E-Learning Report 2005:
A Foundation for Transformation

Final Version (3.0)

November 1, 2005

Seven principles of good teaching practice in undergraduate education...

- *encourages contact between students and faculty,*
- *develops reciprocity and cooperation among students,*
- *encourages active learning,*
- *gives prompt feedback,*
- *emphasizes time on task,*
- *communicates high expectations, and*
- *respects diverse talents and ways of learning.*

Report Versions & Changes

Version 1.0 published on June 15, 2005
Version 2.0 published on September 1, 2005

Changes included in Version 1.2

- Glossary included (p. 13)
- Expanded Introduction (p. 15)
- Research revenues included (p. 18)
- Revision to description of learning content management systems (p. 43)
- Recommendation 9 has been revised to reflect existing planning processes (pp. 9, 44, 55)
- Evaluating Outcomes theme expanded to include methods for studying learning outcomes (p. 45)
- Correction to UTS start date (p. 66)
- Updated information about Agriculture, Forestry and Home Economics (p. 70)

Changes included in Version 2.0

- E-learning is positioned within the broader educational context (pp. 5, 23)
- Evolving nature of basic skills added as a factor (pp. 6, 16)
- Recommendation 6: #1 is simplified (pp. 8, 42, 54)
- Recommendation 10: Refresh cycle to match specific technology (pp. 9, 44, 56)
- Recommendation 15: Ensure broad representation on council (pp. 11, 48, 59)
- Recommendation 17: Include representatives from NASA and SU (pp. 11, 49, 60)
- Expanded definition of active learning (pp. 12, 40)
- Reasons for using blended learning (pp. 22-23)
- Future research on U of A e-learning support (p. 31)
- E-learning as an investment (p. 38)
- Flexible approaches to professional development are important (p. 38)
- The relationship between Recommendations 2 and 3 (p. 39)
- Recommendation 3 incentive is explained (p. 39)
- Expanded definition of learning objects with examples (pp. 40-41)
- Need for regular studies of campus practices (pp. 45, 48)
- Using academic themes as selection criteria for Recommendation 3 (p. 51)
- 5 or more projects possible (p. 52)
- FEC evaluation suggestions for e-learning projects (pp. 59-60)
- Faculty of Law description now included (p. 73)
- Computer and Network Services (CNS) changed to Academic Information and Communications Technologies (AICT) throughout

Changes included in Final Version (3.0)

Diagram of recommendations and e-learning support system
A diagram has been included that illustrates the manner in which the E-Learning Report recommendations create a integrated system of support to enhance of learning and teaching.
 (p. 14)

Teaching and learning (Recommendation 1)
E-learning is defined as a "tool." Also, it is explained that the effectiveness of e-learning is determined by the way that it is utilized. The concept of active learning is clarified to ensure that it is evident that it is not dependent upon using e-learning. A flexible approach is emphasized in which e-learning may be used in combination with more traditional approaches. (pp. 15, 41, 42)

Limited time and inherent trade-offs (Recommendations 1 & 2)
Although many faculty members are interested in using e-learning, they are concerned about the increased workload required and its affect on their research. The importance of time efficient support systems and professional development programs is stressed in this version. Also, the relationship between special projects and Faculty-based instructional development teams in reducing the workload of instructors is explained. (pp. 41, 42)

Instructor incentives (Recommendation 3)
Given that the "incentives" pertained to special projects funding, the wording of the Recommendation 3 has been changed to reflect this. Implementation guidelines now include funding smaller projects, and applying selection criteria that are aligned with University priorities as determined by the Academic Plan that is currently under development.
(p. 42)

Orienting learners to information literacy & active learning (Recommendation 4)
Recommendation 4 is revised to state that Faculties will be "strongly encouraged" as opposed to required to "ensure" that students are capable of successful participation as active learners. This change is in recognition that it will be difficult to ensure that all learners will be competent in information literacy and active learning. (p. 44)

Responsive support (Recommendation 6)
The critical role of reliable WebCT services and robust user support systems is emphasized in this version. A statement is added about the need for soliciting feedback from users and involving stakeholder groups in selecting applications, identifying discipline-specific requirements, and choosing when to upgrade. It also is proposed that costs, benefits, and risks of e-learning support technology will be assessed annually by AICT working in collaboration with stakeholder groups. (p. 47)

Instructor and student diversity (Recommendations 6 & 15)
The need for responsive support and professional development programs for diverse populations of users is elaborated upon in this version. AICT is asked to consider Universal design principles and work closely with Specialized Support and Disability

Services (SSDS). The Teaching, Learning, and Technology Council membership will be expanded to include representatives for instructors less familiar with e-learning, sessionals, and representatives from Student Services. (pp. 45, 46, 53, 54)

The FEC process (Recommendations 16)
Faculty members using e-learning risk receiving negative student ratings should they have trouble with using the technology. Because of their fear of facing a negative review by FEC, faculty sometimes are reluctant to use e-learning. Existing FEC guidelines have been found by many to be unclear or too narrowly defined especially with respect to those faculty using e-learning. It is recommended that Faculties develop FEC guidelines and processes for evaluating the quality of teaching that incorporates e-learning. (pp 53, 54)

Learning spaces (Recommendation 8 & 9)
Money allocated for installing technology in existing classrooms is not always utilized each year because necessary facility renovations have not been completed. The need to review the FAR funding processes is indicated in this version of the report. Also, students now are included in the planning process. (pp. 48, 49, 61)

Appendices
Appendix H: University of Alberta Libraries' support for e-learning was added on pages 98 and 99

Appendix I: Information about University of Alberta International: International Projects has been added on page 100.

Consultative review process

An extensive and collaborative process has been used to review the Versions 1.0 and 2.0 of the E-Learning Report. This process included written responses from stakeholder organizations, participation in an online survey, in-person interviews with Deans, and discussions during University committee meetings. The feedback received from these sources has been invaluable for ensuring that this report is responsive to University needs. The schedule and details of this collaboration are outlined below.

E-Learning Report	Feedback method	Participants & dates
Version 1.0	Committee discussion	Committee on Learning Environments (June 1) Academic Advisory Group (June 6)
	Written feedback (initiated by the respondent)	Faculty of Arts Faculty of Extension University Libraries Specialized Support and Disability Services University of Alberta International
Version 2.0	Online Survey In-person interview Committee discussion	64 faculty and staff responded (July & August) Faculty Deans (August & September) Academic Advisory Group (Sept. 13) Pres. Advisory Comm. of Chairs (Sept. 13) Strategic Initiatives Group (Sept. 13) Executive Planning Comm. (Sept. 20) Arts Chairs Council (Sept. 21) Committee on Learning Environments (Oct. 5) GFC Academic Planning Comm. (Oct. 12) Deans' Council (Nov. 2)

E-Learning Plan Development Working Committee

Terms of Reference

The Vice-Provost (Information Technology) will chair the committee.
Advisory Committee is to report to the Provost and Vice-President (Academic) and APC (Academic Planning Committee). Main activities are to:

- Discuss and make recommendations related to the current goal statements of the University as they relate to e-learning and e-learning support.

- Review and assess the current e-learning support structure in terms of how well it is supporting the enunciated goals.

- Develop a plan that includes recommendations about how the University should support e-learning.

- Committee will be disbanded upon the completion of the report.

The Office of the Provost and Vice-President (Academic) would like to acknowledge and thank the following committee members for their considerable efforts in the development of this report.

Committee Members

AgFor & Home Economics:	Brett Finch
Arts:	Grace Wiebe
Augustana:	John Hoddinott
Business:	Mike Getz
Education:	Mike Carbonaro
Engineering:	Kumar Nandakumar
Extension:	Katy Campbell
Faculté St. Jean:	John Boeglin
Graduate Studies & Research:	Margaret Haughey
Law:	Salim Kassam
Medicine & Dentistry:	David Rayner/James Yacyshyn
Native Studies:	Nathalie Kermoal/Brenda Parlee
Nursing:	Wendy Caplan
Rehabilitation Medicine:	David Magee
Science:	Osmar Zaïane
AICT:	Steve Thornton/Susan Stein
ICT Committee:	Connie Varnhagen/Ann McDougall
Learning Systems:	Doug Poff
Office of the Registrar:	Dorte Sheikh
Students' Union:	Lisa McLaughlin/Amanda Henry
UTS:	Bente Roed

Office of the Provost and Vice-President (Academic)
Paul Sorenson, Vice-Provost (Information Technology)
Sandra Dowie, E-Learning Development Officer
Rob Lake, Information Technology Planning and Forecasting Officer

Contents

Executive Summary

E-Learning Report 2005: A Foundation for Transformation provides a vision and a foundation for a planning process to stimulate ongoing dialogue and constructive change in the University of Alberta as we strive to make the best use of information and communications technologies in support of learning. The recommendations in the report build on years of experience and dedicated effort by many faculty and staff, several of whom participated on the E-Learning Plan Development Working Committee that generated the report. Committee members collaborated diligently on crafting this report during a five-month period from February to June 2005.

The report responds to the *External Review of the University of Alberta E-Learning Support Units,* which recommended the development of a vision and a strategic direction for e-learning with agreed-on measures and targets. The overarching purpose of the recommendations and strategies in this report is to establish a network of people and sustainable processes that will create an outstanding learning environment for our students, who are the leaders of tomorrow.

E-Learning in Higher Education

E-learning is generally regarded as using information and communications technologies for teaching and learning. These technologies may include, but are not limited to, the following: presentation technologies (e.g., PowerPoint), the Internet, videoconferencing, e-mail, specialist disciplinary software, learning management systems such as WebCT, simulations, and educational games. E-learning may involve such hardware as computers, personal digital assistants, and cell phones. The media used can combine audio, video, images, and text in a variety of combinations and using a range of approaches.

E-learning should be regarded as a facility or set of tools, not a particular teaching method. Indeed, e-learning may be used to support almost any kind of instructional approach, positive or negative. Examples of using e-learning constructively include approaches which combine more traditional teaching practices with information and communications technologies. For example, an instructor might use the Internet during his or her lecture to access online animations that supplement the class presentation. A course website might contain activities that facilitate active learning. Communications applications such as online discussions groups might be used to enable collaborative problem solving among groups of students who have difficulty scheduling meetings. Instructors of fully online courses typically use little if any face-to-face instruction and depend almost entirely on e-learning.

The degree to which e-learning is used by instructors varies widely due to a number of factors including their personal teaching preferences, the nature of the subject matter, the students involved as well as the availability of technical and instructional design support. Quality instruction remains the paramount goal and e-learning should never be used for its own sake.

The E-Learning Committee identified the following factors that contribute to the need to transform teaching and learning in higher education:

- evolving nature of "basic skills" required to be competent professionals

- the opportunities provided by the increased effectiveness and reduced costs of information and communications technologies;

- pervasive use of information technology by students leading to changes in learning preferences;

- synergy of teaching and research;

- growing demand for alternative learning models to improve learning and increase accessibility;

- greater availability of electronic learning resources and scholarly publications.

The combined effects of these six factors make it paramount for the University to reevaluate and update its strategy for e-learning.

E-learning enables greater flexibility in terms of where and when students can participate in learning activities. As a result, those involved in discussing the advantages of using e-learning often concentrated on how it reduces barriers to accessing educational programs. However, from a pedagogical point of view, the focus of e-learning is not on access, but on learning. E-learning provides learners with the opportunity to be more active and to take greater responsibility for their own learning. It also gives faculty a wider variety of tools for facilitating participation and collaboration.

The *E-Learning Report* exists in the context established by the vision, mission, and goals of the University. Information and communications technologies are praised for their capacity to span distance, connect communities, provide information, and rapidly transmit huge volumes of data. E-learning is an integrated application of these technologies. As such it has the potential to influence how all the academic themes of the University are realized, a point that is made clearly in the report.

Outline of the Report

The report comprises six sections. After the introduction, the second section traces the earlier efforts of the University to build both expertise and technological capability in e-learning. The third section explores the strong relationship between this plan and the academic plan currently being developed. The planning committee believes that the recommendations from this plan must carry significant weight in the University's plan. Otherwise the plan will have missed its mark, and this may jeopardize the future of our institution. The fourth section presents the important themes and associated recommendations identified during the committee's deliberations. The fifth section outlines the strategies, and where appropriate the estimated costs, of implementing the strategies for the recommendations identified in the previous section. The final section briefly summarizes the document and draws some conclusions. Appendices present

additional background information or more details related to the discussion and recommendations in the body of the report.

Below are listed the major recommendations of the report. Although each recommendation has been written to be understandable without significant context, for some it may be necessary for the reader to read the appropriate section in the body of the report in order to comprehend fully the rationale for the particular recommendation. To assist in this process, the page number for discussion related to each recommendation is provided.

E-Learning Themes and Recommendations

The E-Learning Plan Development Working Committee identified 13 themes as a framework for planning e-learning in the University. Each theme has one or more recommendations, which have related strategies. To implement these strategies, the University will need to invest approximately $3.5 million a year by the fourth year of the plan.

Learning Environments for Tomorrow's Leaders

Recommendation 1 (page 44)
Existing University-wide professional development programs and Web-based resources should be expanded to guide increasingly larger numbers of instructors as they implement active learning methods, incorporate digital resources, and explore the capabilities of e-learning technologies. These professional development programs will also augment the knowledge and skills of faculty-based e-learning support staff as well as graduate students involved in teaching.

Recommendation 2 (page 44)
Through a combination of central support services and faculty-based support, instructors will receive the technical and instructional design support necessary to implement efficiently active learning strategies and e-learning in their courses.

Recommendations 1 and 2 provide a basis for incrementally transforming our learning environments, but are not sufficient to move the University forward quickly. Real learning innovation and change will be promoted through special project funding which will serve to stimulate the transformation of courses and programs. Special projects will involve cross-functional teams composed of instructors and e-learning specialists. In this way, time efficiencies will be created and the individual workload for each instructor will be reduced.

Recommendation 3 (page 45)
A special projects fund will be created to support the transformation of learning in areas where significant gains can be made in terms of enhancing learning.

Preparing Our Learners for Success

Recommendation 4 (Page 46)
Each Faculty is strongly encouraged to ensure that students are capable of successful participation as active learners and that they have essential information literacy skills. Related educational programs and resources will incorporate active learning strategies. A University-level working group will be established to explore ways of providing core introductory instruction or resources on active learning and information literacy that would serve as a foundation for Faculty programs.

Acquiring and Creating Sustainable Educational Resources

Recommendation 5 (Page 47)
All instructors should be able effectively to identify, acquire, and integrate learning objects. This will be achieved through a combination of enhanced professional development activities about digital resources and the ongoing support of e-learning specialists. The University also will undertake selected projects in conjunction with Faculties that demonstrate the sustainable production, acquisition, and maintenance of learning resources.

Responsive Support

Recommendation 6 (Page 48)
In order to provide quality support and performance for e-learning systems, AICT will be asked to develop:
1. *reliable and responsive WebCT services;*

2. *a technology roadmap of future WebCT product offerings and how the University might take advantage of these;*

3. *a strategy to engage e-learning support personnel in departments and faculties in WebCT course creation and support;*

4. *plans for new or additional training required to support the WebCT roadmap;*

5. *risk assessment of our strategy to support primarily a single vendor product;*

6. *the benefits and costs of supporting alternative open-source products (e.g., sakai or moodle) in addition to WebCT;*

7. *a process for scanning broadly ranging University needs for information and communications technologies and for planning the evolution of e-learning support.*

8. *a plan for collaborating with Specialized Support and Disability services to ensure that Universal design principles are applied to all AICT supported courses.*

Research and Development of Campus-Wide Solutions

Recommendation 7 (Page 49)
The University will establish a strategy for collaborating with instructors and e-learning support staff to research, evaluate, and where appropriate recommend campus-wide implementation of new educational technologies and applications as part of cultivating superior learning environments and a spirit of innovation in teaching and learning.

Planning Learning Spaces

Recommendation 8 (Page 49)
Building planners will collaborate with Faculties in the early stages to explore designs that are conducive to active learning and adaptable to future changes in educational practices. Processes will be reviewed to ensure that decisions about the design, maintenance, and renewal of classroom technologies will involve academic representatives as well as technical specialists. Before the new or renovated facilities are completed, the University will involve instructors and students in researching, developing, and evaluating instructional strategies that will make optimal use of the new teaching spaces.

Recommendation 9 (Page 50)
The existing committee (TEISAC) responsible for central computing labs will address the evolving campus-wide requirements for technology in the computing labs. Working with Planning and Infrastructure, the Vice-Provost (Information Technology) will review the process for upgrading classrooms to ensure that optimal use is made of existing funding allocated to upgrading the technology in classrooms and FAR (Facilities Alterations Requests) funding. If possible, an ongoing sustainable fund for infrastructure upgrades in smart classrooms will be established.

Recommendation 10 (Page 50)
The importance and use of information technology in support of teaching and learning, research, and administration is growing rapidly, and so the costs of installing and refreshing information technology must be considered in the initial costs of construction and the ongoing maintenance of a building. These costs should not be treated as an afterthought late in the construction phase, and a refresh cycle appropriate to the technology must be planned with adequate funding support.

Evaluating Outcomes

Recommendation 11 (Page 51)
Instructional strategies used to incorporate e-learning should be tracked and evaluated to determine their effectiveness in improving learning outcomes, while containing costs. It is recognized that although it is desirable to reduce costs, learning outcomes must be

maintained or improved. During this process, it will be recognized that instructors who explore new instructional methods require time and appropriate support to develop, pilot, and revise their practice.

Integrating Teaching and Research

Recommendation 12 (Page 52)
The recommendations of the report "Integrating Research and Teaching at the University of Alberta: Creating a Foundation for an Inquiry-Based Life" should be reviewed. Those recommendations that are selected should be implemented in conjunction with the recommendations of this report to ensure that an e-learning plan that supports the integration of teaching and research on campus be developed and evolved.

Committing to Online Programs

Recommendation 13 (Page 53)
The unique needs of University online programs serving students at a distance require centrally provided e-learning support services that are flexible and robust. Services should include:
1. *extended hours of help-desk support for instructors and students, which may include evenings and weekends;*
2. *centrally supported high-performance synchronous communication tools;*
3. *service-level provisions for high system availability and performance on weekends and times such as Reading Week when on-campus students may be away from class.*

Sufficient resources must be provided to meet these needs. The University should state its commitment to ensuring the ongoing success of online learning programs.

Achieving Leadership in Learning

Recommendation 14 (Pages 53-54)
A concept proposal for a Centre of Creative Learning Initiatives (CCLI) will be developed as soon as possible, with a completion date of no later than January 30, 2006 The overall goal is to have a comprehensive CCLI proposal completed by April 1, 2006. Shortly thereafter, the search process for its director will be initiated.
The following will be key partners with CCLI:
- *All Faculties and academic units,*
- *Undergraduate and graduate students,*
- *University Teaching Services (UTS),*
- *AICT E-Learning,*
- *Learning Services (including the University Libraries, the Bookstore and Museums),*
- *Student Services*

Instituting an Adaptive Planning Process

Recommendation 15 (Pages 54)
The University will establish a Teaching, Learning, and Technology Council. This body will meet regularly to consider issues that influence learning environments, the viability of emerging educational technologies, and priorities for funding and support. This council will advise the Vice-Provost (Information Technology), the Director of CCLI, and other constituents as they develop e-learning policies and plan support strategies. The membership of the Council would include faculty members from each Faculty, online program administrators, faculty-based e-learning support staff, students, and representatives from relevant campus service organizations (e.g. AICT, Libraries, Bookstore, Student Services, and UTS).

Celebrating Our Successes

Recommendation 16 (Page 54-55)
This recommendation has three related parts:
1. *University-wide criteria for evaluating blended learning environments will be established by developing a set of standard questions to be incorporated into the Universal Students' Ratings of Instruction when technology is used as part of teaching.*

2. *Faculties are encouraged to develop FEC guidelines for evaluating teaching that involves e-learning.*

3. *One or more new awards in the area of innovation in teaching and learning using information technology should be created. The University-wide evaluation criteria developed as part of this recommendation should be used as a basis for selecting award-winners.*

Examining Intellectual Property

Recommendation 17 (Page 55)
In close collaboration with the Academic Staff Association, Non-Academic Staff Association, and the students' unions, the University should develop a policy on the intellectual property rights associated with online course materials.

In the immediate future the recommendations and strategies of the *E-Learning Report* will generate a constructive, responsive environment where University instructors will receive the support they need to use e-learning. Also, students will participate in learning environments that prepare them not only for success as lifelong learners, but also to become leaders in society. The *E-Learning Report* provides the foundation for a process of continual review and improvement of our learning environment by the full engagement

of the University community in an ongoing effort to examine the issues, explore the emerging technologies, and determine the priorities.

Figure 1 on the following page illustrates the manner in which the above recommendations create a integrated system of support to enhance of learning and teaching.
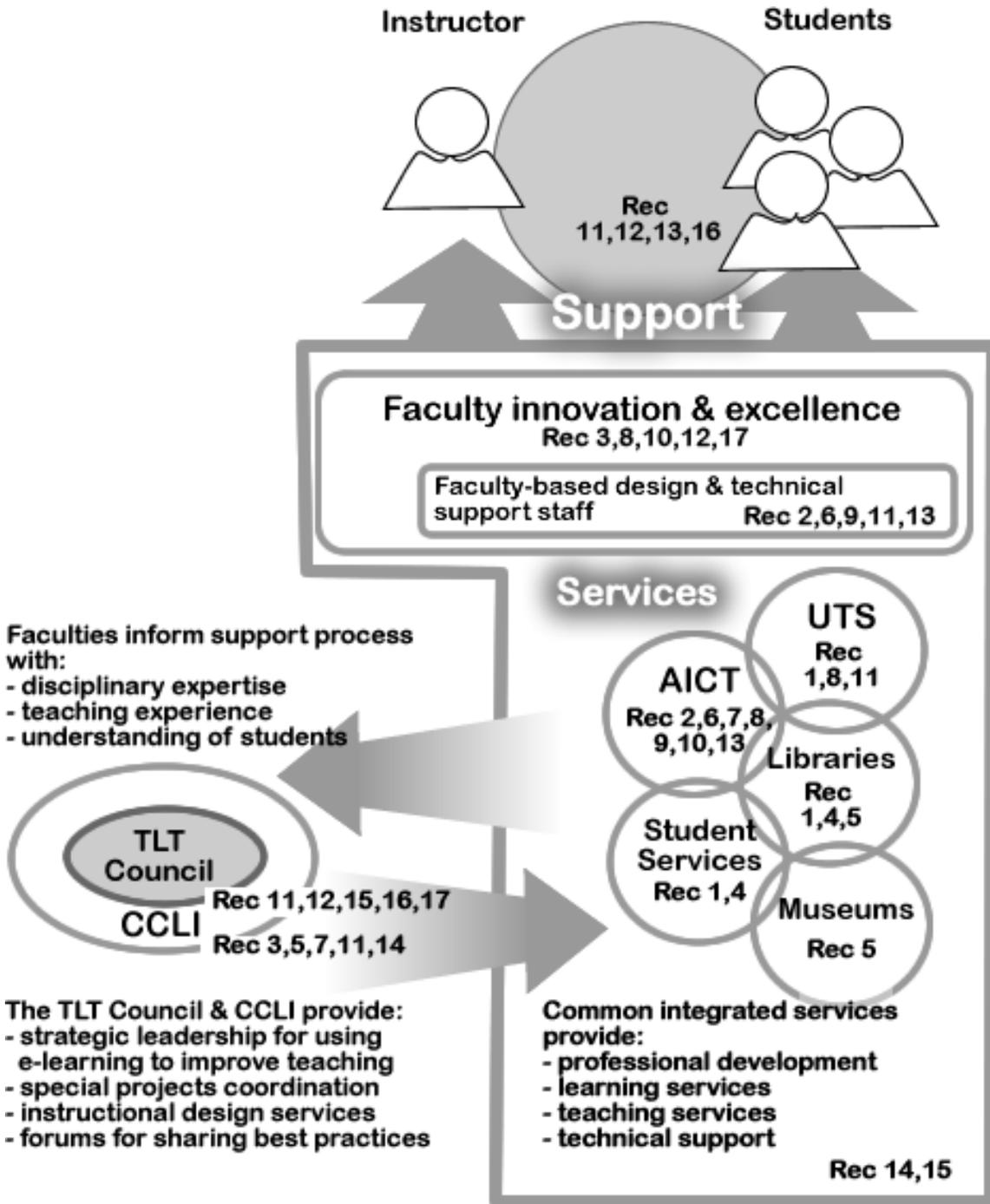
AICT – Academic Information & Communications Technologies
CCLI – Centre for Creative Learning Initiatives
TLT Council – Teaching Learning & Technology Council
UTS – University Teaching Services

Figure 1. Support for Teaching and Learning

Glossary

This report uses a number of terms drawn from theoretical and research literature related to educational psychology and e-learning. The following definitions are provided to orient readers who are unfamiliar with these fields.

Active learning	Active learning is facilitated by instructors. It is a dynamic process through which students go beyond listening and reading by also discussing course content, reflecting on its meaning through written work, and applying what they have learned to other contexts. Active learning has been found useful in developing a profound and long-lasting understanding of course content. Teaching methods used to promote active learning may or may not involve e-learning. Activities to facilitate active learning are often used in combination with didactic teaching methods.
Blended learning	Blended learning refers to situations in which instruction is provided using a combination of teaching methods that include face-to-face instruction as well as technology-enabled activities and digital resources. This also is sometimes referred to as flexible learning as it accommodates students who seek to reduce restrictions on the time and place of learning.
Chat	Chat is a commonly used term for instant messaging applications, which are computer programs that enable sending typed messages among two or more users.
Communities of practice	Communities of practice include both formal and informal organizations in which members collaborate to discuss issues, develop solutions, and build innovations.
E-learning	E-learning (electronic learning) involves the use of information and communications technologies to support learning. It may include the Internet, databases, videoconferencing, and wireless computing devices.
Learning content management system (LCMS)	An LCMS is software designed to provide a range of administrative and pedagogic services. For example, an instructor may use an LCMS to place course materials on line, post student grades, and hold online discussions, among other things. The most commonly used LCMSs worldwide are WebCT and Blackboard.
Learning object repository	Learning object repositories are online databases that are structured to facilitate instructors and learners finding and using

learning objects.

Learning objects	Learning objects are digital resources that can be reused to support learning.
Theory-based teaching (also referred to as evidence-based teaching)	Theory-based teaching is a term used to identify instructional practices that have been demonstrated by research to be effective for facilitating learning.
Weblogs (also referred to as Blogs or Web logs)	A Weblog is a Web-based discussion forum consisting of articles and other media submitted by participants.
Wiki	Wiki is a Web application that allows visitors to add and edit content on existing Web pages.

Introduction

The University of Alberta has emphasized teaching and learning throughout its almost 100-year history and is proud that it leads the country with a total of 24 professors who have received national 3M Teaching Fellowships. The success we have enjoyed can be attributed to the excellent leadership of these award-winners in addition to many other faculty who are dedicated to providing our students with an excellent learning experience. Campus and faculty-based support staff also have been essential to the creation of learning environments that are among the best in Canada. Our UTS (University Teaching Services) has been a key player in this success by fostering the sharing of best teaching practices and an outstanding mentorship program for most of the past 25 years. More recently, ATL (Academic Technologies for Learning) and Academic Information and Communications Technologies (AICT), formerly named Computer and Network Services, have provided leading-edge support in instructional design and the use of information technology in teaching and learning. More details of the roles and successes of each of these support units can be found in Appendix A.

The University has accomplished much, and has much to be proud of with respect to its leadership position nationally in teaching and learning. We cannot, however, rest on these laurels, and few will question that the challenges of providing a quality university education have never been greater due to tight budgets and ever-increasing demands on our faculty and students. The effective use of information technology in support of teaching and learning is critical to helping our instructors and students meet these challenges. This report develops a set of recommendations and a plan for e-learning that is consistent with the University's vision of being indisputably recognized as one of Canada's finest universities—and among a handful of the best in the world—in teaching, research, and community service.

Like all postsecondary institutions, the University of Alberta is encountering the effects of, and opportunities presented by, the use of information technology in support of teaching and learning. In the past many faculty members have been suspicious of agendas that promoted the use of learning technology either to reduce the costs of instruction, to allow the University to teach more students with fewer instructors, or to adopt it because "it's cool" and makes the University look *leading edge*. These agendas have been met, perhaps with justification, with skepticism by both students and faculty. However, a new agenda in which students *learn by doing* in the context of a blended-learning environment is quickly emerging: the University must plan for this transformation on a campus-wide scale, and we must do it more rapidly than most faculty and administrators imagine.

The use of information technology in teaching and learning has been much studied and reported. A University Senate task force released the *Technology in Learning* report in 1995. This document informed the University community that it was facing a revolution in education as a result of the opportunities inherent in educational technologies. *Technology in Learning* included a number of far-reaching recommendations, foremost among which was that the University implement a learner-centred instructional model

that would integrate multimedia and technology-based education methods. The task force stated that research in the implementation of traditional and emerging technologies was a crucial part of the University's commitment to lifelong learning.

Stressing that technology goals should be based on organizational goals, the report urged the University to align its educational technology activities with its vision, goals, and performance measures. Also, administration should formally indicate its commitment to the development of exemplary student-centred learning environments that effectively integrate technology. The task force proposed evaluating and restructuring the activities of existing educational technology support units to "improve cohesiveness, reduce duplication, and improve service*"* (p. 4).

The following year, 1996, a second report was issued titled *Learning First: An Agenda for Technology Integration at the University of Alberta.* This report continued the exploration and analysis initiated by *Technology in Learning.* It contained a comprehensive review of the various contributors to the quality of technology-enhanced learning environments. Today's readers will be familiar with many of the following challenges identified in the report:
- planning for the flexible use of teaching spaces;
- scaling technology support to meet increasing demands cost-effectively;
- procuring digital resources to support learning;
- rewarding teaching innovation;
- upgrading and maintaining costly information technology systems;
- ensuring a quality learning experience for students at a distance when most students in the University are on campus.

A quick examination of this list led many members of our E-Learning Plan Development Committee to conclude that most of these challenges still exist today. So what has changed, and why have we not made more progress?

It is important to examine the forces that affect change in order to understand why the situation is different today. Figure 2 summarizes these forces.
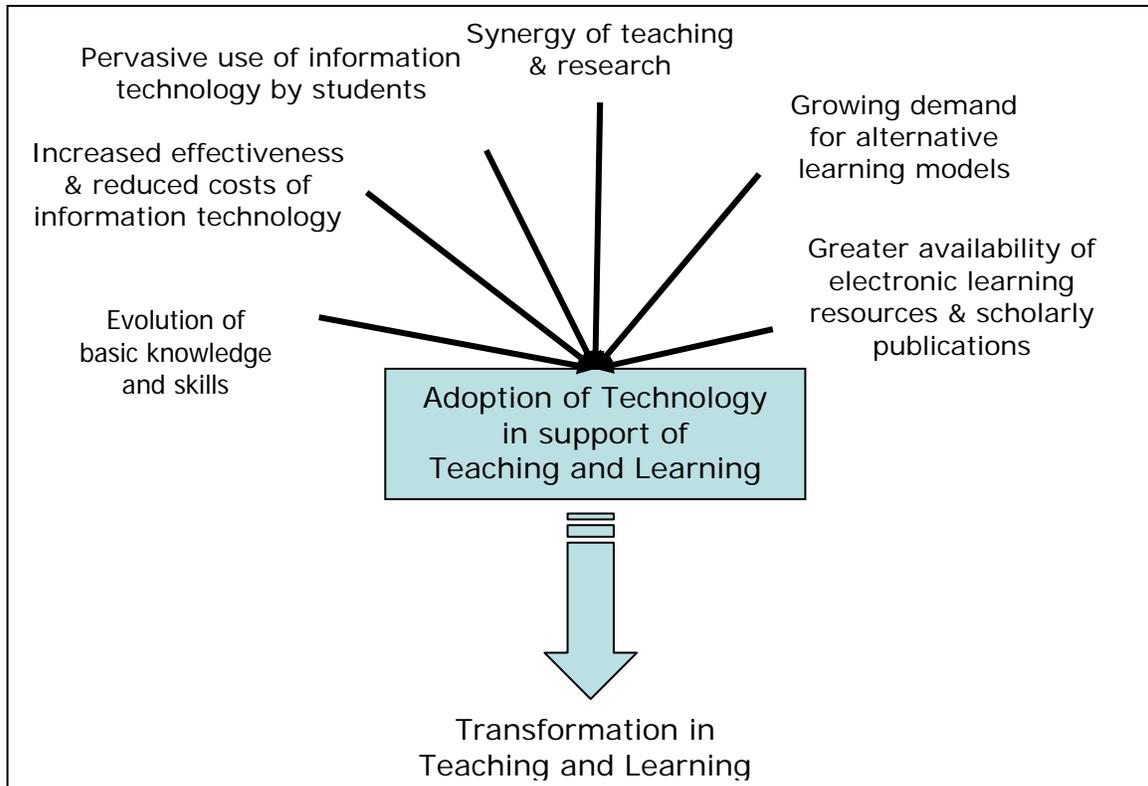
Figure 2. Forces leading to transformation in teaching and learning.

The basic knowledge and skills required to be competent professionals is evolving rapidly. Disciplinary knowledge is expanding to encompass technology-enabled processes and methods. New types of writing and research skills are required as technology becomes ubiquitous in our society. Also, globalization increases the necessity for our students to develop a direct understanding of how to communicate on a global basis in order to better understand other cultures and perspectives.

Certainly information technology has increased in effectiveness and decreased in cost during the past decade. Only a few years ago learning management systems were relatively primitive, and the World Wide Web was limited in terms of the scope and quality of available content. Shareable learning objects that provide advanced simulations or game-playing features did not exist. Online interactive technology such as Wikis were only imagined. Today the cost of a good student-entry laptop computer is in the range of $1,000. In 1995 a computer with similar capabilities would have cost in excess of $60,000, and it would not have been portable.

These reduced costs, coupled with significantly greater use of personal computers at home and in schools, has resulted in students who are much more attuned to using information technology. They have the predisposition and many of the necessary skills to take advantage of the greater availability of electronic learning resources and scholarly publications.

This greater availability of electronic learning resources and scholarly publications is changing how today's students research information. Many use the Web and the Google search engine to connect to their information sources and often prefer to access the library online rather than going to the bookshelves. The Government of Alberta has committed $30M over the next three years to expand the universe of licensed electronic information products available to postsecondary students through the Lois Hole Campus Alberta Digital Library. At the same time, the Social Sciences and Humanities Research Council (SSHRC) is working actively through the Synergies initiative on policies to institute open-access publishing for its federally funded research to broaden access online to Canada's scholarly output.[1]

The University of Alberta is often described as a research-intensive institution. During the past decade it has on a per-faculty-member basis outperformed all other Canadian institutions in terms of research funding received. Research revenues are now almost $400 million per year and represent 40% of the University's $1 billion budget. In 1996 research funding totalled $125M, which represented 22.9% of its $547M budget. The importance of research to teaching and learning was recognized by Gary Kachanoski, Vice-President (Research) in 2003 when he commissioned a report titled *Integrating Research and Teaching at the University of Alberta: Creating a Foundation for an Inquiry-Based Life* (Working Group on Teaching and Research, 2004). Our outstanding research programs differentiate the University of Alberta from many other educational institutions.

The onus is on us to realize the full advantage of this capability. The first recommendation of the Integrating Research and Teaching Report Working Group (2005) report states that the University must "ccontinue to develop as a learner-centred institution and continue to develop ways to integrate research into the learning environment to enhance the undergraduate experience." We must promote the synergy of teaching and research and not see these core activities as being in competition with each other. E-learning technologies and digital resources will play a vital role in enabling this synergy to evolve.

Finally, the force that is now much more in evidence than it was a decade ago is the increasing demand by students for alternative methods for learning. As noted in the article *Disruption in Education* (Christensen, Aaron, & Clark, 2003) in the United States,

> Enrollment in four-year programs has grown at a snail-like rate of one half percent per year over the past decade.… Meanwhile, distance learning is growing and corporate universities are growing at meteoric rates. Enrollment in distance learning is growing at three times the pace of classroom-based programs and is expected to reach five million by 2005. Corporate training is a $32 billion annual industry, with a reported 2,000 corporate universities in the United States. (p. 45)

---

[1] Information about the Synergies initiative is located at:
http://www.carl-abrc.ca/projects/sshrc/pdf/transformation-brief-e.pdf , and
http://www.bcamp.bc.ca/pdf/online.pdf

The key factor creating the disruption in education is the adoption of information technology in support of learning anywhere and at any time. Fully online programs are sought by professionals who are unable or uninterested in attending programs that require their regular physical presence.

E-learning is not only for students at a distance. Today's undergraduates are familiar with and value of wireless connectivity whether it is for their cell phones, PDAs, or laptops. In 2004 the EDUCAUSE Centre for Applied Research (Caruso, 2004) conducted a study of 13 institutions of higher education and found that 72% of the respondents preferred moderate to extensive use of technology in the classroom. Of those students who had participated in a course that used a learning-content management system (e.g., WebCT, Blackboard), 76% were either positive or very positive about the experience.

The growing demand for learning models that incorporate e-learning is summarized by Dede (2005) in his article on changing student learning styles.

> Overall, the Internet-based learning styles ascribed to "Millennial" students—
> those born after 1982—increasingly apply for many people across a wide
> range of ages, driven by the tools and media they use every day. As computers
> and telecommunications continue to evolve, what new forms of Neomillennial
> learning styles might emerging media enable, and how can higher education
> prepare for this shift? (p. 8)

Dede's question is excellent, and our response to it is contained in the recommendations of this report.

The combination of the six factors that lead to the transformation of teaching and learning makes paramount the need for the University to reevaluate and update its strategy for e-learning. This report is not meant to stand as a conclusion or a finite collection of strategies. Rather it is intended to stimulate ongoing dialogue and change. The recommendations establish mechanisms to ensure that the University is both responsive to external forces and proactive in exploring the many opportunities afforded by information and communications technologies.

Purpose and Organization

This document is a first important step in a campus-wide strategy to plan for and implement a tranformation of how we provide education to our student body. The document responds to the *May 2004 External Review of the University of Alberta E-Learning Support Units*, which recommended the development of an E-Learning Plan along with a number of changes in how the University is organized to provide e-learning support. Perhaps more important, the process to carry out the development of this document was identified by participants as timely or overdue.

The document comprises six sections. Following this introduction, the second section traces the University's earlier efforts to build both expertise and technological capability

in e-learning. This summary is important in that it provides both a context for this planning activity and some lessons learned. An e-learning plan must be developed in conjunction with and certainly not apart from the overall academic plan for the University. The third section explores the strong relationship between this plan and the academic plan currently being developed. The planning committee believes that the recommendations from this plan must carry significant weight in the University's plan. Otherwise this plan will have missed its mark and this may jeopardize the future of our institution. The fourth section presents the important themes identified during the committee's deliberations. Associated with each theme is a set of recommendations that will be carried forward to both adminstrative and academic committees in the University (i.e., General Faculties Council [GFC]). The fifth section outlines the strategies, and where appropriate the cost, of implementing the strategies for the recommendations identified in the previous section. The final section briefly summarizes the document and draws some conclusions.

Process

This E-Learning Plan was developed under the auspices of the Vice-Provost (Information Technology).[2] The Terms of Reference for the committee are provided on page 2 of the report. Several activities were carried out or supported as part of the committee's work and plan development process. In chronological order these include:

1. Initiation Phase (February 3 and 10): initial meeting and acceptance of terms of reference, summary of initial questionnaire identifying issues and opportunities, plan development steps and schedule, and goal statements.

2. Analysis of where we are now in e-learning (February 18, March 3 and 17): this involved presentations from several units and faculties about current approaches, practices, and future needs. A description of the e-learning support available in each Faculty is summarized in Appendix B.

3. Future Directions Workshop (March 10 and 11): the committee invited to campus to discuss directions of e-learning Steve Ehrmann, Vice-President TLT Group and Director of the Flashlight Program at Takoma Park, Maryland, and Carolyn Jarmon, Senior Associate, National Center for Academic Transformation. They participated in a workshop open to the campus community on March 10 and met with the E-Learning Plan Development Committee on March 11 for a question-and-answer session.

4. Further roundtable discussions (March 24, 31, and April 7): committee meetings.

---

[2] The Vice-Provost (Information Technology) reports to both the Provost & Vice-President (Academic) and the Vice-President (Finance & Administration). AICT (Academic Information and Communications Technologies), AIS (Administrative Information Systems) and UTS (University Teaching Services) report to the Vice-Provost (Information Technology). This position was created in July 2004 to lead the development, evolution and implementation of a long-range information and communications technology (ICT) plan for the University.

5. Discussion of final report organization and surveys[3] (April 7, 14, and 28): committee meetings.

6. Discussion of report recommendations (April 28, May 6 and 18): review of the major recommendations of the report.

7. Preliminary feedback on the report was obtained from the Academic Advisory Group (May 24) and the Committee on Learning Environments (June 1).

In addition to these discussions, it was recommended that the committee members read a number of articles. Links to these articles and to the minutes of all committee meetings and other consultations that took place during the development of the E-Learning Plan can be found at www.vpit.ualberta.ca/elearning_plan.

The completed plan has been presented for feedback and input at several venues before it is submitted for approval by GFC. Review committees include the Academic Advisory Group (AAG), IT Committee, Committee on Learning Environments (CLE), Executive Planning Committee (EPC), Deans' Council, and President's Advisory Committee of Chairs (PACC).

This E-Learning Plan is only part of an ongoing dialogue in which we examine issues, explore emerging technologies, discuss priorities, and seek ways continually to improve our teaching and learning environments. The overarching purpose of the recommendations and strategies in this report is to establish a sustainable network of people and processes collaborating toward the effective and efficient use of e-learning in the University.

---

[3] The E-Learning Committee initiated a questionnaire concerning Faculty support of e-learning that was sent to all deans. The Committee also considered several other surveys undertaken by the Faculty of Arts, the Faculty of Science, the Faculty of Extension, and the Students Union. Pertinent findings of these surveys are available online at: http://www.vpit.ualberta.ca/elearning_plan/.

E-Learning in Higher Education

A renewed interest in the practice and research of teaching and learning has been promoted through work on the scholarship of teaching, a term first used by Boyer (1990) in his well-known work *Scholarship Reconsidered*. Boyer wished to highlight that faculty needed to emphasize teaching as a scholarly activity. He wanted faculty to reflect more on their teaching and essentially to apply scholarly inquiry to this aspect of their work. He proposed that faculty should move away from thinking about teaching as an individualistic, idiosyncratic, private, ephemeral activity to thinking about it as open to systematic reflection and essentially collaborative. In active learning everyone in the classroom is both teacher and learner, so activities that involve students as researchers are part of this orientation. Like other scholarly activities, the scholarship of teaching should be the focus of systematic inquiry, and its results made public through peer-reviewed journals. Disciplinary styles influence the design of teaching (Huber, 1999), and many disciplines have signature pedagogies (Schulman, 2005). Boyer's work has been the foundation for the Carnegie Academy for the Scholarship of Teaching and Learning (CASTL), a multi-year project funded by the Carnegie Foundation and the Pew Charitable Trusts.

Universities are increasingly emphasizing teaching and learning in response to the effect of globalization, the ubiquity of digital technologies, and the changing needs of society. Graduates today require more than information: they need to have communication and problem-solving skills, to be critical users of information, to see from diverse perspectives, to reason ethically, to work effectively in teams, to be able to create new knowledge, and to be lifelong learners. Concurrently, studies on the cognitive aspects of learning support a more active learning environment that will encourage deeper levels of understanding (Bransford, Brown, Cocking, Donovan, Pelligrino & NRC (1999; 1999a); Slavin, 1990). The move to a learner-centred environment presents several challenges for faculty, and they will need sustained support throughout this process.

One of the best known initiatives designed to enhance teaching and learning in higher education is Chickering and Gamson's (1987) *Seven Principles for Good Practice in Undergraduate Education*. The principles are based on an analysis of decades of research on learning in higher education. As Gamson notes, the seven statements are based on a view of education as active, cooperative, and demanding and arose from the efforts of a group of knowledgeable research scholars to provide a list that would be "accessible, understandable, practical and widely applicable" (p. 3). The following seven principles are well regarded in higher education and widely disseminated.

Good practice in undergraduate education…
1. encourages contact between students and faculty,
2. develops reciprocity and cooperation among students,
3. encourages active learning,
4. gives prompt feedback,
5. emphasizes time on task,
6. communicates high expectations, and

       7.   respects diverse talents and ways of learning.

In 1996, in conversation with Ehrmann, Chickering discussed the implications of the seven principles for working with new technologies (Chickering & Ehrmann, 1996). Evaluation of the points was the aim of the Annenberg/CPB *Flashlight Project*. The suite of evaluation tools developed as a result are now part of the services offered by the Teaching, Learning and Technology (TLT) Group. For a description of this centre refer to Appendix E.

The integration of educational technologies in teaching and learning has for some time been of interest to postsecondary institutions. From an Organization of Economic Co-Operation and Development (CERI, 2005) survey of online learning (another commonly used term for e-learning) in 122 Commonwealth universities in 12 countries, Garrett and Verbik (2004) concluded that "an institution-wide strategy for on-line learning was increasingly common" (p. 5). They also identified a growing emphasis on the integration of technologies into all aspects of the institution. Canadian institutions displayed a less-developed, institution-wide strategy for online learning than institutions from Asia-Pacific, the United Kingdom, or Australia. At least 80% of all respondents thought that online learning would "greatly enhance on-campus learning at my institution in the next five years" (p. 6), and the authors noted, "As in 2002, on-campus enhancement continued to be the dominant focus of almost all university online learning strategies, followed by a correlative desire to improve flexibility of delivery for students" (p. 7).

The term *e-learning* has been used to describe many teaching practices that incorporate technology. The OECD (2005) refers to e-learning as "the use of information and communications technologies to enhance and support learning." These technologies may include, but are not limited to, the Internet, videoconferencing, e-mail, adaptive hypermedia, specialist disciplinary software, learning management systems, and simulations. Information and communications technologies may be incorporated as part of instruction in many ways. E-learning encompasses each of the following three categories of practice.

Traditional courses supplemented by technology. In this category of e-learning, information and communications technologies are implemented for administrative reasons and/or to enrich the course. For example, course notes, syllabi, and grades may be placed on the Web. The instructor may use e-mail and online discussion groups and provide online links to external resources. However, there is little or no reduction of face-to-face class time.

Blended learning. In this instance the instructor uses information and communications technologies to replace part of face-to-face in-class instruction. For example, students may be required to participate in technology-enabled activities such as online discussions or project collaborations as part of their course work. They might participate in simulations or participate in virtual classes using videoconferencing. Blended learning may be used for several reasons that include one or more of the following: enriching and elaborating upon lectures, shifting presentation functions to the online environment so

that class time may be used for other purposes, using the same set of classrooms to support a greater number of courses, and increasing access to courses for students unable to attend all lectures.

Fully online. At this end of the e-learning continuum, learning resources and activities are situated on the Web. Supplementary resources such as texts and print packages may be used, but most if not all instruction and communication with the instructor and among the students takes place online (Pirani, 2005).

E-learning provides greater flexibility in terms of where and when students can participate in learning activities. As a result, those who discuss the advantages of using e-learning often emphasize how it reduces barriers to accessing educational programs. However, from a pedagogical point of view, the focus of e-learning is not access, but learning. It provides learners with the opportunity to be more autonomous and to take greater responsibility for their own learning; it provides opportunities for more sustained interaction; and it gives faculty a wider variety of alternative learning environments in which to encourage greater participation and collaboration.

In Canada an Advisory Committee on Online Learning (2001) established by the Council of Ministers of Education Canada and Industry Canada encouraged the development of a concerted approach, noting that Canada is well positioned to be a world leader in e-learning. However, although there is general consensus on the ubiquity of digital communications and the changing expectations of students, the complexity of learning situations means that few studies using traditional research design parameters have addressed the effectiveness issue. Hiltz and Goldman (2005); Bernard, R. M., Abrami, P.C., Lou, Y., Borokhovski, E., Wade, A., Wozney, L., Wallet, P.A., Fiset, M., and Huang, B. (2004); and Burns and Ungerleider (2003) are among those who have attempted meta-analyses of the data. In each case results indicate that in general there is a positive correlation, but they also recognize that the effect of the teacher's instructional strategies, the types of technology used, and the specific learning situation are crucial intervening variables. In addition, because the advantage of educational technologies is that they can help transform possibilities in teaching and learning, measuring them against comparative classes where technology is not used risks ignoring the objectives for which the technologies were initially chosen.

In practical terms, the above research reiterates decades of findings that indicate that solely using educational technology does not necessarily improve learning. E-learning is a facility or tool and does not represent any particular instructional method. The outcomes resulting from e-learning are a direct result of what faculty and students do with this facility. The instructional methods used in conjunction with technology are what are critical to learning outcomes. In other words, for e-learning to be effective it must be coupled with teaching practices that have been demonstrated as beneficial. It also must be employed in ways that are appropriate to the nature of content as well as to the needs and abilities of the learners.

The University of Alberta and E-Learning

Strategic Direction of the University

The Strategic and Academic Plans of the University of Alberta establish the organizational context for the E-Learning Plan. The following vision and mission statements help define the direction and purpose of the University and of e-learning on our campus.

Vision

The University of Alberta, in teaching, research and community service, will be indisputably recognized, nationally and internationally, as one of Canada's finest universities, and amongst a handful of the world's best.

Mission

The mission of the University of Alberta is to serve our community by the discovery, dissemination and application of new knowledge through teaching and research.

Goals

The goals delineate the social outcomes implicit in the University actualizing its vision and mission.

- The University will prepare students for successful lives and careers as leaders of tomorrow.
- The University will be a leader in the creation, dissemination and application of knowledge.
- The University will achieve institutional excellence.
- The University will contribute to the needs of its communities.

The above vision, mission, and goal statements are taken from *Quality Investment in Alberta's Future–2004 Update to 2002-06 Strategic Business Plan.*

Academic Themes

It is anticipated that our new President, Indira Samarasekera, will initiate a community exploration and update of the University's vision, mission, goals, and key strategic initiatives. To prepare for this activity, the Vice-President (Academic) and Vice-President (Research) facilitated an inclusive consultation process with deans, department chairs, students, staff, faculty members, and university committees. One goal of this process was to examine and reaffirm the University's academic culture. As well, participants sought to identify unifying themes in teaching and research that would promote institutional vitality.

Academic themes resulting from the public consultation process are described as "particularly appropriate for immediate significant activity because they build upon existing strengths and activities or have immediate opportunities for development and they address critical needs."

Although establishing a vision for the University as a whole is essential, it is also recognized that many robust strategies emerge from Faculties that have their own contextually relevant visions and priorities for the future. Because of this, the academic themes developed through the public consultation process are guidelines rather than a firm set of priorities. Some themes are generally applicable, such as the theme about the quality of the undergraduate experience, whereas others may be more relevant to some Faculties than others. Also, each Faculty will develop themes unique to its specific context.

The academic themes that have been identified are:
- Improve the quality of undergraduate experience;
- Focus on the teaching-research continuum;
- Northern strategy;
- Aboriginal engagement;
- Rural engagement;
- Interdisciplinary collaboration;
- International engagement.

<div align="right">(Draft themes for joint meeting of
Deans and Chairs, 2005)</div>

Academic Themes and E-learning

Information and communications technologies are praised for their capacity to span distance, connect communities, and rapidly transmit huge volumes of data. E-learning is one integrated application of these technologies. As such, e-learning has the potential to affect how all the themes are realized. However, two themes have the most immediate relationship to e-learning strategy: improving the undergraduate experience and focusing on the teaching and research continuum.

The academic themes derived from the consultation process confirm that the quality of undergraduate experience is central to fulfilling the University's vision and mission. Several committees and university service groups have initiated activities to improve the undergraduate learning experience. This academic theme underlines the fundamental importance of this work and establishes a framework for future efforts. Its description includes a number of methods for improving undergraduate learning environments.

Recommended practices range from upper-level Faculty program planning to individual instructional strategies to be used in courses. Faculties are encouraged to consider curriculum renewal and strategies to involve students in scholarly research programs. A number of methods for transforming teaching are proposed including active learning, problem-based instruction, using cohorts to establish learning communities, and providing small-class opportunities.

The thoughtful application of educational technologies will enable the university to implement cost-effectively many of the methods recommended as part of improving the

undergraduate experience. Well-designed e-learning environments allow instructors to establish active learning activities and use problem-based instruction despite large class sizes. Communications technologies not only increase access to information, but may also be used to facilitate collaboration and discourse among students, instructors, and external experts. E-learning provides a means for increasing the flexibility of learning environments to accommodate students with diverse knowledge, skills, and cultural backgrounds. The profound shift in how people approach learning and teaching accelerated by e-learning is now influencing the architectural design of teaching facilities.

The academic theme that focuses on the teaching-research continuum is also of immediate and direct relevance to planning e-learning. The discussion of this academic theme encourages integrating teaching with research by establishing extensive lab and field research opportunities for undergraduate students. Work placement and community service are regarded as potentially viable means for blending learning with research. The goal is to create a continuum of scholarship through to the postdoctoral level.

E-learning may be used to cultivate the integration of teaching with research through involving students in learning about research, developing research skills, and performing research in virtual environments. Information and communications technologies enable students not only to access data, but to speak with other researchers as part of participating in research communities.

High speed internet connections are in place in Asia, Latin America, Europe and parts of Africa and provide vehicles for multi-partner research networks and seminars. The use of blended models that incorporate a variety of instructional methods and technologies, including videoconferencing, web-conferencing, and online discussion boards offer cost effective ways of linking University students and faculty members with the broader international community. These innovative blended programs provide additional possibilities for co-teaching courses and programs with other international universities, sharing existing resources, and developing learning communities to exchange and generate knowledge.

Over time the University's e-learning strategies will be integral to pursuing the themes involved in the northern strategy and engagement with Aboriginal and rural communities. Similarly, the theme on interdisplinary collaboration will be achieved in part through the systems established to support e-learning.

Key University Documents Examining E-Learning Strategies

As described in the Introduction, the University released *Technology in Learning,* a University Senate task force report in 1995 and *Learning First*, a follow-up report in 1996.

Because of its planning focus, *Learning First* serves as a benchmark against which the University might measure its progress. Since 1996 massive investments have been made in expanding labs, improving the information technology infrastructure, establishing computer standards, and shifting toward a learner-centred educational climate. When the

report was written, a learning management system was not yet in place. *Learning First* also catalogues the many groundbreaking Learning Enhancement Envelope (LEE) projects that were underway at the time. The improvements in technology infrastructure, the understanding generated by the LEE projects, and the professional development programs for university instructors provide the firm foundation that underlies the broad scope and depth of technology integration in our University in 2005.

Learning First also proposed an integrated Learning Centre that would incorporate:
- physical spaces for videoconferencing, distance education, and multimedia presentations;
- a production studio for multimedia content development;
- a business centre;
- an advanced communications network interfacing with the outside world;
- a central switching and control centre for technology-enabled classrooms.

The Learning Centre described in this report served as the conceptual framework for the TELUS Centre for Professional Development.

The *Technology in Learning* and *Learning First* reports stress the importance of aligning the efforts of service units and faculties to foster superior learning environments for students. The reports also record the many obstacles to achieving this ideal state in the University of Alberta.

Since 1996 the University has benefited from the efforts of dedicated academic and support staff associated with such units as University Teaching Services (UTS), Academic Technologies for Learning (ATL), and e-learning services through Computer and Network Services (now Academic Information and Communications Technologies or AICT). The programs and services of these units expanded to reflect the significant increase in the use of technology in teaching. For descriptions of the activities of these units, see Appendix A. The necessity for the strategic alignment and coordination of their activities as identified in *Technology in Learning* became increasingly urgent.

In late 2003 the Office of the Provost and Vice-President (Academic) initiated a review of e-learning support units in the University. External reviewers were contracted to:
- assess the mandate and organization of e-learning support units;
- identify the strengths and opportunities for improving services and support for e-learning; and
- recommend guidelines for allocating resources for information and communications technologies and e-learning.

The reviewers interviewed a large number of administrators and faculty representatives as well as a number of the staff of the e-learning support units. M. Prescott and J. Curry, the reviewers, summarized their observations and recommendations in the *External Review of the University of Alberta E-Learning Support Units* issued in May 2004.

The reviewers heard that faculty members implementing technology in their teaching repeatedly found that the increased workload inherent in this activity was neither recognized nor rewarded. A number of those interviewed reported that they were confused as to the various roles of the service units, especially given the increasing overlap in services between ATL and AICT E-Learning. The reviewers also noted the pressures inherent in managing the increased volume of WebCT use on campus and commented that this growth would be unsustainable without additional resources. They emphasized that the anticipated increased use of educational technology would continue to escalate the demands for support.

In their recommendations the reviewers encouraged the Provost and Vice-President (Academic) to take "immediate and decisive action to position the University of Alberta to better support the use of ICT to support learning and teaching." The three overarching recommendations of the report were:

- to establish strategic directions and plans;
- to create a new umbrella unit for e-learning support; and
- to focus on areas of opportunity that included launching targeted initiatives for achieving greater impact, developing WebCT scaling strategies, and assessing the priority of entirely distance programs that provide greater access to students.

The *External Review of the University of Alberta E-Learning Support Units* concluded:

With the common goal of supporting more effective learning and teaching through the use of technology, the expertise of the staff of support units, a body of innovative faculty interested in sharing their experiences, and a supportive administration, the vision of the future is a compelling one.

Support for E-Learning Provided in Faculties

Each faculty determines its strategy for supporting e-learning. Some rely more on central services than others. For comparison, Faculty strategies for providing e-learning support to instructors are organized into the following loosely defined categories:

- basic technical support;
- enhanced technical support;
- e-learning consulting and technical support;
- integrated service centre.

These strategies are described below.

Types of Support Strategies

Basic technical support

Core services

- *Computer systems and desktop support.*

With this strategy for e-learning support, instructors receive local support from staff hired by the Faculty or department for desktop applications and networking with University and Faculty computer systems. Most if not all services specifically related to educational technology and teaching are received from central campus service units such as AICT, Technology Training Centre, Creative Services, and UTS.

Enhanced technical support

Basic systems and desktop support continue to be part of the core services in this strategy. However, these services are extended to include one or more of the additional technical services to augment significantly the support provided to instructors using e-learning.

Core services

- computer systems and desktop support.

Supplementary technical services include one or more of the following:

- media production support;
- local WebCT support (or support for alternative learning management system);
- specialized e-learning applications licenses and support;
- maintenance of a local learning object repository;
- local professional development services related to technical topics.

For example, instructors who receive enhanced technical support may have access to local support for WebCT or specialized e-learning applications such as Elluminate, which enables synchronous conferencing. Production support for media may be available to instructors. In some instances these services are provided by students. Faculties or departments may elect to support learning-object repositories. The Department of

Biological Sciences' Bio-DiTRL is an outstanding example of a learning-objects repository developed and maintained by a Department.

The combination of e-learning services in this strategy might include professional development workshops that are primarily technical in focus. Instructors in Faculties implementing the enhanced technical support strategy may not rely as much on central services for technical support, but do depend on the availability of central support for instructional design and professional development activities about teaching methods.

E-learning consultants and technical support staff

Distance education programs and the escalating use of e-learning for students on campus have resulted in a number of Faculties hiring e-learning consultants who specialize in adult learning and educational technology. Although the e-learning consultant and technical support staff typically collaborate extensively, they do not work in the same unit as is the case with full-service centres.

Core services are provided by design consultants and technical support staff working largely independently:
- computer systems and desktop support;
- instructional design consulting;
- professional development sessions related to both technical and educational topics.

Supplementary services may include one or more of the following:
- media production support;
- local WebCT support;
- specialized e-learning application licenses and support;
- maintenance of a local learning-object repository.

The e-learning consultant may be responsible for some media production and technical support for e-learning technologies. Nursing is an example of a Faculty with a strategy that involves an e-learning consultant working in collaboration with technical support staff. The production support and professional development activities provided as part of this strategy are often determined by the availability and skills of the e-learning consultant. Faculties have found that local e-learning consultants who know about discipline-specific teaching practices develop strong positive relationships with faculty.

Integrated service centres

This strategy integrates technical and instructional design services in a single operational unit.

Staff providing core e-learning services are integrated into one unit:
- computer systems and desktop support;
- instructional design consulting;
- professional development sessions on technical and educational topics.

Supplementary services include one or more of the following:

- media production support;
- local WebCT support;
- specialized e-learning application licenses and support;
- maintenance of a local learning-object repository;
- projects room for faculty and/or students.

Integrated service centres achieve synergies through close working relationships among individuals with instructional design and technical expertise. These centres typically offer a broader range of services and may provide a project room for faculty and students who are developing e-learning resources. An integrated centre is also well suited for preparing a plan to guide e-learning support in the Faculty. For example, the Faculty of Arts and the Faculty of Education have both implemented full-service centres. The Department of Chemistry also has an integrated service centre.

Table 1 summarizes the e-learning support available in Faculties in the University of Alberta. It provides a high-level view of the Faculty- and department-based technical and instructional design services available to instructors. Note that in some Faculties, departments may provide additional e-learning support to augment services provided by the Faculty. Also, some Faculties (e.g., Nursing, Extension) do not have departments.

Table 1 is a preliminary attempt to benchmark e-learning support available within faculties. For future reports, other aspects e-learning implementation should be researched and reported including:

- teaching methods used in conjunction with e-learning

- support strategies used within faculties (e.g. workshops, tutoring, special project initiatives, etc.)

- evaluation activities

- faculty-based support to promote good teaching practices whether or not technology is used

See Appendix B for more detailed descriptions of Faculty resources allocated to supporting e-learning. These descriptions demonstrate that:

- some Faculties are more engaged in e-learning than others

- support needs vary across the University

- the amount of instructional design and e-learning support available to instructors differs widely

Table 1. E-learning support located within Faculties — 2005

	Basic Technical	Enhanced Technical	E-Learning Consultant(s) & Technical	Integrated Service Centre
Agriculture, Forestry & Home Economics	F/D	F/D	D	D
Arts	F/D	F/D	F/D	F
Augustana	F	-	-	-
Business	F	F	-	-
Education	F	F	F	F
Engineering	F	? F	-	-
Extension	F	F	F	-
Faculté Saint-Jean	F	F	-	-
Law	F	F	-	-
Medicine & Dentistry	F/D	D	D	
Native Studies	F	-	-	-
Nursing	F	F	-	-
Pharmacy	F/D	D	D	-
Physical Education	F	-	-	-
Rehab. Medicine	F/D	D	-	-
Science	F	D	D	D
St. Joseph's	F	-	-	-

F (Faculty):   This level of support is available for all instructors within the Faculty.

D (Department):   One or more departments provide this level of service in addition to the Faculty-wide services denoted with an *F*.

Note. This information is derived from the deans' responses to the Resource Questionnaire and from Faculty descriptions submitted to the E-Learning Committee.

Results From the E-Learning Resource Questionnaire Results

To obtain an accurate understanding of Faculty resource allocations and priorities associated with e-learning, all deans were invited to respond to a questionnaire. This survey was conducted in April 2005 with 13 out of 14 Faculties responding.

Deans were asked to provide the number of full-time equivalent (FTE) support personnel who assisted with e-learning activities. The personnel were divided into two groups: technology support and instructional (and possibly curriculum) design support. Although the instructional design FTE numbers appeared to be relatively easily determined, some respondents reported difficulty in differentiating e-learning support and basic technical support as these services could be provided by the same people. Indeed the range in values for FTE technology support suggests that Faculties may have differed in how they calculated the FTE for technology support.

The FTE for instructional design was somewhat easier to calculate as these positions are relatively discrete. However, the FTE numbers may include staff that also provide consulting services on a contract basis as is the case with the Faculty of Extension.

Most Faculties reported needing to hire additional staff in the next three years for both technology and instructional design support.

Seven of 14 Faculties anticipated greater than 60% growth in e-learning activity over the next three years. This is significant given that some Faculties are already using e-learning extensively and reported that their estimated future growth estimates were lower as a result. Given the anticipated increase in e-learning activity, it is not surprising that 10 of 14 Faculties identified e-learning as either an *important priority* or a *very high priority.*

Responses to the questions about the adequacy of central support suggest room for improvement. Eleven of 14 Faculties indicated that both technical and instructional design support provided centrally has been inadequate.

The deans were asked to calculate the FTE support personnel dedicated to assisting faculty with e-learning. This support was differentiated into technical support and instructional design support. To facilitate comparing large and small Faculties, the FTE calculations were weighted using the following means.

- The number of academic staff[4] was divided by the FTE technical support to arrive at the faculty to FTE tech ratio.
  (see Figure 3 for a summary of these ratios).
- The number of academic staff in the Faculty was divided by the FTE instructional design to arrive at the faculty to FTE ID ratio (see Figure 4).
- The number of full- and part-time students[5] enrolled in the Faculty was divided by the FTE technical support staff to arrive at the students to FTE tech ratio (see Figure 5).
- The number of full- and part-time students enrolled in the Faculty was divided by the FTE instructional design to arrive at the students per FTE ID ratio (see Figure 6).

Table 2 shows the ratios from which the graphs have been derived.

Table 2: Faculty FTE Ratios

	students/ FTE tech	faculty/ FTE tech	students/ FTE ID	faculty/ FTE ID
AFHE	436	25	3484	200
Arts	2710	140	5420	280
Augustana	4000	27	0	0
Business	1153	36	2306	71
Education	4049	117	2025	59
Extension	812	3	1625	7
Law	268	16	536	31
Nursing	653	24	1306	47
Rehabilitation Medicine	561	31	0	0
Saint-Jean	585	24	0	0
Science	600	27	1029	47

Note: Several Faculties were unable to compile information about their internal e-learning support in time for this report (i.e. Engineering, Medicine and Dentistry, Pharmacy and Pharmaceutical Sciences, Physical Education). Other Faculties have little or no technical and design support for e-learning available internally (i.e. Native Studies, St. Joseph's College). These Faculties were excluded from the following graphs.

See Appendix G for the survey questions and responses.

---

[4] The number of academic staff was taken from the University of Alberta Data book 2004-2005. Academic staff includes full-time continuing the following positions: assistant, associate, and full professors, Faculty Service Officers, Academic Professional Officers, Librarians, and other continuing positions paid for from Operating Funds.
[5] The number of students was taken from the University of Alberta Databook 2004-2005 for the Fall 2004, with one exception. The Faculty of Extension number of students was based on total number of registrations tracked by this Faculty's registration system.
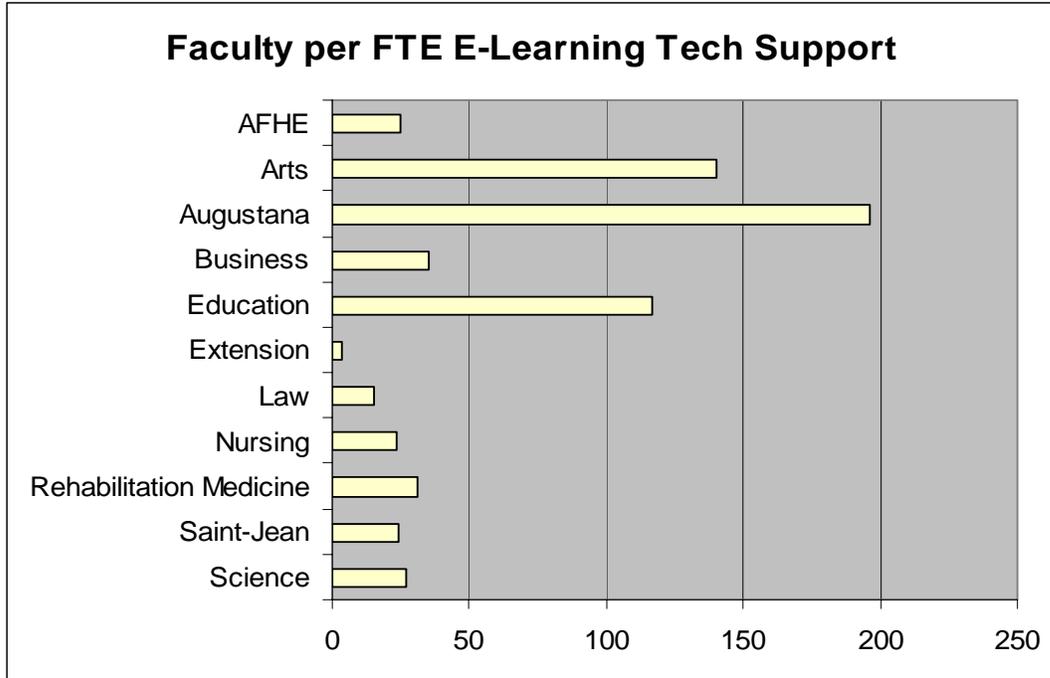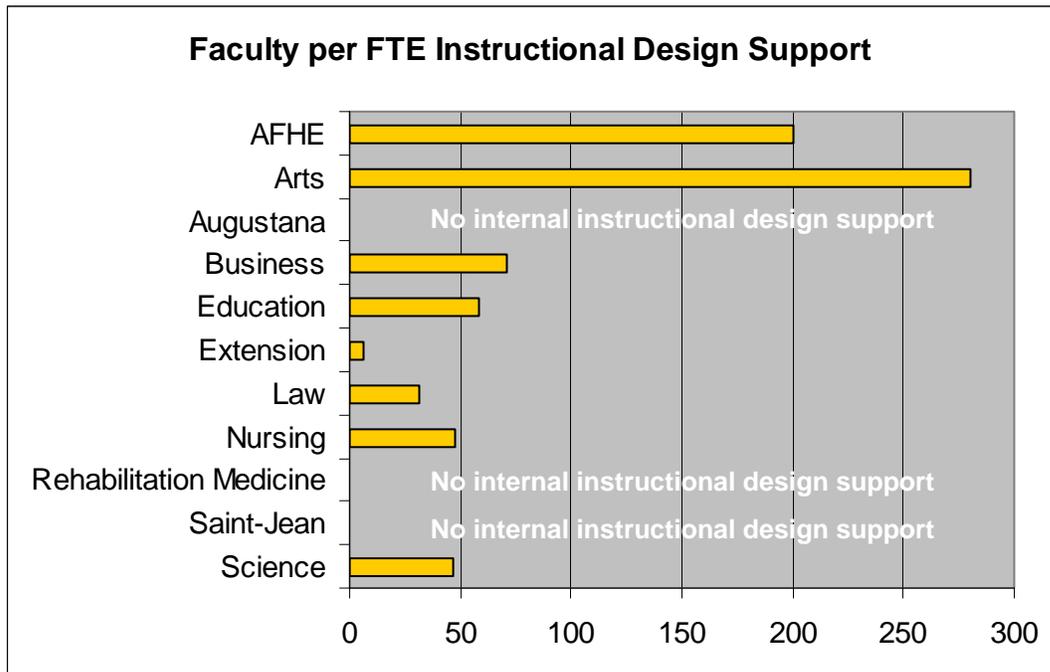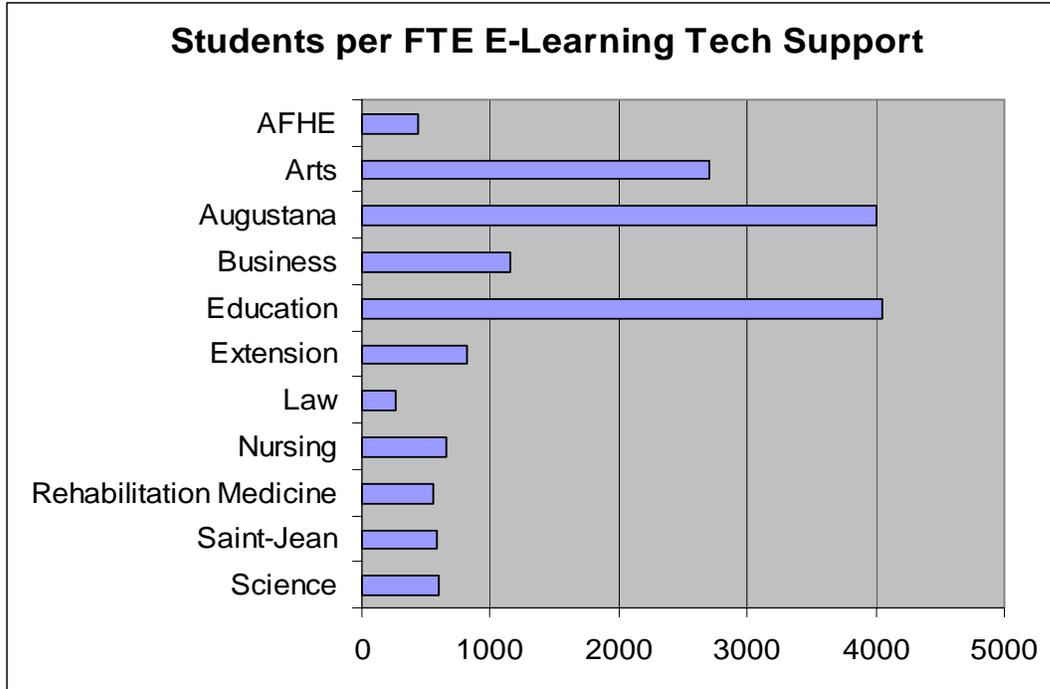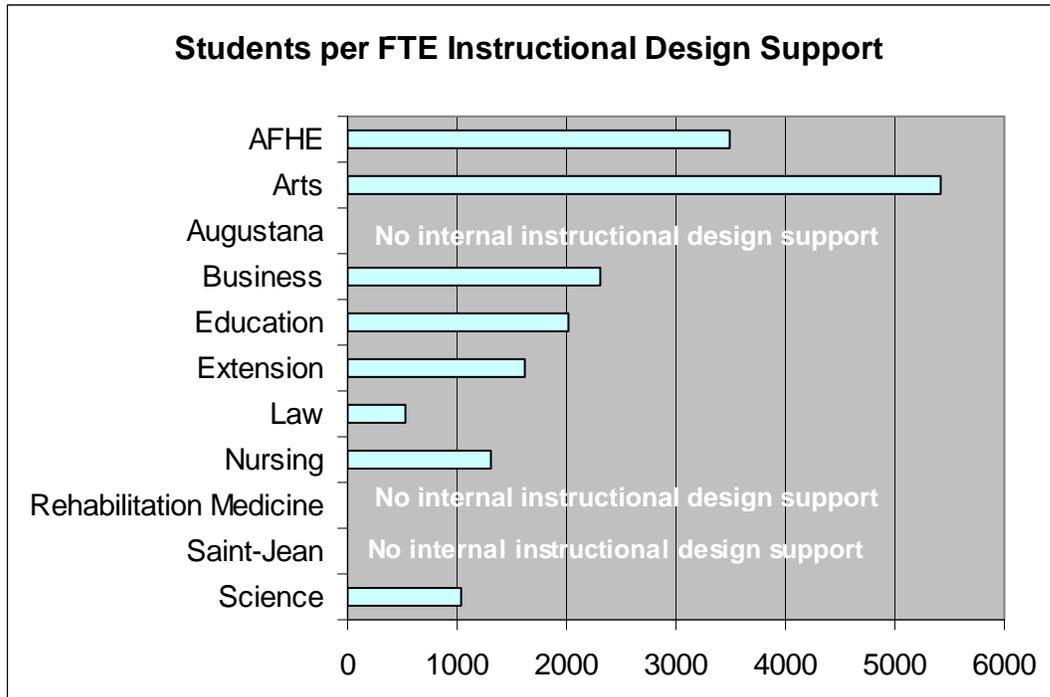
Figure 3

Figure 4

Figure 5

Figure 6

E-Learning Themes and Recommendations

In developing the major recommendations of the report, the committee first identified important themes related to e-learning and then expounded on the opportunities and challenges presented in the context of each theme. In most cases the opportunities and challenges led naturally to identifiable recommendations. Following another round of discussions many of the themes and recommendations were refined and reorganized. The committee was aided in this latter process by focusing on the goal for teaching and learning found in the current University Strategic Plan, namely, that the University has graduated and must continue to graduate the leaders of tomorrow.

The recommendations developed in this section form the basis of the E-Learning Action Plan that is developed in the next section. It delineates the strategies, timelines, and costs associated with implementing the recommendations developed in this section.

Learning Environments for Tomorrow's Leaders

If the University of Alberta is to achieve its goal of preparing students for successful careers as tomorrow's leaders and enhance opportunities for continuing personal and professional growth, it is imperative that we provide our students with the best learning opportunities possible given the available budget. A generally agreed-on starting point is implementing the *Seven Principles of Good Practice in Undergraduate Education* as enunciated by Chickering and Gamson (1987) listed previously in the *E-Learning in Higher Education* section.

In 1993 Chickering and Ehrmann revisited the Seven Principles in the light of the rapid development and deployment of new forms of information technology in support of learning. Of particular note were the following comments they made related to active learning.

> Learning is not a spectator sport. Students do not learn much just sitting in classes listening to teachers, memorizing prepackaged assignments, and spitting out answers. They must talk about what they are learning, write reflectively about it, relate it to past experiences, and apply it to their daily lives. They must make what they learn part of themselves.

> The range of technologies that encourage active learning is staggering. Many fall into one of three categories: tools and resources for learning by doing, time-delayed exchange, and real-time conversation. Today, all three usually can be supported with "worldware," i.e., software (such as word processors) originally developed for other purposes but now used for instruction, too. (p. 5)

Three earlier University of Alberta reports have recommended increased support for and use of active learning: the 1995 and 1996 reports on e-learning and the recent report on integrating teaching and research. In reality the University has made little headway in this area, primarily because of a continual reduction in resources for supporting teaching and

learning that has led to increased class sizes as Faculties cope with a growing number of students. The excellence of our undergraduate programs is at risk as class sizes grow. This need not be the case. Recent work by Twigg (2003) and the National Center for Academic Transformation (NCAT) has found that educational technologies can be used to improve the experience of learners, especially in courses with large enrollment, in some cases with reductions in cost. In addition, flexible programming achieved through e-learning may be used to increase the accessibility of university degrees for students at a distance. Over time, NCAT has required partnering institutions to use increasingly robust research methods to evaluate both the educational and fiscal results of course redesign projects. The outcomes achieved by universities supported by NCAT's current round of funding will provide much needed research data.

Although NCAT researchers and others have demonstrated approaches for utilizing e-learning that may be cost effective, there are many factors to be considered in any educational situation. It is too early to conclude in which cases these techniques can reliably reduce costs while maintaining or improving educational outcomes, an essential requirement. In this Report we have taken the approach that the enhancement of teaching and learning with e-learning is an investment that will typically require immediate increased costs to lay the foundation for longer term improvement. There may eventually, but not necessarily, be cost efficiencies. With computer technologies in general, we have seen that as our knowledge of a particular technology matures the associated refinement of processes and applications support cost containment, and in some cases cost reduction.

A primary goal of the University is to provide exemplary learning environments for our students regardless of whether e-learning is employed. For many learners, face-to-face instruction will remain central to their University of Alberta experience. E-learning should be flexibly integrated with existing teaching methods in a manner that is compatible with each instructor's teaching preferences, appropriate to capabilities of the learners, and attuned to the nature of the discipline. The most effective instructors promote active learning using methods support by educational research. We need to ensure that all instructors have the opportunity to develop their abilities to teach. Knowledge about teaching strategies that are particularly appropriate for e-learning and how to use applications such as WebCT are crucial for those electing to incorporate information and communications technologies.

For the University to realize the full potential of e-learning, it will require personal transformation of the knowledge, skills, and values of many of our educators. A comprehensive professional development program is essential for guiding instructors as they integrate active learning and selectively implement educational technology. This program should encompass an extensive range of topics as well as a variety of methods including workshops, mentoring, online resources, and communities of practice. Although many faculty are interested in using e-learning, they also are protective of the time they need to do their research. Support services should be planned with the understanding that faculty members have many competing demands and efficiency is a priority. As well as promoting comprehensive instructional models, readily implemented

techniques for improving teaching should be proposed so that faculty with limited time may improve their teaching gradually.

The existing courses and workshops offered by UTS, Technology Training Centre (TTC), and AICT E-Learning provide a solid foundation on which to expand professional development opportunities in the University. Teaching staff also rely on ongoing support as they redesign their courses. A number of approaches should be undertaken so as to accommodate the limited time, and learning preferences of educators. Some of this assistance can be provided by central service units such as AICT E-Learning. Also, instructors benefit from collaborating with instructional designers who are familiar with teaching and e-learning strategies that are attuned to the characteristics of a particular discipline or program of studies. It is critical that sufficient expertise be available at the Faculty or department level[6] to support adequately the course transformation targets defined by each Faculty as part of its academic plan. The following recommendations must be implemented in order to meet these targets.

Recommendation 1
Existing University-wide professional development programs and Web-based resources should be expanded to guide increasingly larger numbers of instructors as they implement active learning methods, incorporate digital resources, and explore the capabilities of e-learning technologies. These professional development programs will also augment the knowledge and skills of faculty-based e-learning support staff as well as graduate students involved in teaching.

Recommendation 2
Through a combination of central support services and faculty-based support, instructors will receive the technical and instructional design support necessary to implement efficiently active learning strategies and e-learning in their courses.

Recommendations 1 and 2 provide part of what is required to progressively improve learning environments. In the next recommendation, this incremental approach is complemented by larger-scale course-redesign projects that will demonstrate substantially different approaches to teaching through the use of e-learning. More rapid learning innovation and change will be promoted through special project funding which will stimulate the larger-scale transformation of courses and programs. Special projects will involve cross-functional team composed of instructors and e-learning specialists. In this way, time efficiencies are created and the individual workload for each instructor is reduced.

---

[6] Given that almost all instruction occurs within Faculties, this term has been used throughout the report to avoid confusing readers. However, independent academic units such as Health Promotions Studies are recognized as full partners in both implementing and benefiting from the recommendations and strategies.

Recommendation 3
A special projects fund will be created to support the transformation of learning in areas where significant gains can be made in terms of enhancing learning.

The goal of this program is to enhance the quality of learning through the selective application of e-learning. The incentives associated with this recommendation consists of special project funding for course redesign projects. Any initiatives to reduce costs should ensure that learning outcomes are not being negatively affected. Indeed, when appropriate, learning outcomes should be improved by any course redesign project. Academic goals identified by the University will serve as the basis for the criteria used to select projects.

Preparing our Learners for Success

Today's high school graduates tend to be more technologically knowledgeable than earlier generations. However, it would be a mistake to think that they are necessarily prepared to participate as active learners. Meyer (2005) writes,

> Faculty often realize that students are not as ready for independent learning as their age or college admittance implies, some are quite needy and require more attention, and they may have beliefs that college is about listening to experts (a belief that they have had confirmed in K-12 schools and/or by their families). (p. 22)

Active learning requires that students participate in the learning process by using the content knowledge, not just memorizing it. Active learning activities may be used to augment lecture-oriented approaches as one means for promoting a deeper understanding of course content. Instructors using teaching methods that promote active learning may or may not use e-learning. The challenge for educators is that students may be unaccustomed to the extra effort that active learning activities require and uncertain about the instructor's expectations. Because learners may not realize the benefits, they may also resist assuming a more proactive role.

It also is crucial that students be information-literate. This means that they can "recognize when information is needed and to have the ability to locate, evaluate, and use effectively the needed information" (Presidential Committee on Information Literacy, 1989). Although these abilities have always been important, they have now become essential because of the proliferation of information available from a host of sources.

The specific knowledge and skills necessary for being a successful active learner and those for being information-literate vary according to the discipline. Therefore, programming to ensure that students have the necessary skills in active learning and information literacy is best implemented at a Faculty or department level as an integral part of the curriculum.

Recommendation 4
Each Faculty is strongly encouraged to ensure that students are capable of successful participation as active learners and that they have essential information literacy skills. Related educational programs and resources will incorporate active learning strategies. A University-level working group will be established to explore ways of providing core introductory instruction or resources on active learning and information literacy that would serve as a foundation for Faculty programs.

Acquiring and Creating Sustainable Educational Resources

The University is fortunate to have many outstanding faculty who are excellent teachers and recognized international experts. Many are creators of knowledge and are willing to invest time and effort to prepare learning materials in their fields. Furthermore, instructors increasingly rely on materials in a variety of digital formats such as text, voice, graphics, video, and animations. The University must provide support for faculty in this creative activity together with the packaging and maintenance of the associated intellectual property in the form of learning objects. The term "learning objects" is introduced within this report to familiarize the reader with a field of educational inquiry and practice that is of growing importance for universities.

A learning object is generally defined as being a digital resource that can be reused to support learning (Wiley, 2002). Examples of learning objects include, but are not limited to, such resources as digital video, audio, pictures, diagrams, simulations, written work, and electronic presentations such as PowerPoint slides. Each of these resources can be designed to be re-usable instructional components that may be delivered over the Internet and employed in a number of educational contexts.

Because of the emphasis on designing learning objects to be reused for a range of purposes, these types of resources represent an opportunity to enhance the quality and contain the production costs of developing e-learning resources. Learning object repositories are online collections of learning objects that are indexed so that instructors and learners may easily locate learning objects relevant to their needs. One of the best known learning object repositories is the Multimedia Educational Resource for Learning and Online Teaching commonly referred to as MERLOT. To learn more and obtain learning objects from this repository please visit www.merlot.org.

Although many faculty members are interested in building their own personalized educational resources, customized production services are often costly and difficult to offer on a large scale. A strategy is needed that provides sufficient support for the sustainable development or selection of digital resources.

It is to our great advantage that the number of well-designed digital resources for e-learning is increasing rapidly. Available through publishers, software companies, and nonprofit organizations, these are affordable options to the on-campus production of educational resources. Ongoing improvements in e-learning applications for media development have resulted in cost-effective means for producing digital resources.

Increasingly, these materials are being designed according to standards that make them easily reusable and more easily integrated as learning objects into learning management systems such as WebCT.

Recommendation 5
All instructors should be able effectively to identify, acquire, and integrate learning objects. This will be achieved through a combination of enhanced professional development activities about digital resources and the ongoing support of e-learning specialists. The University also will undertake selected projects in conjunction with Faculties that demonstrate the sustainable production, acquisition, and maintenance of learning resources.

Responsive Support

The increasing technical sophistication of students and faculty is resulting in a culture that is open, indeed eager, to enriched learning through the use of educational technologies. The dramatic increase in the use of educational technology means that the University now depends on e-learning support services being responsive to the needs of thousands of instructors and tens of thousands of students. Not all of them have access to newer computers and high speed Internet connections. A growing number of students and instructors are at a distance, and involved part-time. English may not be their first language. Users with cognitive and physical disabilities require specialized support to ensure that e-learning serves as a bridge rather than a barrier. Support services must be designed to accommodate the widely varying needs and capabilities of both students and instructors.

Experience in the University of using WebCT as the primary learning management system has been mixed. Its introduction and initial adoption brought challenges, and more recently conversion from WebCT Campus Edition to the Vista Edition has been difficult, with too few people to cope with growing demand and inadequate computing infrastructure to provide reliable and responsive performance. It is also perceived that AICT should be able to work more closely with Faculties and departments to leverage the expertise present on campus.

More people are now committed to the AICT E-Learning Support group, and additional computing infrastructure has been purchased. Although this will improve the current situation, the WebCT community wants guarantees that they can count on a learning content management system that is reliable and responsive. The campus community has stressed that this is fundamental prerequisite for the growth of e-learning within the University.

Also, many instructors believe that WebCT does not scale well for their needs. It is frequently regarded as a *one-size-fits-all* or a *heavy-hammer* solution. Fortunately, WebCT has heard this message from customers and is developing new versions that are more flexible in accommodating varying users' abilities and preferences. In combination with the greater use of standard templates, this should allow AICT with the assistance of the University community to deploy WebCT more effectively and efficiently.

Furthermore, customized solutions are needed as well as options for Faculty-based administration of e-learning services

Recommendation 6
In order to provide quality support and performance for e-learning systems, AICT will be asked to develop:
1. *reliable and responsive WebCT services;*
2. *a technology roadmap of future WebCT product offerings and how the University might take advantage of these;*
3. *a strategy to engage e-learning support personnel in departments and faculties in WebCT course creation and support;*
4. *plans for new or additional training required to support the WebCT roadmap;*
5. *risk assessment of our strategy to support primarily a single vendor product;*
6. *the benefits, risks, and costs of supporting alternative open-source products (e.g., sakai or moodle) in addition to WebCT;*
7. *a process for scanning broadly ranging University needs for information and communications technologies and for planning the evolution of e-learning support.*
8. *a plan for collaborating with Specialized Support and Disability services to ensure that Universal design principles are applied to all AICT supported courses.*

Research and Development of Campus-Wide Solutions

Presentation applications, communications technologies, and learning content management systems continue to become more powerful and, in some cases, designed to be easier for instructors to use. The effect of information technology on teaching and learning has just started. Several recent publications point to a wide variety of new technologies that are just coming or will soon be on the market. *The Horizon Report: 2005* (New Media Consortium, 2005) cites the following technologies placed into three adoption horizons: extended learning and ubiquitous wireless (broad adoption within the next year); intelligent searching and educational gaming (adoption within two to three years); and context-aware computing and social networks and knowledge webs (adoption within four to five years). New forms of course delivery on USB memory devices and class interaction using personal response system (or clicker) system technology are now available. In the more distant future, the use of intelligent learning support agents (or tutors) shows promise.

In addition to assessment of the influences of new technology, new areas of application need to be explored. Examples include the introduction of e-portfolios, the creation of international experiences in the courses through the use of Internet technologies, and deployment on a broad scale of support for communities of practice.

Information technology budgets are limited, and selecting one technology often means that another will not be supported. The educational outcomes enabled through any given technology or application must be weighed against the related costs to buy, support, and maintain it. Direct and indirect costs incurred in switching from one campus-wide solution to a comparable alternative must also be considered. Despite these challenges,

the University must be proactive in embracing emerging technologies and applications as part of achieving educational excellence. An ongoing process must be established to research and evaluate new educational technologies for campus use.

Recommendation 7
The University will establish a strategy for collaborating with instructors, students, and e-learning support staff to research, evaluate, and where appropriate recommend campus-wide implementation of new educational technologies and applications as part of cultivating superior learning environments and a spirit of innovation in teaching and learning.

University buildings that will accommodate thousands of students each day are in the early design stages. Educators are considering innovative learning space designs that will shape teaching and learning strategies for decades to come. The classroom of the future may have dynamically changing walls or no walls at all. How the student is supported and the type of interaction the student has with the instructor and classmates will probably change dramatically. Students will learn more by working in small groups supported by tutorial-style guidance from humans or possibly intelligent agents.

The issue of class size will not disappear. Although some university administrators promote the merits of mass lectures, others argue that technology-enabled learning spaces rather than classrooms are essential for teamwork and collaboration. Planners are justifiably cautious about basing the design of durable concrete structures on teaching practices and technologies that are rapidly evolving. As examples of good practice at this University, the planning committees for the Centennial Centre for Interdisciplinary Studies (CCIS) and the Health Sciences Ambulatory Learning Centre (HSALC) are each involved in exploring building designs that will be flexible and capable of accommodating leading-edge educational practices for many decades to come. Fortunately, guidelines for designing learning spaces are now emerging (Oblinger, 2005), and the University should continue to build further expertise in this area.

Recommendation 8
Building planners will collaborate with Faculties in the early stages to explore designs that are conducive to active learning and adaptable to future changes in educational practices. Processes will be reviewed to ensure that decisions about the design, maintenance, and renewal of classroom technologies will involve academic representatives as well as technical specialists. Before the new or renovated facilities are completed, the University will involve instructors and students in researching, developing, and evaluating instructional strategies that will make optimal use of the new teaching spaces.

The ongoing costs of providing support and maintaining teaching technologies must be considered. The current approach of not including the costs of technology support in proposals for new buildings is creating considerable and unsustainable pressures on the classroom support budget.

Recommendation 9
The existing committee (TEISAC) responsible for central computing labs will address the evolving campus-wide requirements for technology in the computing labs. Working with Planning and Infrastructure, the VP (Information Technology) will review the process for upgrading classrooms to ensure that optimal use is made of existing funding allocated to upgrading the technology in classrooms and FAR (Facilities Alterations Requests) funding. If possible, an ongoing sustainable fund for infrastructure upgrades in smart classrooms will be established.

Recommendation 10
The importance and use of information technology in support of teaching and learning, research, and administration is growing rapidly, and so the costs of installing and refreshing information technology must be considered in the initial costs of construction and the ongoing maintenance of a building. These costs should not be treated as an afterthought late in the construction phase, and a refresh cycle appropriate to the technology must be planned with adequate funding support.

Evaluating Outcomes

The University community has ample knowledge of and experience in evaluation and action research. The recommendations and strategies in this report are intended to build on this expertise to ensure that e-learning is implemented to the greatest advantage for both learners and the University.

Evaluating outcomes for redesigned courses that incorporate e-learning requires a comprehensive approach that includes assessing learning and measuring organizational results in the context of Faculty and departmental priorities. Students' satisfaction is often not specific enough to be the sole measure for assessing the quality of instruction or the merits of e-learning. Some learners are reluctant to make the additional effort required to engage actively with course content. Furthermore, instructors' class ratings are at risk when the educational technologies in use fail to meet functional and performance requirements. It is critical that administrators recognize that instructors may be penalized on course evaluations as they explore new teaching methods. Measuring students' experience provides valuable information, but not necessarily the complete picture. It should be combined with other methods for evaluating the instruction provided.

Many universities and not-for-profit organizations have developed methods for assessing educational innovation. The Center for Academic Transformation emphasizes that technology can be used to make optimal use of resources while maintaining or improving learning outcomes. The colleges and universities partnering with the Center have used a number of research methods for evaluating the learning outcomes achieved in their course redesign projects including:
*   Pre-, post-, and follow-up tests;
*   Comparing the performance of students in redesigned courses with the performance of those in comparable courses that have not been redesigned;
*   Performance in subsequent courses;
*   Frequency of enrollments in senior-level courses;

- Students' and faculty's perceptions as expressed in surveys and focus-groups.

Although improving learning outcomes is paramount, assessing the organizational implications of e-learning also is crucial given its significant direct and indirect costs. In *Honoring the Trust: Quality and Cost Containment in Higher Education,* Massy (2003) writes that university educators "don't think deeply enough about the assessment of learning outcomes. They don't try regularly to substitute lower-cost for higher-cost processes while maintaining quality" (p. 6).

Fortunately, a number of large research projects have resulted in detailed approaches for analyzing the implications of using educational technologies. The *Technology Costing Methodology Project*[7] sponsored by the US Department of Education's Fund for the Improvement of Postsecondary Education provides a detailed system for tracking costs related to e-learning. Another excellent resource titled *Modeling Resource Use in Teaching and Learning with Technology* (Ehrmann & Milam, 2003) has been developed by the Teaching, Learning and Technology Group.

An immediate goal for the University is to implement a comprehensive set of measures for evaluating the educational and organizational outcomes achieved through integrating e-learning with theory-based teaching practices. These measures will be applied during special projects to obtain an understanding of the factors contributing to superior learning environments and to the appropriate implementation of e-learning.

Recommendation 11
Instructional strategies used to incorporate e-learning should be tracked and evaluated to determine their effectiveness in improving learning outcomes, while containing costs. It is understood that although it is desirable to seek efficiencies, learning outcomes must be maintained or improved. During this process, it will be recognized that instructors who explore new instructional methods require time and appropriate support to develop, pilot, and revise their practice

Integrating Teaching and Research
The University's Academic Plan emphasizes the importance of integrating teaching with research. Involving undergraduate students in research not only serves to differentiate a university education from that received in a college, it is a means for involving learners actively in examining critical research questions. Through their direct experience with research, students develop a profound appreciation of the structure of knowledge and inquiry in their disciplines.

Programs that integrate research with teaching may make significant demands on department resources. Effective and efficient strategies must be established that can achieve this institutional goal. Many of these strategies are embodied in the 17 recommendations presented in the report from the working group on integrating teaching

---

[7] More information on the Technology Costing Methodology Project is available at:
www.wcet.info.projects.tcm

and research. The report also provides many excellent examples of how instructors have incorporated their research into their teaching at the undergraduate level.

Scholarship and research into teaching and learning also need to be recognized more broadly across the University as critical components of the efforts to integrate teaching and research. Funding support for this type of scholarship should be encouraged at the federal, provincial, and institutional levels.

Recommendation 12
The recommendations of the "Integrating Research and Teaching at the University of Alberta: Creating a Foundation for an Inquiry-Based Life" should be reviewed. Those recommendations that are selected should be implemented in conjunction with the recommendations of this report to ensure that an e-learning plan that supports the integration of teaching and research on campus be developed and continue to evolve.

Committing to Online Programs

The University of Alberta has identified as a goal attracting and satisfying learners throughout their life span. These lifelong learners may be part-time students who require the flexibility afforded by online programs, as well as graduate students, professionals, those learning in the workplace, and non-formal learners such as seniors participating in special programs. Because of this, online programs represent important opportunities for program growth for the University not only locally, but also nationally and internationally. For many of these people, learning online will be their first impression of the University and will affect their decision whether to return for additional experiences. Program viability depends on robust e-learning planning and support.

Online programs have a number of common attributes. Although these may be shared with campus-based programs that employ e-learning, online programs are unique in terms of their pervasive use of technology. Also, online programs tend to experience the influence of e-learning support more profoundly than many, although not all, of their campus counterparts. Some of the attributes shared by online programs are:

- time-shifting is usually involved (including learners in different time zones);
- instruction is heavily dependent on good learning design;
- technology use is ambitious and often requires reliable, multifunctional communications technologies;
- online programs seek to increase access through flexibility;
- users judge the program and the University by their virtual teaching and learning experiences;
- part-time and/or off-campus learners support needs that are different from full-time students;
- student orientation programs such as those proposed for information literacy and active learning are especially critical;
- on-campus sessions are occasional and intense and require ample advance planning;

- students require access via the Internet to University learning services such as the Bookstore and the Libraries.

It is important to remember these points as the University reaches out to learning communities that have not previously been well served such as Northern, Aboriginal, and international learners.

The above characteristics of online programs are described more fully in Appendix F. They underline the reality that many online program administrators find e-learning a high-stakes enterprise that involves many administrative and pedagogical issues.

Recommendation 13
The unique needs of University online programs serving students at a distance require centrally provided e-learning support services that are flexible and robust. Services should include:
1. *extended hours of help-desk support for instructors and students, which may include evenings and weekends;*
2. *centrally supported high-performance synchronous communication tools;*
3. *service-level provisions for high system availability and performance on weekends and times such as Reading Week when on-campus students may be away from class.*

Sufficient resources must be provided to meet these needs. The University should state its commitment to ensuring the ongoing success of online learning programs.

Achieving Leadership in Learning

A general consensus of the E-Learning Plan Committee was that the University needs an organization or structure to coordinate, and where appropriate lead, future e-learning initiatives. For the purposes of this report, the title Centre for Creative Learning Initiatives (CCLI) is used for this organization.

In particular CCLI might be responsible for or have some part in strategies for carrying out most of the above recommendations (1-5, 7-9, 11-13). CCLI would be headed by an academic director. Its role is to be engaged with and leverage the activities of faculty and e-learning support staff in the Faculties, departments, and as appropriate the AICT E-Learning and UTS. Its most obvious role would be to solicit transformation projects (see Recommendation 3) and provide some oversight and coordination as funded projects are carried out.

Recommendation 14
A concept proposal for a Centre of Creative Learning Initiatives (CCLI) will be developed as soon as possible, with a completion date of no later than January 30, 2006 The overall goal is to have a comprehensive CCLI proposal completed by April 1, 2006. Shortly thereafter, the search process for its director will be initiated.
The following will be key partners with CCLI:
- *All Faculties and academic units,*
- *Undergraduate and graduate students,*

- *University Teaching Services (UTS),*
- *AICT E-Learning,*
- *Learning Services (including the University Libraries, the Bookstore and Museums),*
- *Student Services*

Instituting an Adaptive Planning Process

The recommendations and strategies in this report reflect the current state of the University and today's e-learning environments. However, change should not be delayed until the next major planning cycle. Stakeholders seek a means to continue to inform the development of policies, priorities, and operational decisions affecting e-learning on campus. The University also requires the capacity to respond flexibly to the continually evolving needs and opportunities associated with e-learning. There should be regular studies of how faculty are teaching and how students are learning at the University as well as the roles that existing and emerging educational technologies might fill. A review of effective support strategies within Faculties might also encourage sharing best practices not only for teaching, but also for providing support services.

Much can be achieved through Faculties, instructors, and technology specialists collaborating with each other. Broadly based input from Faculties, students, and support staff from both central and faculty-based units is needed for exploring policy issues, promoting educational best practices, and discussing the role of emerging technologies. Care must be taken to ensure that committee members mirror the diverse population of stakeholders within the University.

Recommendation 15
The University will establish a Teaching, Learning, and Technology Council. This body will meet regularly to consider issues that influence learning environments, the viability of emerging educational technologies, and priorities for funding and support. This council will advise the Vice-Provost (Information Technology), the Director of CCLI, and other constituents as they develop e-learning policies and plan support strategies. The membership of the Council would include faculty members from each Faculty, online program administrators, faculty-based e-learning support staff, students, and representatives from relevant campus service organizations (e.g. AICT, Libraries, Bookstore, Student Services, and UTS).

Celebrating Our Successes

Although some Faculties are beginning to recognize the effort and creativity needed to support e-learning approaches, better measures are needed to determine the success of these efforts, and greater recognition is needed of the effort involved. Consideration should be given for new award(s) in this area as well as awarding course Web sites with *best-practice* designations based on an agreed-on set of evaluation criteria.

Recommendation 16
This recommendation has three related parts:

1. *University-wide criteria for evaluating blended learning environments will be established by developing a set of standard questions to be incorporated into the Universal Students' Ratings of Instruction when technology is used as part of teaching.*

2. *Faculties are encouraged to develop FEC guidelines for evaluating teaching that involves e-learning.*

3. *One or more new awards in the area of innovation in teaching and learning using information technology should be created. The University-wide evaluation criteria developed as part of this recommendation should be used as a basis for selecting award-winners.*

Examining Intellectual Property

The academic world has changed markedly since the copyright policy in University Academic Staff Agreement was crafted in the 1970s. Initiatives such as the Creative Commons[8] recognize that many types of intellectual property may be assigned to online resources. Both the intellectual property rights of instructors and University policy need to be clarified in the light of contemporary digital technologies. This will involve extensive discussions between the University and the Academic Staff Association.

Recommendation 17
In close collaboration with the Academic Staff Association, Non-Academic Staff Association, students' unions, and the University should develop a policy on the intellectual property rights associated with online course materials.

---

[8] Information about the Creative Commons is available at: http://creativecommons.ca

The Action Plan: How, Who, When and How Much

To carry out a plan of action based on the recommendations from the previous section it is necessary to identify i) how the recommendation will be carried out (i.e., what strategy), ii) who will carry it out, iii) when it will be carried out and iv) how much will it cost. This section defines the report's E-Learning Action Plan by providing these four components for each of the recommendations.

Recommendation 1
Existing University-wide professional development programs and Web-based resources should be expanded to guide increasingly larger numbers of instructors as they implement active learning methods, incorporate digital resources, and explore the capabilities of e-learning technologies. These professional development programs will also augment the knowledge and skills of faculty-based e-learning support staff as well as graduate students involved in teaching.

Strategy: UTS will develop the additional programs and resources in collaboration with e-learning specialists, AICT E-Learning personnel, and experienced instructors with advanced knowledge in e-learning. To accomplish this, UTS will require additional resources to support Web-based programs and resources and to tie into existing international efforts in this area such as the TLT and its Flashlight Program, the Center of Academic Transformation, and EDUCAUSE's Learning Initiative. UTS will also need additional funds to extend their professional development program in this area. Finally, resources will be required to add new training sessions in the areas of blended learning and evaluation as outlined in Recommendations 3 and 11.

Timing: To be carried out starting this fall with additional resources assigned over the next three years.

Resource Requirements:

Resource (operating funds)	2006-07	2007-08	2008-09	2009-10
Instructional developer	$ 70,000	$ 70,000	$ 70,000	$ 70,000
Prof. Development Program Manager	80,000	80,000	80,000	80,000
Program funding	30,000	40,000	50,000	50,000

Recommendation 2
Through a combination of central support services and faculty-based support, instructors will receive the technical and instructional design support necessary to implement efficiently active learning strategies and e-learning within their courses.

Strategy: This recommendation is the most far-reaching of those presented in this report. It requires deep investments in both centralized support for e-learning and support for additional e-learning expertise in the Faculties. Additional funds are necessary to provide

quality production-level support for our WebCT Learning Management System. The resources for this level of support will come through a combination of reallocation of existing resources in AICT plus additional resources.

As pointed out in the discussion of the theme *Learning Environments for Tomorrow's Leaders*, resources must be allocated in the Faculties for the acquisition of additional e-learning expertise to assist in program and course transformations. These resources should come from a combination of reallocation of existing resources within Faculties plus new resources. To embark on real transformation, we recommend at least 20 new positions should be added to various Faculties with a goal of adding additional positions possibly through planned reallocation of resources within Faculties. These positions should be allocated over a four-year period, matching the period of funding for transformation projects as described in Recommendation 3.

Timing: To be carried out starting in 2006-2007, with additional resources assigned over the next four years.

Resource Requirements:

Resource (operating funds)	2006-07	2007-08	2008-09	2009-10
Additional e-learning support positions in AICT E-Learning*	$150,000	$300,000	$300,000	$300,000
Additional e-learning support positions in Faculties	$375,000	$750,000	$1,125,000	$1,500,000

* E-Learning Support group in AICT was allocated 4 new positions in 2005-06. The funding for these positions and those in 2006-07 have come from reallocation of funds in the Vice-President (Academic) portfolio primarily due to the closure of ATL.

Recommendation 3
A special projects fund will be created to support the transformation of learning in areas where significant gains can be made in terms of enhancing learning.

Strategy: Project-based funding of $500K per year will be required over four years to assist in program and course transformation efforts. This funding will be applied for through the Provost's office with the expectation that at least five projects per year would be funded. The selection criteria for these projects will be aligned with the academic plan of the University as it is developed. At present, themes forming the basis of this plan include improving the undergraduate experience, integrating research with teaching, developing a northern strategy, aboriginal engagement, rural engagement, interdisciplinary collaboration, and international engagement. Improving the undergraduate experience is a multidimensional theme that may encompass projects that focus on increasing the use of active learning activities, improving large enrolment courses, and/or increasing the accessibility of instruction to students with special needs.

Large-class transformation projects would focus on developing a large first year course with no overall increase in costs to provide more effective learning. The transformation practices prescribed by Twigg (2003) and the National Center for Academic Transformation would be adopted when appropriate to guide large-class transformation projects.

Project funding could be requested over a two- to three-year period. It is important that an approved transformation project should have sufficient resources and expertise to sustain the transformation effort. Additional staff required to sustain a transformation project should be requested as part of a project proposal. These additional staff might be allocated from the new positions identified in Recommendation 2. The two recommendations for 20 additional staff and at least 20 transformation projects over a four-year period is not coincidental. Four years is believed to be a realistic time frame in which to begin significant, sustainable innovation and change through the recommendations described in this report. The need to continue past 2010 to support new transformation projects and add more support staff should be assessed in year three (2008-2009) of this process.

Timing: To be started in April 2006 with $500K funding each year for four years.

Resource Requirements:

Resource (non-operating)	2006-07	2007-08	2008-09	2009-10
Learning Enhancement Projects (5 or more a year)	$500,000	$500,000	$500,000	$500,000

Recommendation 4
Each Faculty is strongly encouraged to ensure that students are capable of successful participation as active learners and that they have essential information literacy skills. Related educational programs and resources will incorporate active learning strategies. A University-level working group will be established to explore ways of providing core introductory instruction or resources on active learning and information literacy that would serve as a foundation for Faculty programs.

Strategy: A series of working-group meetings would be arranged among stakeholders in order to determine the level of interest in developing learning resources that could be used to promote information literacy on campus. Some Faculties wish to introduce information literacy concepts as parts of various courses in their programs and may not be interested in more focused or structured approaches for providing information literacy skills. Others may be interested in having introductory training sessions available for students who enter their programs with insufficient skills in using information technology. These sessions could be conducted by the TTC, possibly in conjunction with Library Services. Other Faculties may wish to provide a more in-depth course for

academic credit. Some core modules would be developed by Computing Science, with
special modules being developed by individual Faculties.

Interested stakeholders to date include Learning Services (Library and TTC), Computing
Science, Education, Medicine and Dentistry, and Arts.

Timing: Initial working-group meetings would be held in fall 2005 with the goal of
producing a set of recommendations for an information-literacy strategy by April 2006.
Implementation could begin in the 2006-2007 academic year.

Resource Requirements:

Resource (non-operating)	2006-07
New training/learning module acquisition and development	$100,000

Recommendation 5

*All instructors should be able effectively to identify, acquire, and integrate learning
objects. This will be achieved through a combination of enhanced professional
development activities about digital resources and the ongoing support of e-learning
specialists. The University also will undertake selected projects in conjunction with
Faculties that demonstrate the sustainable production, acquisition, and maintenance of
learning resources.*

Strategy: UTS will develop the additional professional development programs and
resources in collaboration with e-learning specialists with CCLI, AICT E-Learning
personnel, and experienced instructors in the area of learning-object selection,
management, and development. The costs of this activity are incorporated in the costs
described in Recommendation 1.

Special project funding to support the development of learning materials as reusable
learning objects will be provided on an annual basis. Projects that focus on developing
learning materials that relate to research activities undertaken by University faculty
members will receive special consideration. Applicants will in many cases be expected to
find matching funding from government or private-sector partners.

Timing: To be carried out starting this fall on a trial basis with additional resources
assigned over the next three years.

Resource Requirements:

Resource (non-operating)	2006-07	2007-08	2008-09	2009-10
Seed funding for learning object dev	$250,000	$250,000	$250,000	$250,000

Recommendation 6
In order to provide quality support and performance for e-learning systems, AICT will be
asked to develop:
1. *reliable and responsive WebCT services;*
2. *a technology roadmap of future WebCT product offerings and how the University*
    might take advantage of these;
3. *a strategy to engage e-learning support personnel in departments and faculties in*
    WebCT course creation and support;
4. *plans for new or additional training required to support the WebCT roadmap;*
5. *risk assessment of our strategy to support primarily a single vendor product;*
6. *the benefits and costs of supporting alternative open-source products*
    (e.g., sakai or moodle) in addition to WebCT;
7. *a process for scanning broadly ranging University needs for information and*
    communications technologies and for planning the evolution of e-learning support.
8. *a plan for collaborating with Specialized Support and Disability services to ensure*
    that Universal design principles are applied to all AICT supported courses.

Strategy: Members of the AICT E-Learning group working together with a small group
of (4-5) representatives from various Faculties, UTS, and the Vice-Provost (Information
Technology) office will undertake the seven action items above. The results of their work
will be reported to the Provost and Vice-Provost (Information Technology) and to the
Provost and Vice-Provost (Information Technology) and to the Faculty-based ICT
Committee in their December 2005 meeting or as soon as possible in the new year.
Recommended actions forthcoming from this report will be implemented on as soon as
possible.

Timing: To be carried out immediately.

Resource Requirements:

Resource	2005-06
Additional resources needed	Yet to be determined

Recommendation 7
The University will establish a strategy for collaborating with instructors and e-learning
support staff to research, evaluate, and where appropriate recommend campus-wide
implementation of new educational technologies and applications as part of cultivating
superior learning environments and a spirit of innovation in teaching and learning.

Strategy: Continual scanning and planning for new information technology used in
support of learning will be an increasingly important activity. An e-learning forecast and
planning specialist will be hired to collaborate with instructors and e-learning support

staff in AICT and the Faculties to assess the effects of new and emerging technologies. This specialist will also interact with key stakeholders from industry, the Bookstore, and Library Services in carrying out his or her duties. He or she will report to the Director of the Centre for Creative Learning Initiatives and will act as a resource for the Teaching, Learning, and Technology Council and for projects funded in Recommendations #3 and #5.

Timing: Position to be created in 2006-2007 when CCLI becomes operational.

Resource Requirements:

Resource (operating)	2006-07	2007-08	2008-09	2009-10
E-Learning Forecast & Planning Officer	$80,000	$80,000	$80,000	$80,000

Recommendation 8
Building planners will collaborate with Faculties in the early stages to explore designs that are conducive to active learning and adaptable to future changes in educational practices. Processes will be reviewed to ensure that decisions about the design, maintenance, and renewal of classroom technologies will involve academic representatives as well as technical specialists. Before the new or renovated facilities are completed, the University will involve instructors and students in researching, developing, and evaluating instructional strategies that will make optimal use of the new teaching spaces.

Strategy: Action on this recommendation has already started. The University Architect, who reports to the Vice-President (Facilities and Operations), has begun a consultative process involving the Vice-Provost (Information Technology), AICT, and Faculty representatives on new buildings with learning spaces. The process needs to be more formalized with appropriate sign-off at the functional design stage of new building construction.

Timing: At present, planning for two buildings, Centennial Centre for Interdisciplinary Sciences and the Health Science Ambulatory Learning Complex, is at the functional design stage. These will proceed with the current informal process for designing learning spaces. A more formal process should be developed for future new building projects.

Resource Requirements: No new resources anticipated at this time.

Recommendation 9
The existing committee (TEISAC) responsible for central computing labs will address the evolving campus-wide requirements for technology in the computing labs. Working with Planning and Infrastructure, the Vice-Provost (Information Technology) will review the process for renovating classrooms to ensure that optimal use is made of existing funding allocated for upgrading the technology in classrooms and FAR (Facilities Alterations Requests) funding. If possible, an ongoing sustainable fund for infrastructure upgrades in

smart classrooms will be established.

Strategy: At present, TEISAC is dedicated to deciding on funding for new and upgrades to existing computer labs with computer technology. It is recognized that learning spaces are becoming less distinct and that unscheduled learning environments using wireless connections can easily be created. It is recommended that this committee work to ensure that the needs of learners for access to information resources be supported anywhere on campus. Furthermore, money earmarked for installing technology in renovated classrooms is not always utilized each year as necessary facility renovations have not been completed. The process for upgrading classrooms will be reviewed to ensure that all Faculties have an equitable number of smart classrooms.

Timing: To be carried out starting this fall with additional resources assigned over the next three years.

Resource Requirements: Over the next three years an additional $200K per year will be needed to fund the ongoing management of existing classroom and lab spaces and to undertake the expanded role of supporting wireless connections in casual (unscheduled) learning spaces.

Resource (operating)	2006-07	2007-08	2008-09	2009-10
Additional learning space support	$60,000	$130,000	$200,000	$200,000

Recommendation 10
The importance and use of information technology in support of teaching and learning, research, and administration is growing rapidly, and so the costs of installing and refreshing information technology must be considered in the initial costs of construction and the ongoing maintenance of a building. These costs should not be treated as an afterthought late in the construction phase, and a refresh cycle appropriate to the technology must be planned with adequate funding support.

Strategy: This recommendation can implemented by ensuring that the initial costs of information technology in support of learning spaces are included in the cost of a new building or renovated space in an existing building. Once in place the funds to refresh the technology should be provided through the existing computer lab and smart classroom budgets, which will now form the basis for the learning spaces budget in accordance with Recommendation 9.

Timing: To be carried out on all future new building and buildings currently in the planning stage.

Resource Requirements: Additional one-time funding will be required for new building projects. Additional funding for ongoing maintenance and refreshing of equipment in existing learning spaces is requested in Recommendation 9.

Recommendation 11
Instructional strategies used to incorporate e-learning should be tracked and evaluated to determine their effectiveness in improving learning outcomes, while containing costs. It is recognized that although it is desirable to reduce costs, learning outcomes must be maintained or improved. During this process, it will be recognized that instructors who explore new instructional methods require time and appropriate support to develop, pilot, and revise their practice.

Strategy: Additional professional training in evaluation should be developed by UTS: evaluation in a broad sense that is not only focused on student outcomes, but also on course planning, design, and implementation. Special projects undertaken by the E-Learning Forecast and Planning Officer and/or by the Centre for Creative Learning Initiatives will be evaluated using various methods to measure learning outcomes and relative cost benefits.

Timing: To be carried out starting in April 2006.

Resource Requirements: UTS funding for additional resources and professional development events is identified in Recommendation 1. Funding for the E-Learning Forecast and Planning Officer is under Recommendation 7. The funding for Centre for Creative Learning Initiatives is under Recommendation 14.

Recommendation 12
The recommendations of the report "Integrating Research and Teaching at the University of Alberta: Creating a Foundation for an Inquiry-Based Life" should be reviewed. Those recommendations that are selected should be implemented in conjunction with the recommendations of this report to ensure that an e-learning plan that supports the integration of teaching and research on campus be developed and evolved.

Strategy: Strategies for implementing the recommendations in the *Integrating Research and Teaching* report should be developed by the Vice-President (Research), the Vice-Provost (Information Technology), and others identified as integrally connected to or affected by the recommendations.

Timing: To be carried as soon as possible and completed by July 1, 2006.

Resource Requirements: The resources required are unknown at this time and will depend on the strategies chosen in implementing the recommendations.

Recommendation 13
The unique needs of University online programs serving students at a distance require centrally provided e-learning support services that are flexible and robust. Services should include:
1. *extended hours of help-desk support for instructors and students, which may include evenings and weekends;*

2. *centrally supported high-performance synchronous communication tools;*
3. *service-level provisions for high system availability and performance on weekends and times such as Reading Week when on-campus students may be away from class.*

Sufficient resources must be provided to meet these needs. The University should state its commitment to ensuring the ongoing success of online learning programs.

Strategy: The Vice-Provost (Information Technology), working together with Online Program Interest Groups and AICT, will review how the special needs of the online programs can be more adequately serviced. The Vice-Provost (Information Technology) will work with the Provost to provide a more definitive position on the priority of online programs and courses in the forthcoming Academic Plan.

Timing: To be carried out starting this fall with additional resources assigned in the next two years.

Resource Requirements:

Resource (operating)	2006-07	2007-08	2008-09	2009-10
Additional online support	$60,000	$60,000	$60,000	$60,000
Synchronous communication	$60,000	$100,000	$100,000	$100,000

Recommendation 14
A concept proposal for a Centre of Creative Learning Initiatives (CCLI) will be developed as soon as possible, with a completion date of no later than January 30, 2006 The overall goal is to have a comprehensive CCLI proposal completed by April 1, 2006. Shortly thereafter, the search process for its director will be initiated.
The following will be key partners with CCLI:
- *All Faculties and academic units,*
- *Undergraduate and graduate students,*
- *University Teaching Services (UTS),*
- *AICT E-Learning,*
- *Learning Services (including the University Libraries, the Bookstore and Museums),*
- *Student Services*

Strategy: The concept proposal will be developed by the Vice-Provost (Information Technology) with input from the key partners identified in the recommendation.

Timing: To be carried out under the direction of the Vice-Provost (Information Technology) in collaboration with the key partners named in the recommendation and in accordance with the timeline given in the recommendation.

Resource Requirements: The following cost estimate assumes that the Director will have an academic appointment and be seconded to the CCLI typically for a defined period (e.g., three years). He or she would be paid an honorarium in addition to a base salary and

would be expected to carry a half-time teaching load. Three e-learning support officers would be appointed in 2006-2007, one each to the health sciences area, the science and engineering areas, and the social science, humanities, and arts areas, as well as one specializing in large classes and University campuses outside of Edmonton.

The support officers will enhance the services available on campus and collaborate closely with AICT E-Learning, Faculty-based support staff, program administrators, and instructors. In addition, the support officers will promote new initiatives, co-ordinate the activities of the project team, provide design expertise, and monitor outcomes to ensure that superior learning outcomes are achieved using sustainable practices.

Resource (operating)	2006-07	2007-08	2008-09	2009-10
Director (stipend plus secondment recovery)	$50,000	$50,000	$50,000	$50,000
Four E-Learning Support Officers	$255,000	$340,000	$340,000	$340,000

Recommendation 15
The University will establish a Teaching, Learning, and Technology Council. This body will meet regularly to consider issues that influence learning environments, the viability of emerging educational technologies, and priorities for funding and support. This council will advise the Vice-Provost (Information Technology), the Director of CCLI, and other constituents as they develop e-learning policies and plan support strategies. The membership of the Council would include faculty members representing each Faculty, online program administrators, faculty-based e-learning support staff, students, and representatives from relevant campus service organizations (e.g. AICT, Libraries, Bookstore, Student Services, and UTS).

Strategy: The terms of reference for the Teaching, Learning, and Technology (TLT) Council will be developed by the Vice-Provost (Information Technology) in collaboration with the key partners named in Recommendation 14. It is important that the Council's relationship with the Faculty-based ICT Committee and the GFC Committee on Learning Environments (CLE) be clearly established. A CLE sub-committee, co-chaired by the Vice-Provost (Information Technology) and the Vice-Provost (Academic) will develop a governance model for CCLI and the TLT Council. CLE will approve the terms of reference and TLT Council membership.

Timing: To be carried out by April 30, 2006 under the direction of the Vice-Provost (Information Technology).

Resource Requirements: No major resource implications.

Recommendation 16
This recommendation has three related parts:
1. *University-wide criteria for evaluating blended learning environments will be established by developing a set of standard questions to be incorporated into the*

Universal Students' Ratings of Instruction when technology is used as part of teaching.

2. *Faculties are encouraged to develop FEC guidelines for evaluating teaching that involves e-learning.*

3. *One or more new awards in the area of innovation in teaching and learning using information technology should be created. The University-wide evaluation criteria developed as part of this recommendation should be used as a basis for selecting award-winners.*

Strategy: The criteria for evaluating the quality of blended learning would be developed by the TLT Council. CLE will approve the criteria. Faculty Evaluation Councils are encouraged to look at measures for assessing the quality of a faculty member's contribution to improving their teaching through the use of e-learning. For example, these Councils might use one or more of the following means for measuring the quality of the contribution:

- peer review of the instructor's teaching portfolio

- published articles about the evaluation of the outcomes achieved through the faculty member's use of e-learning

- adoption of his or her e-learning resources and teaching strategies by other instructors within the University as well as at other institutions

- evidence of participation in other activities that demonstrate involvement in the scholarship of teaching such as leading sessions about teaching methods for UTS

Timing: To be carried out under the direction of the Vice-Provost (Information Technology) and the Vice-Provost (Academic) starting with the formation of the TLT Council. Approval for the University-wide criteria must be sought from CLE. Probably the first year this recommendation could come into effect would be 2007-2008 academic year.

Resource Requirements: Difficult to determine at this time, but estimated to be less than $10K for initial costs and less than $5K for ongoing operating costs.

Recommendation 17
In close collaboration with the Academic Staff Association, students' unions, Non-Academic Staff Association, students' unions, and the University should develop a policy on the intellectual property rights associated with online course materials.

Strategy: Because instructors may soon wish to share developed course materials externally using vehicles such as Creative Commons, it is important that the University, the Academic Staff Association, the Non-Academic Staff Association and student unions begin discussions on IP rights associated with course materials. Input for these discussions should be sought from the TLT Council established in Recommendation 15.

Timing: This recommendation should be implemented in the next year or two at the latest.

Resource Requirements: Resource requirements are difficult to determine at this time. If an agreement requires the disclosure of all IP related to course materials that is to be freely shared or licensed, this could require a significant and ongoing (>$100K) investment on an ongoing basis.

Summary and Conclusion

Table 2 summarizes the responsible units, the timing, and the costs of the various strategies identified for the 17 recommendations. It is clear that the recommendations require a mixture of immediate action and long-range planning. Some carry little or no costs; others require large or yet-to-be-determined investments. Because of the major effect of this report, it has been circulated widely in the University community for discussion and feedback and is to be presented to a number of administrative and academic committees. Please refer to page 4 of this report for an overview of this collaborative process. Feedback through this process has been reviewed and revisions have been made to the E-Learning Report in response in preparation for sending the report to GFC and EPC for approval of funds.

The committee strongly believes that the *E-Learning Report'*s recommendations and strategies will generate a constructive, responsive environment where University instructors will receive the support they need to use e-learning. Students will also participate in learning environments that prepare them not only for success as lifelong learners, but also to become leaders who dare to discover. The *E-Learning Report* provides a foundation for a process to continue to review and improve our learning environment by the full engagement of the University community in an ongoing effort to examine the issues, explore the emerging technologies, and determine the priorities.

Table 2: E-Learning Budget 2006 - 2010

Rec. #	Resource (operating funds)	Funded Unit	2006-07	2007-08	2008-09	2009-2010
1	Instructional developer	UTS	$ 70,000	$ 70,000	$ 70,000	$ 70,000
1	Professional Development Program Manager	UTS	80,000	80,000	80,000	80,000
1	Program Funding	UTS	30,000	40,000	50,000	50,000
2	New e-learning support positions (CNS)	AICT	150,000	300,000	300,000	300,000
2	New e-learning support positions (Faculities)	Faculties	375,000	750,000	1,125,000	1,500,000
6	Resources to be determined	AICT				
7	E-Learning Forecast & Planning Officer	CCLI	80,000	80,000	80,000	80,000
9	Additional learning space support	AICT	60,000	130,000	200,000	200,000
13	Additional online support	AICT	60,000	60,000	60,000	60,000
13	Synchronous communication	AICT	60,000	100,000	100,000	100,000
14	Director (stipend + secondment recovery)	CCLI	50,000	50,000	50,000	50,000
14	E-Learning Support Officers	CCLI	255,000	340,000	340,000	340,000
	Annual budget (operating)		**$ 1,270,000**	**$ 2,000,000**	**$ 2,455,000**	**$ 2,830,000**

Rec. #	Resource (one-time funding)		2006-07	2007-08	2008-09	2009-2010
3	Transformational projects: 5 per year	Faculties	500,000	500,000	500,000	500,000
4	New learning module acquisition & development	Faculties	100,000			
5	Seed funding for learning object development	CCLI	250,000	250,000	250,000	250,000
	Annual budget (non-operating)		**850,000**	**750,000**	**750,000**	**750,000**
	Total annual budget		**$ 2,120,000**	**$ 2,750,000**	**$ 3,205,000**	**$ 3,580,000**
	Total Allocation by Unit	UTS	$ 180,000	$ 190,000	$ 200,000	$ 200,000

References

Advisory Committee for Online Learning (2001). *The E-learning e-volution in colleges and universities: a pan-Canadian challenge.* Toronto: CMEC. Retrieved July 05, 2005 from http://www.cmec.ca/postsec/evolution.en.pdf

Bernard, R. M., Abrami, P.C., Lou, Y., Borokhovski, E., Wade, A., Wozney, L., Wallet, P.A., Fiset, M., & Huang, B. (2004).How does distance education compare to classroom instruction? A meta-analysis of the empirical literature. *Review of Educational Research, 74*(3), 379-439.

Boyer Commission on Educating Undergraduates in the Research University. (1998). Reinventing undergraduate education: A blueprint for America's research universities. Retrieved June 8, 2005, from: http://naples.cc.sunysb.edu/Pres/boyer.nsf/

Boyer, E. (1990*). Scholarship reconsidered: priorities for the professorate.* Princeton, NJ: Carnegie Foundation for the Advancement of Teaching.

Bransford, J.D., Brown, A.L., Cocking, R.R., Donovan, M.S., Pellegrino, J.W., & National Research Council (Eds.). (1999). How people learn: Brain, mind, experience, and school. Washington, DC: National Academy Press.

Bransford, J.D., Brown, A.L., Cocking, R.R., Donovan, M.S., Pellegrino, J.W., & National Research Council (Eds.). (1999a). How people learn: Bridging research and practice. Washington, DC: National Academy Press.

Burns, T., & Ungerleider, C. (2003). Information and communications technologies in elementary and secondary education: A state of the art review. *International Journal of Educational Policy, Research, & Practice*, 3(4), 27-54.

Caruso, J. (2004). *ECAR study of students and information technology, 2004: convenience, connection, and control.* EDUCAUSE Centre for Applied Research. Retrieved June 8, 2005, from: http://www.educause.edu/ers0405/

Centre for Educational Research and Innovation (CERI). (2005). *E-Learning in tertiary education: Where do we stand?* Paris: OECD.

Chickering, A.W., & Ehrmann, S. (1996). Implementing the seven principles: Technology as lever. *AAHE Bulletin*, **48**, pp. 3-6.

Chickering, A.W., & Gamson, Z.F. (1987). Seven principles for good practice in undergraduate education. *AAHE Bulletin*, **39, 3-7.**

Christensen, C.M., Aaron, S., & Clark, W. (2003). Disruption in education. *EDUCAUSE, 38*(1), 45-53.

Dede, C. (2005). Planning for neomillennial learning styles. *EDUCAUSE Quarterly, 28*(1), 7-12.

Draft themes for joint meeting of Deans and Chairs. (2005). *The academic plan: Themes*. University of Alberta. Retrieved June 8, 2005, from: http://www.uofaweb.ualberta.ca/academicplantoolkit//pdfs/DeansChairsThemesFinal.pdf

Ehrmann, S.C., & Milam, J.H.. (2003). *Modeling resource use in teaching and learning with technology, Version 2.0.* The Flashlight Program.

Garrett & Verbik (2004). *Online learning in commonwealth universitie: selected data from the 2004 Observatory survey, Part 1 & Part 2*. The Observatory on borderless higher education, London, UK. Retrieved July 05, 2005 from www.obhe.ac.uk

Hiltz, S. R., & Goldman, R. (2005). *Learning together online. Research on asynchronous learning networks*. Mahwah, NJ: Lawrence Erlbaum Associates.

Huber, M. T. (1999). Developing discourse communities around the scholarship of teaching. *Carnegie Chronicle-Supplemental Material*. National Teaching and Learning Forum, October 1999, Volume 8, Number 6. Retrieved July 05, 2005 from: http://ntlf.com/html/lib/carnegie/86huber.htm

Integrating research and teaching at the University of Alberta: creating a foundation for an inquiry-based life. (2004). Edmonton, AB: University of Alberta, Working Group on Teaching and Research. Retrieved June 8, 2005, from: www.uofaweb.ualberta.ca/researchandstudents//pdfs/FinalReportWorkingGroup.pdf

Learning first: An agenda for technology integration at the University of Alberta. (1996). Edmonton, AB. University of Alberta, Learning Support Systems & Academic Technologies for Learning.
Retrieved June 8, 2005, from:http://www.ualberta.ca/REPORTS/learn1st.pdf

Massy, W.F. (2003). *Honoring the trust: quality and cost containment in higher Education.* Boston, MA: Anker.

Meyer, K.A. (2005). Planning for cost-efficiencies in online learning. *Planning in Higher Education, 33*(3), 19-30.

New Media Consortium. (2005). *Horizon report 2005*. Retrieved June 8, 2005, from: www.educause.edu/ir/library/pdf/CSD3737.pdf

Oblinger, D. (2005). Leading the transition from classrooms to learning space. *EDUCAUSE Quarterly*, *28*(1), 14-18.

Pirani, J. (2004). *Supporting E-learning in higher education*. EDUCAUSE Center for Applied Research. Retrieved June 8, 2005, from: http://www.educause.edu/ir/library/pdf/ERS0303/ecm0303.pdf

Prescott, M. & Curry J. (2004). *External review of the University of Alberta e-learning support units.*
Retrieved June 8, 2005, from:
http://www.vpit.ualberta.ca/elearning_plan/pdf/elearning_review.pdf

Presidential committee on information literacy final report. (1989). American Library Association. Retrieved June 8, 2005, from:
www.ala.org/ala/acrl/acrlpubs/whitepapers/presidential.htm

Quality investment in Alberta's future—2004 update to 2002-06 strategic business plan. *Edmonton, AB. University of Alberta.*
Retrieved June 8, 2005 from:
http://www.uofaweb.ualberta.ca/strategic//pdfs/bp2004FinalBoGApprovedMarch19.pdf

Schulman, L. (2005). *The signature pedagogies of the professions of law, medicine, engineering and the clergy: Potential lessons for the education of teachers.* Teacher Education for effective teaching and learning workshop, NRC, Irving, CA, Feb. 6-8, 2005. Retrieved July 05, 2005 from
http://hub.mspnet.org/media/data/Shulman_Signature_Pedagogies.pdf?media_000000001297.pdf

Slavin, R. E. (1990). *Cooperative learning: theory, research and practice.* Englewood, NJ: Prentice Hall.

Technology in learning—Executive summary. (1995). Edmonton, AB. University of Alberta, University Senate Task Force.
Retrieved June 8, 2005 from:
http://www.uofaweb.ualberta.ca/senate/nav03.cfm?nav03=12506&nav02=12501&nav01=12483

Twigg, C. (2003). Improving learning and reducing costs: New models for online learning. *EDUCAUSE Review*, *38*(5), 28-38. Retrieved June 8, 2005, from:
www.educause.edu/ir/library/pdf/erm0352.pdf

Wiley, David. A. (2002). *The Instructional Use of Learning Objects.* Bloomington, IN: Association for Educational Communications and Technology.

Appendix A: Central Services Supporting E-Learning

University Teaching Services

University Teaching Services (UTS) has offered professional development sessions for instructors since 1980. UTS relies upon teaching faculty for delivering the majority of the workshops and seminars that are offered.

Ten years ago UTS programs had only about 8% of its sessions devoted to e-learning. These sessions were facilitated by teaching faculty who had adopted technology as part of their teaching practice and who were enthusiastic about sharing their insights. In recent years, the number of sessions related to e-learning has increased to 35% of the yearly program offerings. Although teaching faculty continue to deliver the majority of these sessions, staff from AICT, Academic Technologies for Learning, Technology Training Centre, and the Arts Resource Centre also have volunteered their time and expertise to the UTS professional development program.

In September 2005 the theme of the UTS Fall Program is *Best Practices* and invited faculty will be asked to share pedagogical practices in their discipline while making explicit the ways in which they are using technology in their teaching. As a result, every session offered will have some component that deals with integrating technology with teaching.

Academic Technologies for Learning

Academic Technologies for Learning (ATL) started its operations in 1996. Its mandate was to support faculty members seeking to improve learning outcomes through incorporating technology in their teaching. Originally, ATL had four major areas of activity:
- planning and project development,
- instructional materials production,
- researching and evaluating programs,
- information and training.

Several rounds of the Government of Alberta's Learning Enhancement Envelope (LEE) afforded the funds necessary for higher education to undertake multimedia development projects. ATL played a significant role adjudicating, administering, and evaluating the LEE projects. In addition, many instructors receiving LEE funding chose to use their grants to purchase services from ATL.

For five years, the ATL Partnership Program provided instructors with teaching release time so that they could spend six months working intensively on redesigning their courses in ATL's Production Studio. This successful program enabled ATL's instructional designers, evaluator, and multimedia team to develop substantive relationships with a total of 48 faculty members. Many exemplary instructional CD-ROMs and course Web sites were created. As well, these early adopters developed a deep understanding of strategies for integrating technology with instructional practices that are supported by

research evidence. Today, many former ATL partners continue to be leaders in using technology to enhance learning outcomes in their respective faculties.

Over time, ATL services moved away from full-scale multimedia production and Web development to specialize in the following activities:

- designing blended learning environments;
- assessing learners' needs and preferences;
- evaluating outcomes achieved through course redesign projects;
- understanding and disseminating research methodologies associated with educational technology and learning;
- conducting applied research on teaching and learning with technology;
- offering professional development sessions for instructors;
- producing prototypes and templates.

As mainstream instructors embraced educational technology, the Partnership Program was no longer as appropriate. Many faculty members often could not set aside the time necessary to maintain the time-intensive and prolonged relationships associated with being a Partner. In response to the changing nature of the population of instructors using technology, ATL launched a series of initiatives that were better attuned to instructors' needs and priorities. ATL's expertise in instructional design and evaluation led to its participation in a number of national research projects.

As a result of the restructuring of University e-learning support units, ATL concluded its operations in March 2005.

E-Learning, Academic Information and Communications Technologies (AICT)

Central e-learning services at the University of Alberta have grown from two on-going projects housed and managed by AICT. The WebCT Initiative was established in 1997 by a campus committee created to select a centrally-supported e-learning platform for online course development and education. The University Digital Collections (SunSITE Alberta) Project was established in 1998 to develop a central object repository to house campus-wide academic and research digital collections.

WebCT (Web Course Tools)

The WebCT Initiative has evolved into one of the largest WebCT installations in the world. WebCT provides an integrated learning management system enabling the online delivery of some or all of a course. Widespread adoption has led to a significant growth in the number of courses with a WebCT component. From 375 courses in 1998/1999 with 14,000 student registrations, University of Alberta participation has increased to more than 3,000 courses and over 175,000 student registrations during the 2004/2005 academic year.

In addition to managing the systems underpinning this application, E-Learning in AICT delivers student orientation sessions and professional development workshops for instructors. The group collaborates with UTS in addition to assisting Faculty-based instructional support units.

AICT E-Learning also collaborates with Departments to seamlessly integrate PeopleSoft data with WebCT for such functions as automated class lists and grade books. It has established WebCT interfaces for data management systems and learning object repositories such as the University of Alberta Digital Collections projects. AICT E-Learning continues to work with faculty members to monitor and evaluate emerging educational technologies to ensure that the University's e-learning environment continues to meet the needs of the campus community.

As a result of the efforts of AICT E-Learning, Sun Microsystems designated the University of Alberta as a Centre of Excellence for E-Learning in 2001. This is the first such designation given for e-learning and the first Centre of Excellence established at a Canadian university. Sun Microsystems recently published a white paper on the University's experiences with implementing and supporting large-scale installations of WebCT. AICT E-Learning is collaborating with Sun on the development of benchmarking and scaling models for eventual publication. Sun contributes more than half of the funds required to produce, develop and test applications required to maintain the University as a Centre of Excellence.

AICT E-Learning is a member of the WebCT Vista Advisory Board, which comprises members from post secondary institutions worldwide. The Board's primary mission is to serve as a pedagogical and technical resource to shape the continuing evolution of WebCT's products and services. Through this partnership, the University participates in beta software tests and interface design efforts for new versions of the WebCT applications. Chosen as the first Canadian *WebCT Institute*, AICT E-Learning is one of 28 Institutes worldwide who are recognized for their leadership in e-learning. The Institutes collaborate and share resources in areas such as faculty development, research, and implementing large-scale WebCT installations.

University of Alberta Digital Collections
The University of Alberta Digital Collections (SunSITE Alberta) initiative provides students, researchers, instructors, and the general public with free access to a number of digital collections housed at the University. Current collections include:
- Bio-DiTRL: Digital Teaching Resources Library (Department of Biological Sciences);
- Mountain Park Repeat Photography Project (Department of Anthropology);
- Beaver County Sustainable Community mapping project (Department of Renewable Resources);
- Infectious Diseases Web Case Project (Faculty of Medicine & Dentistry);
- Virtual Museum (Museums and Collections Services);
- University Archives online finding aids;
- Digital Spatial Library (University Libraries);
- Atlas of Alberta Railways (University Press);
- Atlas of Alberta Lakes (University Press).

The Digital Collections initiative has grown from the original four University partners and five projects (Computing and Network Services, the University Library, Museums and Collections, and the Department of Biological Sciences) to include 13 partners supporting 17 projects, nine of which are Faculty or Department based.

Appendix B: Faculty Support for E-Learning

Faculty of Agriculture, Forestry, and Home Economics

Agriculture, Forestry and Home Economics (AFHE) support for e-learning is similar to that offered by other Faculties on campus. Current technical infrastructure includes a Faculty-wide level of core networked services. With resources allocated for file, print, collaboration/groupware and Web services being maintained centrally, support is a hybrid of local department staff offering an enhanced level of technical support with the ability to support a base level of e-learning requirements.

In the past, UTS and ATL have partnered with AFHE to provide expertise during the design and implementation of blended learning environments. The creation and delivery of multimedia generally has been dealt with by department support using an application oriented approach for the support of e-learning. WebCT is supported in the same fashion as other applications. One department has an instructional course design specialist, though the faculty has only one complete online course.

Faculty of Arts

The Arts Resource Centre (ARC) is an integrated service centre in the Faculty of Arts. The services provided by ARC include:
- Desktop, network, and server support;
- Applications development;
- Computing intensive research project support;
- AV/multimedia production support;
- Infrastructure and integration consulting services for research projects and initiatives;
- Instructional design;
- Professional development workshops and training;
- Computer assisted language learning (CALL);
- Lab administration & equipment loans;
- Resource library;
- Project room.

ARC has 16 staff joined by five student mentors from the Master's Program in Humanities Computing. A project room has been established for instructors to use on a drop-in or ongoing basis. Despite its extensive array of services, ARC has found it essential to partner with ATL and AICT to complement the services it offers to faculty members. For more information about ARC, visit http://www.uofaweb.ualberta.ca/arc/

The Department of Psychology has an Instructional Technology and Resources Lab (http://www.psych.ualberta.ca/~ITL/) that offers enhanced technical support attuned to the discipline-specific instructional needs of its instructors. Many courses in Psychology have large numbers of students. This along with dwindling resources reducing the availability of wet labs has led to a growing interest in educational technology in this Department (also see Faculty of Science description below).

School of Business

The School of Business uses the strategic goals of the University as the impetus driving its extensive ongoing efforts to enhance learning and learning environments. Using an enhanced technical support strategy, the School maintains a *Learning and Communications Technology Team*, made up of three full-time professionals dedicated to supporting learning/teaching activities. This service unit does not focus on the principles of adult education or instructional techniques, but rather is responsible for responding to technical support needs indicated by Faculty.

Relative to learning and e-learning services Business provides the following to its faculty:
- Course management system (Blackboard);
- Software distribution services (MSDNAA);
- Student e-portfolio service;
- Videoconferencing;
- Professional development and training services;
- Knowledge Base and "How To" document repository;
- Help Desk Services;
- Network infrastructure (wired and wireless);
- Desktop Support Services.

In addition to providing these services in-house, the School of Business actively participates with central service units to improve the quality of learning. These central services include:

- Smart classrooms (TRG/AICT);
- Computing labs (LABS/AICT).

The strategy of the School of Business is one of continuous improvement, continually asking the question *How can we make it better?* This strategy provides the basis for all learning and e-learning support activities. In alignment with this strategy the School of Business has formed partnerships with corporations and non-profit organizations including: IBM, TELUS, Bell, Oracle, Blackboard, Microsoft, and the Business Link.

An important tenant to the School's strategy involves measurement. The School of Business takes measures at regular intervals to assess the efficiency, effectiveness, and levels of satisfaction related to its services through the use of focus groups and surveys. These metrics serve to identify problem areas that require intervention for improvement as well as areas of achievement and success.

Faculty of Education

Education use of technology is influenced by a number of external organizations including the Ministry of Advanced Education, Ministry of Education, professional teaching organizations, school boards, parent groups, and research funding agencies.

In Education, the Technology Council develops and maintains a technology integration plan for the faculty. Instructors using technology benefit from the services available from the Division of Technology in Education (DTE), an integrated service centre. Services include the following:

- One-on-one consultation regarding instructional strategies, technology implementation, and instructor developed materials;
- Professional development activities to facilitate the creation of user-produced teaching, publication, display, and research materials;
- Desktop, network and server technical support for both administrative and educational systems;
- Private workrooms for media production and qualitative analysis available for staff and graduate students;
- Support for the development and delivery of individualized instruction.
- Equipment maintenance and rental.

Education has been a leader in using instructional technologies for decades. Mobile wireless labs can be brought to any classroom. There are wireless access points throughout Education in addition to Department-specific computer labs. This faculty currently offers three alternative graduate programs that use a blended model that combines online instruction with summer residencies.

The Technology Integration Plan was developed by the Council for Technology in Education. The Council is responsible for monitoring the implementation of the action plan and also for the development of policies and procedures regarding technology integration into teaching and learning, research and administration in the Faculty. The Council recommends priorities in the deployment of technology resources in the Faculty and develops and coordinates efforts to obtain financial support for the integration of technology into teaching and learning, research and administration. The Council is chaired by an Associate Dean and has broad representation from departments and units across the Faculty.

Faculty of Extension

The Faculty of Extension provides enhanced technical support in terms of e-learning support strategies. Programming units and instructors in Extension receive local support for standard desktop applications and network connectivity. A limited amount of support is also available for specialized applications that are used to support e-learning activities. This support is provided by a small team of information technology specialists that are responsible for maintaining the Faculty's infrastructure, back-end services, and user's desktop computing environments.

In addition to the core services provided by the information technology team, there are a number of resident administrative support staff and power-users that provide support to their specific programming units. Their efforts are typically limited to developing and maintaining Web content, supporting online course offerings in WebCT, instructor and student technical support, and a limited amount of production support.

The Faculty of Extension is also fortunate to have a small team of evaluation specialists and instructional designers that are available on a fee-for-service basis. The history of these individuals is well known to some: previously with ATL, which was dissolved March 31, 2005, they are now in the process of being reintegrated in the Faculty. Extension envisions this new unit (with the working name of Extension Learning Solutions) as providers of consultation and support on a per project basis with a fee-for-service attached. The proposed timeline for this unit to be functional is approximately July, 2005. Unfortunately, the demise of ATL has meant the loss of specialized technical personnel that provided back-end programming and server support, and media production support. The Faculty of Extension does not have the resources to replace these people.

Faculty of Law

The Faculty of Law IT support team is composed of two permanent and one temporary staff members who support faculty and five law institutes. Core services provided by this team include desktop support, network connectivity and application support.

The Faculty of Law Website enables students to access materials for certain courses. Law is using Westlaw-e-Carswell TWEN software as its course management system. The Faculty has found this to be an ideal solution for a number of reasons. Even the most non-technical faculty and students find the entire course management interface to be highly intuitive and simple to use. TWEN enables Web-based content editing as well as many other forms of management and access. One of the greatest benefits of TWEN is the connection it provides to the online Westlaw law library. This is currently the largest available law library and it is provided as a free service to students and professors alike, resulting in tremendous savings in money and time.

In addition to the robustness of the Westlaw online library's search capabilities, TWEN's HTML conversion of documents gives the option to automatically scan for citations and link them to the Westlaw database. TWEN's contact management system allows professors and students to interact easily through email, either individually or through email groups. Support for online forums and live discussions are included. Westlaw also has provided part-time personnel onsite to support to faculty, staff, and students using TWEN.

Faculty of Medicine & Dentistry

The Faculty of Medicine and Dentistry provides four professional degree programs, including the MD and DDS doctoral programs and Bachelor's degrees in Dental Hygiene and Medical Laboratory Science. In addition, the Faculty provides support for honors and specialization degrees in the basic biomedical sciences, and a large number of graduate students through FGSR. The four professional degree programs share a commitment to inquiry-based active learning strategies. The MD and DDS programs underwent a major overhaul in 1998, and this included the adoption of modern learning technologies as one objective.

Faculty-wide support for developing e-learning materials is lacking, although this is in transition at the time of preparation of this report. The Faculty is developing an integrated strategy to provide support for computing technologies in research bioinformatics, health informatics, and clinical informatics, which is taken to include educational technologies. This is under review by a Faculty committee chaired by the Dean.

Over the past ten years, most of the innovation in educational technology within Medicine and Dentistry has been conducted at the Department or instructor level, with the amount of e-learning activity varying in different subject areas. For example:

- The entire MD curriculum and the shared elements of the MD/DDS programs are supported by WebCT. About 60% of the undergraduate pathology content is delivered using WebCT modules, with links to clinical case material on the Virtual Museum site operated by the University Department of Museums and Collections Services.

- A sophisticated interactive on-line course in histology *(Histoquest)* has been implemented by Dr. David Begg and his team in the Division of Anatomy. This has replaced most of the histology lectures, and all the laboratory sessions.

- Course material related to evidence-based medical practice and clinical-decision making has been created by Dr. Rob Hayward and his colleagues in the Centre for Health Evidence.

- In the field of continuous professional learning, the Department of Family Medicine has created CD-based video modules for rural practitioners, in order to teach procedural skills.

Our needs for e-learning support and technology will certainly increase over the next several years, in response to a number of factors.

- **Clinical education in rural and regional sites** increase the need for advanced distributed learning technologies. The same e-learning technologies are also applicable to our postgraduate programs in Family Medicine and the specialties, and to continuous professional learning for health professionals from all four programs. As a secondary benefit, this may help integrate undergraduate and postgraduate education with life-long professional learning.

- **Simulations** technology is playing an increasing role in health sciences education, and this is heavily dependent on computer support. We are planning the introduction of an interim simulations laboratory in the new Zeidler-Ledcor Centre over the next year, and a definitive simulations unit will *be* housed in the Health Sciences Ambulatory Learning Centre that will be operational in 2010.

- **Interprofessional learning** is becoming a top priority of government as well as health sciences educators. These needs also will be addressed in the new interprofessional Health Sciences Ambulatory Learning Centre. Medicine and Dentistry needs to have technologies and support that are flexible enough to accommodate the needs of all the health sciences Faculties working together.

Faculty of Nursing

The Faculty of Nursing promotes the use of flexible delivery which it defines as "a wide range of instructional design strategies and communication technologies that may be used to increase educational opportunities and access by overcoming barriers of distance and time." After the inception of a flexible delivery doctoral program, Nursing found an ongoing demand for this type of approach at all program levels. It now has a Masters program with a number of courses that are available for students at a distance. Nursing continues to expand the number of flexibly delivered course offerings for all of its students.

Nursing has implemented an e-learning consulting and enhanced technical support strategy. It has on staff a Flexible Delivery Co-ordinator who actively collaborates with computer specialists who provide enhanced technical support to the Faculty. The Flexible Delivery Co-ordinator assists instructors as they adapt their teaching strategies for learning environments that span space and time. She also collaborates with learners to ensure that they have the knowledge and skills necessary to be successful in alternative learning environments. A variety of delivery systems are supported in the faculty:

- WebCT Vista
- Videoconferencing
- Teleconferencing
- One-way video
- Webcasts

Faculty of Rehabilitation Medicine

The Faculty of Rehabilitation Medicine currently uses a basic technical support strategy that is supported by the Rehabilitation Medicine Technology Group (RMTG). The Occupational Therapy (OT) department provides enhanced technical support to their instructors by utilizing an e-learning consultant. The e-learning consultant collaborates frequently with the RMTG but otherwise works independently with the OT department. The e-learning consultant provides professional development sessions but does not provide instructional design consulting.

Faculty of Science

The Faculty of Science uses a basic technical support strategy, although the basic services are provided by the Departments themselves, not by the Faculty. Most Departments provided additional services to support e-learning.

Biological Sciences: BioDiTRL — Digital Teaching Resource Library
http://bio-ditrl.sunsite.ualberta.ca/
The Department of Biological Sciences provides enhanced technical support services to its instructors by maintaining a learning object repository with thousands of media items that include images, animations, videos, and text documents.

Chemistry: Instructional Resource Centre (IRC)
http://www.chem.ualberta.ca/~iip/IRC/
Chemistry supports an integrated service unit at a Department level. Its services include:

- Development and maintenance of Web resources
- Uploading material to WebCT
- Maintaining video and CD library
- Instruction and consultation on Internet publishing
- Production support for scanning, authoring, printing, and publishing resources such as: digital images, photographs, transparencies, MPEG video, etc.

Computing Science: Instructional Support Group (ISG)

http://www.cs.ualberta.ca/isg/index.html
The Department of Computing Science utilizes an enhanced technical support strategy. Its technical staff supports:

- Systems administration for instructional labs
- Administration of Oracle database server; support for instructors and students using this server
- Laboratory coordination by providing operational and administrative support
- Development of laboratory instructional materials and training and coordination of teaching assistants
- Technical support in instructional activities such as: online assignment submission and testing, course web site version management, scheduling, workgroup formation and management
- Provision of online supplementary resource materials (tutorials, examples)

Mathematics and Statistical Sciences:

In the Department of Mathematical and Statistical Sciences two FSO's offer enhanced support in the use of instructional computer laboratories. This includes management assistance with assignments, solutions, data files, self assessment materials, certain aspects of examinations, etc.

Psychology: Instructional Technology and Resources Lab

The Department of Psychology has an Instructional Technology and Resources Lab (http://www.psych.ualberta.ca/~ITL/) that offers enhanced technical support attuned to the discipline-specific instructional needs of its instructors. In addition, technical staff supports the following supplementary technical services for instruction:

- Systems administration, licenses and staff assistance for the department instructional lab.
- Custom Web server support for specialized course applications and a course management system, Moodle.
- Development of laboratory instructional materials.

Faculté Saint-Jean

Faculté Saint-Jean has a full-time certified LAN administrator who oversees all computer systems and desktop support in the Faculté. This person is also responsible for Faculté's wireless environment and videoconferencing systems. The LAN administrator occasionally has student assistance with his many duties.

Faculté Saint-Jean has created a Centre d'Aide en Technologie. The Centre d'aide is a full-service technical support unit. Staff and students have access to a wide range of hardware and software tools and are given assistance in the use of these tools. The director of the centre has a computing science background and is a specialist in the area of technology training. The Centre is also staffed by students and is open from 8:00 a.m. 4:30 p.m. five days a week.

Technology Plans

The faculties who have technology and/or e-learning plans are:
- Academic Support Centre, Learning Resources
- Business
- Education
- Nursing
- St. Jean
- St. Joseph's College

Appendix C: Integrating Teaching and Research Through E-Learning Tools and Strategies

The integration of teaching and research is one of the most important issues facing the University of Alberta. In order to provide an exceptional learning environment for our students at both the undergraduate and graduate levels, the University must find a way to ensure that research benefits the learning environment in tangible and meaningful ways. It has been identified as an important theme in the upcoming University Academic Plan, and has also been emphasized by the incoming President Indira Samarasekera as an issue that must be addressed for the University to provide the best possible learning environment for our students. There are numerous ways on our campus that e-learning tools and strategies can be, and are being, used to help faculty integrate teaching and research more effectively.

The effective and creative use of information technology was one of the main themes in the Commission report, *Reinventing Undergraduate Education: A Blueprint for America's Research Universities* (1998). The report states that *research universities, because of their size and academic mission, are far more likely than other institutions to possess the technological capabilities for twenty-first century teaching in any area*. The recommendations of the Boyer Commission stress the importance of ensuring adequate technology skill development for students and faculty so that they are well-placed to develop and use new e-learning tools and strategies to enrich the student learning environment.

In December 2003, the University established the Working Group on Teaching and Research, under the Vice-President (Research), to examine the current state of the integration of teaching and research on campus. The submissions from each of the Faculties presented in the recent report of the Working Group on Teaching and Research, *Integrating Teaching and Research at the University of Alberta: Creating a Foundation for an Inquiry-Based Life*, highlights several best practice examples from across campus where e-learning tools and strategies have been used to integrate teaching and research effectively. This appendix can be found at: http://www.ualberta.ca/researchandstudents .

Without exception, every faculty on campus has course materials available online for at least some of their courses, and has also begun to use course websites, WebCT, and other e-learning tools as regular components of their courses. The working group report appendices include examples of two main types of best practices of interest for the University E-Learning Plan - blended learning models and distance education models. Although not intended to be exhaustive, some of these best practice examples of the integration of teaching and research through e-learning tools and strategies include:

Blended Learning

- *Business 201* - This introductory business class, with annual enrolments of 400+ students, uses a traditional lecture and lab structure supplemented with an innovative, custom-built, web-based component that allows the instructor to have a collaborative, inquiry-based group project as the final course assignment.
- *Psychology 104/105* - The introductory Psychology courses require all students (4000+ per year) to complete information literacy tutorials online. These literacy tutorials complement other research-based inquiry components in the courses, including having students participate as research subjects in projects for senior undergraduate and graduate students. This experience is expanded for other courses in the department which use blended learning as well.
- *Nursing 301* - Two sections of this course, Nursing Research, are offered each year through a blended learning model. The course is delivered through an online WebCT platform with added classroom and teleconferencing components in order to introduce undergraduate Nursing students to issues in nursing research. This builds on other earlier required 100-level Nursing courses in Physiology and Pathophysiology, which introduce Nursing students to the use of WebCT.
- *Education Information Technology (EDIT) 202/486/488* - All education undergraduate students are required to take EDIT 202 to experience different technology tools for teaching and data communication, which prepares them to use these tools in their professional practice as a teacher. This is expanded through EDIT 486 and 488, which are specifically research-based courses focusing on principles of multimedia design and current research on communication. Education reports that technology, and research aspects of interactive media, are integrated into many of the undergraduate courses across the faculty. These perspectives are facilitated by instructors' use of WebCT, and the availability of three mobile computer labs for classroom use.

Distance Education

There are a few examples of entirely distance education programs at the graduate level that demonstrate a significant integration of teaching and research. These programs, which include the Master's program in Health Promotion Studies, Extension's Master of Arts in Communication and Technology, and some aspects of the Nursing master's and doctoral programs, use distance education (using WebCT and other online instructional tools and resources) with some classroom and teleconference components to supplement them. These programs, which recognize that traditional methods of program delivery limited access for potential students, use online distance education for all of their core courses, including research methods courses. A specific example is Nursing 503 Design and Conduct of Nursing Research, which is delivered through WebCT with added teleconferencing components.

Appendix D: Examples of Teaching and Learning Units

Deakin University

One example of technology integration is the teaching and learning Support Unit at Deakin University. This unit integrates work in four areas: educational design; academic professional development; training, support and education development for Deakin Studies Online; and evaluation and research in teaching and learning.

The Educational Design unit works with faculty on tasks such as "to identify the most appropriate model for flexible delivery or to successfully manage the completion of major program (re)developments in flexible learning." Academic Professional Development programs and activities are offered to faculty and staff seeking to improve their teaching or explore new models of learning.

The unit also manages an annual Online Teaching and Learning Fellowship program. Deakin Studies Online (DSO) refers to "Deakin University's online teaching and learning environment (WebCT Vista) which aims to enhance both on and off-campus learning. DSO delivers web-based course material and assessment tasks and facilitates communication and collaboration between staff and students." It includes a staff development section which provides online advice, step-by-step guides to tools, and examples. The Evaluating and Research in Teaching and Learning unit is responsible for administration of student evaluations. Deakin University's strategic plan for 2004 focused on teaching and learning and includes a Teaching and Learning Grant and new Teaching Excellence Awards. The Teaching and Learning Grant encourages applications from cross faculty teams and notes that successful completion of a funded project "would constitute a strong contribution to teaching and learning in relation to a promotion application." The Teaching Excellence Awards include a monetary component and are awarded yearly.

The University of Queensland

At The University of Queensland, the university's Teaching and Learning Enhancement Plan has six key priorities. These include making the link between teaching and research explicit, supporting coherent and innovative curriculum design and high-quality teaching and learning practices that include student engagement and small group interactions, and providing development opportunities and rewards to encourage teaching staff to be "innovative, effective and reflective practitioners." The strategic focus on teaching and learning is arranged under five initiatives: Enhancing Teaching and Learning, Flexible approaches to Learning, Teaching Excellence, Professional Development, and Assessment. Faculty support comes through the Teaching and Educational Development Institute (TEDI). Flexible learning is part of the University's overall strategy and through its website TEDI provides access to the university's resources on flexible learning, policies, guidelines and funding opportunities as well as research reports. The university has a specific First Year, Online Learning Funding Initiative which focuses on the programs and strategies to improve the first year student experience. Its Teaching Excellence sector includes awards for Excellence in Research Supervision.

The University of South Australia

The University of South Australia Flexible Learning Centre is one of several service units responsible for enhancing the teaching and learning environment for students and staff. With the Library, Student and Academic Services, and Information Strategy and technology Services, the Centre forms a service unit under the Associate Vice President: Access and Learning Support. The Centre plays a major policy and service role in facilitating the university's strategy for teaching and learning.

Flinders University

Flinders University has a Staff Development and Training Unit that provides support through courses and programs for faculty and staff on teaching and learning, flexible education, research, computer skills, leadership and management and Professional development. The Teaching for Learning website provides a wide variety of information on teaching and assessment and includes flexible learning as one component. Its modules can be used as stand-alone or self-paced modules for developing a teaching portfolio or part of a Graduate Certificate in Tertiary Education. The University also provides Innovation in Teaching grants and Awards for Excellence in Teaching.

E-Learning at the University of Central Florida

www.ucf.edu

The University of Central Florida (UCF) is a research institution with approximately forty thousand undergraduate and graduate students. E-learning supports the university's goals in the following key areas:
- improved access
- relief of classroom space shortage
- cost reduction/budget restraint
- increased convenience for traditional, on-campus students
- improved interaction

Each semester, more than half of UCF students are enrolled in at least one e-learning course. In a recent study, it was found that 90% of those taking fully online courses were also enrolled in face-to-face courses. The UCF Vice-Provost of Information Technologies and Resources believes that an important factor in their success is their understanding that "e-learning is at its core an instructional activity. It has to fit into the faculty culture and the campus environment, and finally it has to meet institutional goals. We approached it from that point of view."

The UCF team charged with implementing e-learning campus-wide recognized that redesigning courses to be Web-based means that instructors would need to fundamentally re-evaluate their course goals and teaching methods as well as learn basic technical skills. The e-learning support infrastructure is comprised of three units: Course Development and Web Services, The Centre for Distributed Learning and The Research Initiative for Teaching Effectiveness.

Course Development and Web Services creates research-based online teaching models and scalable systems that constitute the foundation for e-learning at UCF. Within this unit there are instructional design consultants, a digital media production team, and techrangers, students who work part-time to provide programming and technical support. Course Development and Web Services offers two comprehensive courses about e-learning best practices and using WebCT.

The Center for Distributed Learning is responsible for co-ordinating the expansion and marketing of learning programs. Finally, The Research Initiative for Teaching Effectiveness investigates faculty and student issues concerning e-learning. It also collaborates with faculty members involved in researching teaching and learning.

Stanford Center for Innovations in Learning, Stanford University

http://scil.stanford.edu

At Stanford University, The Stanford Center for Innovations in Learning (SCIL) seeks to advance *the science, technology, and practice of teaching and learning* through scholarly research. SCIL research projects are interdisciplinary and study educational issues involving teachers and students from elementary school through to higher education. SCIL is affiliated with the Wallenberg Global Learning Network that provides grants to foster international research collaborations. Research projects include: digital video collaboration and analysis, student electronic portfolios, teachable agents, and learning ecologies for the development of technological fluency.

SCIL supports innovation in teaching by providing a state-of-the art testing ground for instructors using educational technology to improve classroom teaching. Wallenburg Hall houses SCIL and serves as a learning center for faculty and students from more than twenty departments and schools within Stanford University. This facility provides instructors with hands-on experience in using technology-rich learning spaces that provide a rich array of alternatives including: video conferencing, in-class laptops, tablet PCs, reconfigurable furnishings and interactive whiteboards.

Appendix E: Centres for Research on Teaching and Learning

Center for Academic Transformation

http://www.center.rpi.edu

A centre that has focused on research concerning new media technologies is the National (US) Center for Academic Transformation directed by Carol Twigg. Its purpose is to provide expertise and support to those interested in technology integration in higher education. In the fall of 2004, Carol Twigg, Director of the Centre of Academic Transformation, proposed a compelling case for course redesign to an audience composed of many of Alberta's educational leaders.

Funded by the Pew Charitable Trusts, the Center worked with over 30 institutions to redesign their large-enrollment introductory courses to achieve learning gains through the use of e-learning and, given the numbers of students involved, to achieve significant cost savings. In a 2003 EDUCAUSE article where she reviewed the research, Twigg reported that in 20 out of 30 projects, students made substantial gains in their learning. In 10 projects, there was no significant difference. For all 30, reduced costs ranged between 20% and 84%. The six common features of the redesign were:

1. all sections of the course were involved,
2. significantly more active learning was used,
3. part of the course included computer based learning materials,
4. scheduled milestones were utilized to encourage mastery learning,
5. there were more frequent opportunities for individual and small group help for students, and
6. in addition to the instructor, one or more of the following were used: tutors, peers, senior undergraduates, graduate students, and sessional staff.

Over time, NCAT has required partnering institutions to use increasingly robust research methods to evaluate both the educational and fiscal results of course redesign projects. Strategies used to employ e-learning have also become more sophisticated. The outcomes achieved by universities supported by NCAT's current round of funding will provide much needed research data.

In March 2005, the University of Alberta hosted a visit by Carolyn Jarmon who met with several groups on campus and discussed the fundamentals of the Center's approach to course redesign. A recurring theme in these sessions was that simply bolting on technology to existing teaching methods will only result in a fraction of the potential benefits that may be obtained through e-learning.

The Technology Learning and Teaching (TLT) Group

http://www.tltgroup.org/

The TLT Group's Mission is to "motivate and enable institutions and individuals to improve teaching and learning with technology, while helping them cope with continual

change." This non-profit organization has collaborated with over 900 educational institutions, associations, and corporations worldwide to improve learning through the appropriate, sustainable application of communications and information technology.

It is a non-profit institute which provides services to educational institutions seeking to implement technology in their teaching through incremental and cost-effective means. The group's focus is on helping motivate and enable institutions to integrate technology in their teaching while coping with the changes it requires. It provides initial listening sessions and external evaluations to help identify what might be most productive for faculty, shares their experiences through talks and workshops and provides access to specialized tools and guides to assist faculty in making the changes. Begun in 1994, the group has works primarily with its 150+ subscribing institutions, including the University of Alberta.

The award-winning Flashlight Program was developed by TLT Group in 1992. Since then almost 30,000 surveys have been created using the Flashlight Online Web-based service. The Flashlight survey database contains almost 500 validated questions enabling instructors and administrators to easily and inexpensively create, administer, and analyze many types of surveys. Stephen Ehrmann, Director of The Flashlight Program and Vice President, The TLT Group visited the University in March 2005.

The New Jersey Institute of Technology's WebCentre for ALN Learning Networks Effectiveness Research

Sponsored by the Sloan Foundation, this site provides access to research on asynchronous learning networks undertaken under Hiltz, Derry, Goldman, and Turoff. The site contains empirical as well as interpretive and case study research. Their most recent publication, Learning Together Online (2005), includes an integrated research framework which organizes this research and provides both a synthesis of the findings and highlights areas for future research. They note from an analysis of over 20 empirical studies that "*ALN tends to be as effective or more effective than traditional models of course delivery*" (p. xi)

Appendix F: Online Program Support Issues and Priorities

Attracting and satisfying lifelong learners has been identified as a goal by the University of Alberta. Lifelong learners are typically part time students who require the flexibility afforded by online programs. Because of this, online programs represent important opportunities for program growth for the University. Their viability depends on robust e-learning planning and support.

Online programs have a number of common attributes. Although these be may shared with campus-based programs that employ e-learning, online programs are unique in that the teaching learning process is totally reliant on technology. As a result online programs experience the impact of e-learning support more immediately than many of their campus counterparts. Some of the attributes of online programs are described below.

Instruction is enabled by technology
E-learning technologies are mission-critical to online programs where there is little face-to-face contact, if any, among instructors and students. As a result, online programs are highly vulnerable to performance problems with e-learning technologies. A system disruption that might be viewed as a frustrating inconvenience to on-campus users could be experienced as an intolerable disruption by instructors and students in online programs, prompt requests for extensions and may delay program completion.

Technology use is ambitious
Instructors in online programs use technology in sophisticated ways. Whereas an instructor with students on campus may elect to use a limited number of features and tools inWebCT or on other platforms, online instructors will tend to use a more comprehensive set. These instructors often are proactive in investigating emerging technologies as they strive to improve virtual learning environments with their students. For example, online programs have been early, frequent users of synchronous communications technologies.

Given that most or all of the learning activities take place over the Internet, instructors in online programs often work together to develop sophisticated approaches that capitalize on the capabilities of e-learning. Support services must be attuned to the advanced and often complex requirements of this population of users. Online instructors have developed expertise in creating outstanding e-learning environments. The University community would gain by learning from their positive and negative experience.

Online programs are intended to increase access
Part time students value the accessibility of online programs and are demanding learning experiences that provide collaborative, active, problem solving opportunities typically associated with face-to-face learning,. There is a tension between online instructors' desire to use e-learning in sophisticated ways and their need to ensure that the technology does not get in the way of the teaching learning process. E-learning must be implemented in a manner that ensures access even for instructors and students who are less

comfortable with technology or who given their location use a lower bandwidth Internet connection.

The online program and the University is judged by its virtual presence
For most students and many instructors in online programs, the technology mediated presence of the University of Alberta is their primary experience of the University. Students in these programs often pay extra fees to cover the costs inherent in using e-learning. Many lifelong learners are professionals who will withdraw from a program if they do not perceive that they are getting value for their investment of money and time. Furthermore, students and instructors are often employed in organizations or members of professional groups that are sources for future students and instructors. Less than optimal e-learning experiences jeopardize the University's reputation and, ultimately, the long term success of online programs.

Part-time learners have different support needs
Most part-time learners have other commitments at home or in the workplace that limit their ability to access services during standard University hours of operation. The fact that many lifelong learners live in other time zones aggravates the problem. Given their reliance on technology, students and instructors seek to access helpdesk support in the evening or on the weekend especially at the beginning of each term.

On-campus sessions are occasional and intense
A number of online programs have orientation sessions or symposia for the cohorts of learners. These events only occur a few times during a program of study and typically last several days. The condensed curriculum for these events requires significant advanced preparation to ensure that the time is used effectively. Instructors rely on knowing about any changes in e-learning systems well ahead of time. Technology related problems during these sessions can wreck havoc with teaching learning environments these sessions to the extreme frustration of both students and instructors.

The above characteristics of online programs underline the reality that for many online program administrators and the University e-learning is a high stakes enterprise.

Appendix G: E-Learning Resource Questionnaire Results

One of the initiatives within the Office of the Vice Provost (Information Technology) is the formulation of an e-learning plan for the University of Alberta. To assist in the development of the plan, we are asking each faculty to complete the following questionnaire in order to determine the relative priority of e-learning and extent of faculty-based resources dedicated to e-learning support.

E-learning involves the effective use of information technology in supporting the student in learning the material for a course. E-learning aids include but are not limited to: software to present and manage course content and syllabus (e.g., WebCT, Blackboard and others), posting of on-line course material, on-line grade management, on-line quizzes, on-line learning objects to present concepts though active simulations or role playing, on-line discussion groups, on-line chat, web logs, streaming video of relevant material or archived presentations, access to specialized digital content and collections, and general access to the WWW using search tools such as Google.

1. Please indicate your faculty.

   Teaching faculties responding to the survey:
   Agriculture, Forestry and Home Economics
   Arts
   Augustana
   Business
   Education
   Extension

   Law
   Native Studies
   Nursing
   Physical Education and Recreation
   Rehabilitation Medicine
   St. Jean
   St. Joseph's College
   Science

   Other faculties and learning centres responding to the survey:
   Graduate Studies and Research
   Learning Resources (Academic Support Centre)

   Faculties not responding to the survey:
   Engineering
   Medicine and Dentistry
   Pharmacy and Pharmaceutical Sciences

2. Provide the number of FTE (full-time equivalent) support personnel who assist with e-learning activities in your faculty.

Agriculture, Forestry and Home Economics	4
Arts	2.5
Augustana	0.25
Business	2
Education	1
Extension	6
Law	2
Native Studies	0
Nursing	2.5
Physical Education and Recreation	0
Rehabilitation Medicine	0
St. Jean	1.0
St. Joseph's College	0
Science	12

3. Number of FTE instructional and/or curriculum design support:

Agriculture, Forestry and Home Economics	0.5
Arts	1.25
Augustana	0
Business	1
Education	2
Extension	3
Law	1
Native Studies	0
Nursing	1.25
Physical Education and Recreation	0
Rehabilitation Medicine	0
St. Jean	0.0
St. Joseph's College	0
Science	7

4. Estimate how much additional support is needed in your faculty to meet your e-learning needs over the next three years:

Number of additional FTE for technology support:

Agriculture, Forestry and Home Economics	0
Arts	4
Augustana	0.5
Business	0
Education	1
Extension	3
Law	0.5
Native Studies	0.75
Nursing	1.5
Physical Education and Recreation	1
Rehabilitation Medicine	1
St. Jean	1.0
St. Joseph's College	0.25
Science	7

Number of additional FTE for instructional and/or curriculum design support

Agriculture, Forestry and Home Economics	0.5
Arts	2.5
Augustana	1.0
Business	0
Education	2
Extension	3
Law	0.5
Native Studies	0.25
Nursing	1
Physical Education and Recreation	1
Rehabilitation Medicine	1
St. Jean	2.0
St. Joseph's College	0.25
Science	7

5. Estimate the number of FTE students (both undergraduate and graduate) who assist in e-learning activities on a part-time basis or as part of a coop or internship program. (Assume one student working 35 hrs a week for a year is one FTE. Therefore a student working 5 hrs a week for four months would be considered $5/35 * 4/12 = 1/28$ FTE).

Agriculture, Forestry and Home Economics	1
Arts	3
Augustana	0
Business	15

Education	1
Extension	0
Law	0.66
Native Studies	0
Nursing	6/35
Physical Education and Recreation	0.5
Rehabilitation Medicine	0
St. Jean	1.0
St. Joseph's College	0.03
Science	3

6. In your faculty, estimate approximately how much increased e-learning activity you anticipate students will experience on average in their courses over the next three years. For example, if students are generally involved in 4 hours/per week of activity connecting to the course website using associated learning management aids, and you expect this to increase to 7 hours, the increase will be (7-4)/4*100% = 75%. Please check the most appropriate statement.

   2 faculties responded with "0% to 29% increase"
   5 faculties responded with "30% to 59% increase"
   3 faculties responded with "60% to 89% increase"
   4 faculties responded with "90% or more increase"

7. How adequate is e-learning support from the central units on campus (AICT, UTS, TTC, etc.)? Please check the most appropriate statement. If necessary, further comments can be added to the comment box in question 9.

   Technology support:

   4 faculties responded "very inadequate"
   7 faculties responded "inadequate"
   3 faculties responded "about right"
   0 faculties responded "slightly more than required"
   0 faculties responded "significantly more than required"

   Instructional and/or curriculum design:

   6 faculties responded "very inadequate"
   5 faculties responded "inadequate"
   2 faculties responded "about right"
   1 faculty   responded "slightly more than required"
   0 faculties responded "significantly more than required"

8. Does your faculty have a technology or e-learning plan?

   5 faculties responded "yes"
   9 faculties responded "no"

   If not, do you intend to develop a technology or e-learning plan in the coming year?

   10 faculties responded "yes". Note: the Faculty of Nursing responded "yes" to both parts of question 7.

9. Relative to the existing priorities within your faculty, how important is e-learning?

   1 faculty   replied "relatively low priority"
   4 faculties replied "moderately important priority"
   4 faculties replied "important priority"
   5 faculties replied "very high priority"

10. Please provide any further clarification of your answers or any additional comments you would like concerning resources to support e-learning activities on campus.

Appendix H: University of Alberta Libraries' Support for E-learning

The resources of the University of Alberta Libraries comprise one of the major research collections in Canada. University of Alberta Libraries (referred to as The Library) is a member unit of Learning Services. The following is an overview of the services provided by The Library.

Faculty liaisons
Librarians are assigned to work with specific departments and subject areas. In this liaison role, librarians develop and offer a variety of sessions for faculty on best practices for course development when using electronic information resources. These sessions occur in a variety of locations and through different channels depending on what works best for the faculty member. Librarians also provide point-of-need reference and information services for faculty and instructors on a daily basis.

Help-desk support and related services
The Library provides quality support and performance for library related e-learning systems including the library web site, the NEOS Libraries' Catalogue, the Get It link resolver, remote access authentication, and The Library's public access computing infrastructure within the physical library. It provides on-call service support for key library e-learning systems during regular library hours and offers 24/7 access to library resources and services in support of e-learning. As well, The Library provides 24/7 virtual help desk/reference service using online chat. Within the Knowledge Common facility, Library staff and AICT staff assist students with troubleshooting point-of-need problems with using WebCT.

The Library provides specialized services for distance learning. http://www.library.ualberta.ca/distanceeducation/index.cfm The Library is currently working with University Web Services to provide a full range of information under the Online and Distance Learning link on the University website, to facilitate student access to and success in these programs.

Information literacy
The Library's information literacy courses are already embedded within many existing undergraduate and graduate courses, although it is recognized that systematically building these competencies in all learners remains a challenge. Along with faculty, The Library plays a strong role in promoting, teaching and fostering many information literacy skills. On a broader level, the library community, through the American Library Association, has begun to identify information literacy competencies and standards for each discipline.

Since 2004, The Library has been leaders in the evaluation and implementation of a Canadian version of a standardized testing instrument for programmatic level assessment of information literacy skills (Project SAILS) sponsored by the Association of Research

Libraries. Through this work, University librarians are well-positioned to take an active role in developing future information literacy programming.

Digital resources
Learning objects (e.g. electronic articles and journals, e-books, digital collections and initiatives, images, maps and spatial data) already comprise a core library service. The Library's current collection includes 16,500 electronic journals and access to 100,000 electronic books. The Library collaborates with campus partners to provide access to original content developing institutional repositories (e.g. Peel's Prairie Provinces) and e-journals published on campus.

The Library is highly knowledgeable about standards-based practice, metadata creation and material tracking for learning objects. It is well prepared to contribute this expertise to the production, acquisition, integration, and maintenance of learning resources. The Library continues to expand its "Knowledge Common" concept in recognition of the need to develop robust learning spaces where students can access technology such as CD/DVD-burners for file storage with readily available support.

Designing learning spaces
The Library is pleased to be represented on TEISAC and encourages wide consultation in gathering information on campus requirements for technology in the computing labs. Individual libraries support a large number of computing workstations and welcome the opportunity to work collaboratively to provide a more seamless and standardized computing environment to the campus community. The Library encourages increased sensitivity and openness to the diversity of computing choices made by campus users. These choices include everything from desktop and laptop hardware, operating systems, web browser, instant messaging applications, popular mobile devices, social software, and support for languages other than English and French.

Evaluating outcomes
The Library supports evidence-based decision-making, using as one tool an annual survey of student perceptions of The Library. The Library welcomes opportunities to work collaboratively with faculty members on assessing student learning outcomes associated with information literacy instruction.

The Library encourages the development of both formal and informal channels that foster communication with faculty and other e-learning support staff so that there are mechanisms that invite campus-wide discussion or investigation of issues in support of e-learning.

Appendix I: University of Alberta International: International Projects

University of Alberta International: International Projects (UAI:IP) is increasingly using information and communication technologies to integrate e-learning into international development programs. The U of A was the first North American university to become a member of the World Bank Global Development Learning Network (GDLN). Using video-conferencing, web-based learning and knowledge networks, UAI:IP links current research to international capacity building and policy formulation in developing and transitional countries. It is recognized as adopting novel pedagogic techniques to reach professionals in a number of spheres, including government and legal reform, natural resource management and teacher education.

UAI:IP is successfully pioneering innovative e-learning and distance education programs on environmental management with Central Asia, health care with Uganda, governance, legal reform, and faculty development with Bosnia, two-way language-teaching with Japan and teacher education in China. It also is working on building university capacities in developing and transitional countries. These pilot projects provide a base for innovative developments in curriculum and research, as well as scope for funding from international foundations and agencies.