf', the 'eccentric', and the socially oblivious 'absent-minded professor' in a manner that is unique to American higher education (p. 43).

Thus we have two groups of people with differing realities and a "disconnect" between two fundamentally different cultures: the faculty members who inhabit the collegial world and the e-learning support staff who live in the managerial world. This situation sets up the conditions for conflict and ultimately organizational restructuring that will make it difficult to continue to use a project management approach.

The picture I have painted is admittedly grim. But, unless we are sensitive to the issues and take steps to avoid the problems that may arise, the future of the project management approach, and thus the sustainability of quality e-learning, in a university setting is not promising.

I have already made some suggestions for how to manage faculty in a way that both respects the cultural differences and is sensitive to the fact that world views differ. These are short term tactical solutions that can stave off the bigger problem of organizational restructuring leading to decentralization and the elimination of the professional approach to e-learning development. The more critical decision is how to deal with this issue strategically, to prevent serious organizational conflict from developing that will threaten the existence of the central e-learning support unit and the project management approach. There are no easy answers to this, no formula to follow that will prevent this outcome. However, there are some steps that I believe may help.

First, it is essential that an e-learning support unit that is not located within a faculty establish strong relationships with the faculties at the senior, decision-making levels. Faculties have to feel that they have ownership and control over e-learning. This means making the key academic decisions and setting priorities. Deans and Associate Deans must be aware of the e-learning activity in their faculties, understand how it contributes to their missions, and how they benefit financially and academically by participating in e-learning projects. If e-learning is seen as something that happens somewhere else, that faculties do not control, it will become a prime target for takeover by faculties. There are a number of ways of achieving this and they will vary depending on the particular university context. Advisory committees that have faculty representation from faculties and that meet regularly to discuss e-learning issues, set priorities, and allocate resources are an excellent way to ensure that faculties are involved. However more is needed. E-learning has to become part of the fabric of the faculty, not an optional extra only engaged in by a few enthusiasts. Development and teaching of e-learning courses need to be part of the regular faculty load. Achieving this will require working with Deans and Associate Deans to educate them about what e-learning is and how it can contribute to the academic plans of the faculties.

Second, there needs to be awareness and understanding of the significance of the academic freedom issue and how sacrosanct this concept is for faculty members. It is one of the dominant pillars of collegial culture and a defining characteristic of academicians that sets them apart from other professionals. While we may not agree with how the issue is being applied to intellectual property in e-learning courses, we have to acknowledge that many faculty members resist the notion that anything they produce as part of their academic work should be signed over to the university. However, as I have already outlined, unless the institution has some flexibility in the use of e-learning material, it will not be able to achieve the cost efficiencies that are necessary to make high quality e-learning sustainable. Thus, finding a solution to this issue will not be easy.

However, the first step is to acknowledge the legitimacy of the faculty members' position and to try to find solutions that will respect their rights while preserving some flexibility for the institution. The University of British Columbia came up with the idea of differentiating the rights according to author materials and course materials, which they saw as a creative solution. However, some faculty members have rejected this 'unbundlling' as just a disguised attempt to get at the intellectual property of faculty members. Clearly, then, creativity will be needed in devising strategies to deal with this issue.

Finally, e-learning support units have to embrace change themselves and resist the temptation to assume that the way they have done things in the past is the only way. Highly centralized, professionalized support units that tend to treat e-learning development as an

industrial process will be resisted by most faculty members because this approach is not consistent with their world view. As Bergquist (1962) notes, the faculty member

> ...has little regard for or patience with systematic planning processes advocated by proponents of the 'rationalistic' culture. The step-by-step analysis of a personnel or curriculum problem is considered inappropriate. ....The rationalistic culture will deeply penetrate other aspects of society long before it has widespread and enduring impact on the faculty and collegially oriented administrators of our academic institutions (p. 47).

Even though the classroom is essentially a public arena, faculty members tend to view teaching as a private exchange between themselves and their students. There is a strong resistance to the notion of observation or the idea that teaching can be improved through sharing experiences and developmental activities. Millet's (1962) observations from over 40 years ago still ring true,

> ...the scholar wants to be left alone in the conduct of the academic enterprise. He does not welcome innovation in instructional procedures, in instructional arrangements, or in the organization and operation of a college or university...The scholar is conservative in his attitude toward and appreciation of the academic process." (p. 104).

What this means, then, is that e-learning support units have to be sensitive to this world view and adapt their processes accordingly. This does not mean abandoning the project management approach but it does mean smoothing its managerial edges, building in flexibility, avoiding the use of overly managerial terminology and, above all, ensuring that the faculty member feels in control of the process. It also means that e-learning support units need to re-examine their procedures and organizational structure to ensure that they are properly integrated into the academic core of the university. This may mean devising new and innovative organizational structures that blend features of centralization with faculty-based support. The danger is that if these new structures are not developed that the conflict that develops from the clash of cultures will generate pressure to fully decentralize and thus eliminate professionalism in e-learning development.

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CeLEA
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Canadian eLearning Enterprise Alliance
Alliance canadienne des enterprises en eLearning

The **Canadian eLearning Enterprise Alliance (CeLEA)** is an industry-based organization established in 2003 to help Canadian elearning companies increase their share of revenues from the growing global elearning market place.

As the ***only*** organization in Canada focused solely on the commercial elearning sector, we play a key role in fostering communication between industry, government, and other stakeholders in the elearning industry in Canada and abroad, with the ultimate goal of identifying and communicating business opportunities, and helping Canadian companies successfully compete for those opportunities.

CeLEA is committed to strengthening our industry members by:

- Marketing and promoting our member companies and organizations, and the Canadian eLearning industry in general, in both domestic and international markets;
- Identifying and communicating potential elearning business development opportunities to our members;
- Facilitating networking and the formation of business relationships between members to pursue selected business opportunities;
- Advocating, where appropriate, on behalf of our members for a favourable business development environment in Canada.

For more information on CeLEA, please visit our website at www.celea-aceel.ca, or contact us at 902.488.6326.

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Ancora imparo. – M.B.