

Teaching, Research, and Discovery Learning: Recommendations for a Great University

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Introduction

The nature of education, of research, and of knowledge itself is being questioned and reshaped to respond to the challenges of our technologically-enhanced and information-based society. To contribute to and advance society, students must graduate from university as highly skilled professionals, exceptional communicators, critical thinkers, and global citizens (Association of American Colleges and Universities, 2002). In response to these challenges and in concert with developments in the scholarship of teaching and learning, universities around the world are exploring more effective, evidence-informed approaches to teaching practice that promote understanding of, skill development in, and application of methods of inquiry to make sense of and advance society.

The University of Alberta has long been engaged with these challenges and is deeply committed to research and creative activities, to teaching, and to student learning. Most recently, the University has been acting on initiatives drawn from the following documents and task forces:

- *Creating a Foundation for an Inquiry-Based Life* (2004), The Working Group on Teaching and Research: Integrating Teaching and Research at the University of Alberta
- *Dare to Discover: A Vision for a Great University* (2006)
- *Dare to Deliver: The University of Alberta Academic Plan 2007-2011* (2006)
- Numerous task forces and reviews relating to teaching, faculty evaluation, and student experiences at department, faculty, and university levels

The University of Alberta is not alone in these endeavors. The University of Alberta is a member of the Carnegie Academy for the Scholarship of Teaching and Learning leadership group on Undergraduate Research. This international group is working on defining the integration of research and teaching (e.g., discovery, methods of inquiry) and investigating institutional approaches to contextualizing these approaches to structuring the learning environment.

In addition to efforts to define and shape the pedagogical practices and values of higher education, Canadian post secondary institutions are under increasing pressure to provide measures of student learning. Measurement often focuses on indirect indices such as student retention, graduation rates, and employer satisfaction (Finnie & Usher, 2005). There is little consensus regarding direct institutional measurements of student learning and even less development of such measures.

The recommendations we present are based on the following activities conducted by the Subcommittee on Research, Teaching, and Discovery Learning of the Committee on the Learning Environment:

- A review of research on integrating teaching and research, inquiry-based learning, and the scholarship of teaching and learning as they relate to discovery learning

- An inventory of existing activities that promote discovery learning at the University of Alberta (Appendix A)
- An inventory of activities related to the integration of discovery learning at peer Universities (Appendix B)
- Consultations with the General Faculties Council Committee on the Learning Environment, the General Faculties Council Academic Planning Committee, the Students' Union, the Graduate Students Association, the Association of Academic Staff University of Alberta, and the Non-Academic Staff Association

Literature Review

Three overlapping literatures

The literature on teaching and research is vast and has a long history. However, the literature can be divided into three overlapping areas, consisting of works on the integration of teaching and research, on inquiry-based teaching and learning and related strategies, and on the scholarship of teaching and learning.

The literature on the integration of research and teaching considers of the role of research universities in higher education and coordinating the two major responsibilities of a university professor (Brew, 2006; Colbeck, 1998; Hattie & Marsh, 1996; Healey & Jenkins, 2009; Jenkins, Breen, Lindsay, & Brew, 2003). Research and teaching, as distinct activities, often come into conflict with each other, in terms of time, resources, and institutional priorities. Approaches to understanding these stresses and integrating the major functions of the university and its faculty members have been variously described as the “teaching-research nexus,” the “integration of teaching and research,” and “research-led teaching,” (Brew, 2006; Griffiths, 2004; Healey & Jenkins, 2009; Jenkins, 2004; Jenkins, et al., 2003; Jenkins & Healey, 2005; Neumann, 1992, 1994). Strategies for teaching that come out of this approach include faculty presenting their research in a classroom context to disseminate the latest research and demonstrate enthusiasm for research and creative works (research-led and research-tutored teaching), teaching methods of inquiry used by the discipline (research-oriented teaching), and guiding students as they develop increasing knowledge and skill at conducting research (research-based teaching; Griffiths, 2004; Healey, 2005; Healey & Jenkins, 2009; Jenkins, et al., 2003). In addition to providing outstanding education experiences for students and developing skills and knowledge that generalize to their employment, an institutional culture that promotes the integration of teaching and research is more collaborative, student-, and community-based (Brew, 2006; Jenkins & Healey, 2005).

Inquiry-based learning has a very long history, dating back to early work by Montessori and Piaget. Inquiry-based learning is often used to refer to similar, but not completely overlapping, concepts of problem-based learning, case-based learning, context-based learning, project-based learning, and discovery learning (Felette, 1993; Lee, 2004). According to these approaches to teaching and learning, students actively construct their own knowledge and acquire new skills, leading to deeper learning and acquisition of critical thinking and communication skills (Barnett, 2005; Kreber, 2001). There is a large body of research examining different components of the inquiry-based or discovery learning environment that can support or detract from learning (e.g.,

Kirschner, Sweller, & Clark, 2006; Mayhew, Wolniak, & Pascarella, 2008; Tuovenin & Sweller, 1999). Inquiry-based learning provides the basis for the undergraduate research movement in the United States (Kinkead, 2003).

Closely allied to both of these approaches to teaching and learning is the scholarship of teaching and learning. Boyer (1990) redefined academic roles to consist of the scholarship of discovery, integration, application, and teaching and reconsidered the university to consist of a community of scholars. The Boyer Commission (1999) made recommendations for transforming research-intensive universities to fit with Boyer's perspective. The recommendations include a guided curriculum that emphasizes inquiry and discovery, providing additional opportunities for undergraduate students to engage in research and service, and changing the faculty reward system to promote the integration of teaching, learning, and research.

Integrating teaching and research, inquiry-based learning, and the scholarship of teaching and learning at the University of Alberta

The vision and academic plan documents, *Dare to Discover* and *Dare to Deliver* provide the University of Alberta with a unique opportunity to draw from these three overlapping literatures to develop learning environments where students learn about the latest discoveries of new knowledge and understanding from faculty who are making these new discoveries, acquire methods of inquiry that help them objectively and critically appraise the world around them, and contribute to new discoveries and creative works in communities of students and faculty.

Accomplishing this vision of creating discovery learning environments that bring together outstanding faculty and students will, in many departments and Faculties, require curriculum reform or revision. According to Wiggins and McTighe's (2005) Backward Design approach to curriculum development, learning outcomes (e.g., the knowledge skills and attitudes the students should have acquired or developed by the end of the course or program) should drive curriculum or course development. The University of Alberta's vision and academic plan provide general outcomes that guide Faculties, departments, and units in developing specific academic visions and plans. From *Dare to Discover* to *Dare to Deliver* to individual self-studies, Backward Design encourages academic units to consider the goals of a university education as a framework for developing specific principles for curricula and courses.

As a practical support for curriculum and course (re)development, Willison (2009; Willison & O'Regan, 2007) has designed the Research Skills Development Framework for designing and assessing courses and curricula. The framework is based on a combination of Bloom's taxonomy of intellectual skill development (Anderson & Krathwohl, 2001; Bloom, Engelhardt, Furst, Hill, & Krathwohl, 1956), research on developing student autonomy to encourage lifelong learning strategies (e.g., Boud, 1988; Fazey & Fazey, 2001), and various strategies for integrating teaching and research (Brew, 2006; Griffiths, 2004; Healy, 2005; Jenkins et al, 2003). According to the Research Skills Development Framework (and consistent with the literature on integrating teaching and research, inquiry-based learning, and the scholarship of teaching and learning), learning ranges from students acquiring knowledge within a highly constrained and guided environment to students discovering or creating new knowledge within an open environment based on self-determined goals.

Although there is a wealth of literature on creating research experiences for undergraduate students, little empirical research has been conducted to evaluate the efficacy of these undergraduate research experiences on student engagement, learning, and satisfaction. The National Survey on Student Engagement and the Faculty Survey of Student Engagement provide items that have been used to assess these experiences at an institutional level (e.g., Ahlfeldt, Mehta, & Sellnow, 2005); Canadian measures include the Canadian University Survey Consortium Survey of Graduating Undergraduates (CUSC). At the course and student level, Lopatto (2003, 2004) has developed the Survey of Undergraduate Research Experiences to assess student perceptions of cognitive, career goal, and research skill gains resulting from undergraduate summer research programs. He has since expanded the Survey of Undergraduate Research Experiences survey into the Classroom Undergraduate Research Experience survey (Lopatto, 2008) for use by instructors and students to assess research skill development based on course objectives as well as student attitudes and learning styles. Course-based surveys such as the Survey of Undergraduate Research Experiences and the Classroom Undergraduate Research Experience survey expand and elaborate institution-wide surveys such as the National Survey on Student Engagement and the Faculty Survey of Student Engagement.

Integrating Teaching, Research, and Discovery Learning

The three literatures of integrating teaching and research, inquiry-based learning, and the scholarship of teaching and research are summarized in Figure 1. The framework for the figure consists of the learning environment, describing how learning opportunities and experiences are organized, and learning outcomes, or the goals of learning. The *learning environment* ranges from instructor-centered, with the focus on the instructor disseminating and assessing student knowledge and understanding to learning-centered, with the focus on the student working within a more or less controlled environment to discover knowledge and understanding that may be new to the student or new to the entire learning community. *Learning outcomes*, based on the revised version of Bloom's taxonomy of cognitive domains of learning (Anderson & Krathwohl, 2001; Bloom, et al., 1956), consist of broad, overlapping categories of learning, and include remembering facts and information, understanding relationships, applying specific procedures, principled analysis and evaluation, and creating new structures, knowledge, and/or creative works.

Within this framework are five themes that integrate the three literatures with the vision and academic plan for the University of Alberta. These themes provide a basis for designing, offering, and evaluating rationally- and empirically-developed curricula that emphasize and make use of the unique opportunities available only at a research- and teaching-intensive university. These themes are disseminating the latest research and creative works even within introductory courses, teaching the methods of each discipline, creating an inquiry-based learning environment that allows students to discover their own understanding, apply their new understanding to solve real-world problems through outreach and community service opportunities, and mentoring students as they discover new knowledge and create new works. Each of these themes is briefly discussed and examples of innovative programs, courses, and activities from the University are presented below. Brief outlines of additional examples from the university of Alberta and peer institutions are found in Appendices A and B, respectively.

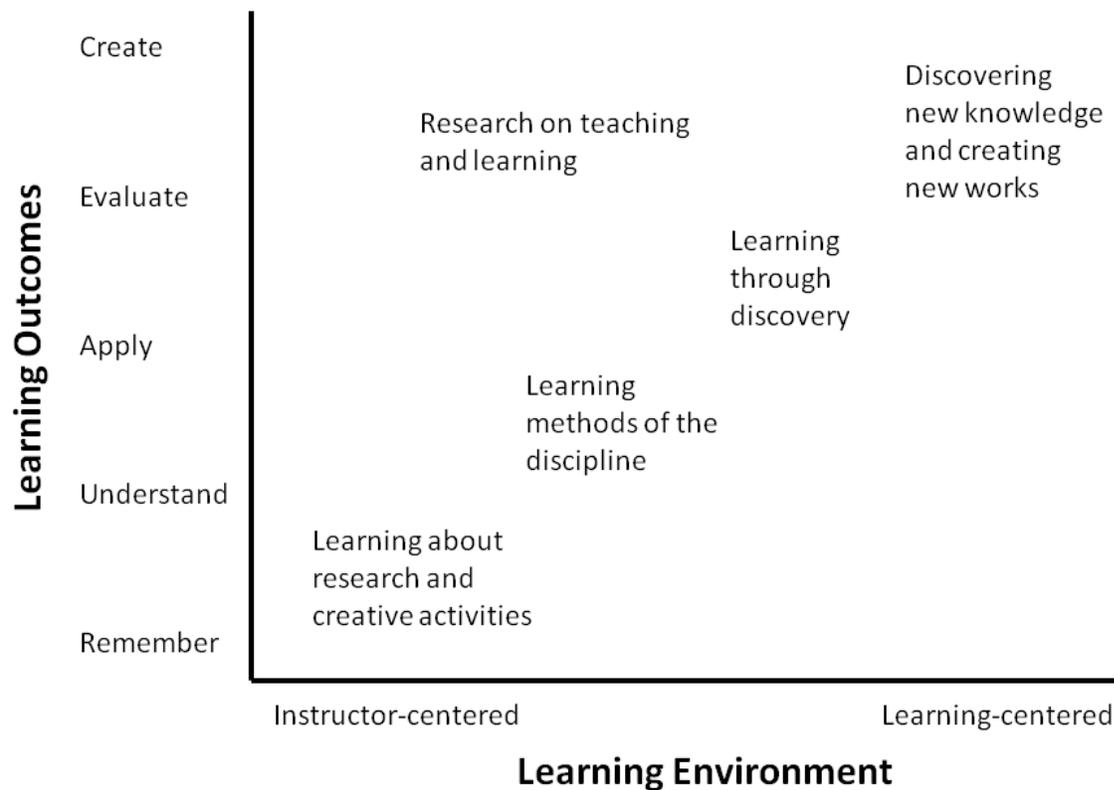


Figure 1. Framework for understanding the integration of teaching, research, and discovery learning.

Learning about the latest research and creative activities

An important benefit of attending a research-intensive university is being exposed to the latest findings and activities of the leaders in discipline. Textbooks, and even primary sources, can be five to seven years out of date due to publication lags. As well, instructors are often more enthusiastic when they teach about their own work and this may motivate students to be interested in the research or creative work and want to learn more about it or contribute to further developments. Survey and early year cornerstone courses that introduce students to leading researchers and academicians and their work add to a vibrant, research-based University of Alberta community. Students in the new animal health science cornerstone course, AN SC 100: Introduction to Animal Health Science, are introduced to a wide range of researchers and professionals working on animal health and disease within a global context. This course helps students decide on their passion in animal health science and develop an understanding of the broader world issues in animal and human health science.

Learning methods of the discipline

Graduates from post secondary institutions are expected to be critical thinkers and able to apply different methods of inquiry to be effective in the workforce and informed citizens. Almost all degree programs at the University of Alberta include courses on methods of inquiry for the disciplines and many programs require these foundational courses for advancement and as prerequisites for research and service opportunities. Some courses not only teach the tools of the discipline, they allow students to apply these tools to solve real-world problems. For example, students in introductory methods courses in Environmental Studies/Geography at Augustana Faculty learn mapping and surveying using Geographic Information Systems and then apply these skills to surveying previously unsurveyed watersheds for Miquelon Lake Provincial Park.

Learning through discovery

Humans are active in their exploration of the world and learning at the lower grades has been long considered to be an active, socially-constructed process. Designing learning environments and experiences to allow students to actively construct their own knowledge and understanding leads to deeper learning and promotes a sense of life-long learning. Science 100: Integrated Science is a *27 course weight first year program and uses discovery learning, creative problem solving, and a highly engaged learning environment to encourage students to think beyond disciplinary boundaries. Although only in a second pilot year, some departments in the Faculty of Science have begun to redesign their traditionally “canned” introductory labs to include more options for discovery learning and exploration.

New discoveries and creative works

In a community of scholars, students and faculty work together to discover new knowledge and create new works. Opportunities available through summer studentships, honors programs, intern and co-operative programs, independent studies courses, capstone course projects, Dean’s research projects, and senior level seminars and service courses provide opportunities for students to contribute to the advancement of scholarship of discovery, integration, and application. In DRAMA 407/507, students write and produce a theatrical performance with a community theatre group. This unique capstone course allows students to integrate and reflect on their prior learning as they create a public performance. Students shouldn’t have to wait for a capstone course to learn and apply important skills and knowledge however. Some departments in the Faculty of Science offer credit/no credit research opportunity courses (e.g. CHEM 299, BIOL 299). Based on the success of these courses, the Collective Body of Arts Students (CBAS) recently contacted the Associate Dean of Arts to initiate discussion on developing relevant Faculty of Arts 299 opportunities.

Research on teaching and learning

Most disciplines have journals devoted to research on teaching and learning (e.g., *Journal Chemical Education*, *Journal of Engineering Education*, *Teaching Psychology*) and greater emphasis is being placed on evidence-based teaching and learning. The Teaching and Learning Enhancement Fund and McCalla Professorships and, to some extent, the Vargo Teaching Chairs,

support research on teaching and learning at the University of Alberta. More importantly, some Faculty Evaluation Committees recognize publications and presentations related to the scholarship of teaching and learning as valid contributions to the advancement of knowledge. The Faculty of Nursing not only recognizes the importance of scholarly reflection and research on teaching and learning but has developed an annual, peer reviewed conference on the scholarship of teaching and learning, *Through the Looking Glass: Reflecting on the Scholarship of Teaching/Learning*, to encourage and celebrate scholarship of teaching and learning.

Recommendations

Based on the review of the literature, identification of themes representing the integration of teaching and research, and inventories of opportunities at the University of Alberta and peer institutions, the Subcommittee on Research, Teaching, and Discovery Learning of the Committee on the Learning Environment makes the following recommendations regarding research, teaching, and discovery learning at the University of Alberta to support *Dare to Discover* and *Dare to Deliver*. Recognizing the importance of being accountable for our recommendations, we also include indications of successful implementation of our recommendations.

- 1. *Provide experiences for students at all levels of undergraduate classes to be exposed to and experience new discoveries and creative activities.***
 - a. *Encourage and support teaching by senior faculty and outstanding researchers in introductory courses.***

Most tenure-track faculty must teach at least a portion of one course per year. Many of our top researchers and artists are in the classroom but often at the senior and graduate level. We recommend that students in lower level introductory and survey classes be exposed to the leading and innovative scholars in our great university. Examples of how beginning students may be exposed to outstanding research and researchers include encouraging top researchers (who may be faculty, research professors, post doctoral students, or graduate students) who enjoy teaching to teach at least a portion of a lower level course, developing formal and informal seminars and lecture series designed specifically for beginning undergraduates, and inviting guest speakers into classes to discuss their work. We also recommend that these international scholars and researchers, post doctoral fellows, and graduate students should not merely be offered to students as figureheads; we recommend that they should actively demonstrate how research and creative works in the disciplines are carried out.

Indications of successful implementation of this recommendation include increased percentages of introductory courses taught by senior faculty; increased numbers of guest lectures by researchers (including research professors, post doctoral fellows, and graduate students); improved results on measures of student satisfaction on Faculty and departmental surveys; and improved first year student results on target Academic Challenge and Quality of Relationship NSSE items.

b. *Create cornerstone and capstone courses in all programs.*

To promote student engagement in their academic programs, we also recommend greater offering of cornerstone and capstone courses. Cornerstone courses, taken during the first year, introduce students to the discipline, provide a foundation for future courses and develop a sense of excitement about the discipline that may lead to greater student retention. Capstone courses, taken toward the end of a student's program, allow students to integrate, evaluate, and apply their undergraduate learning and experiences.

Indications of successful implementation of this recommendation include increased numbers of cornerstone and capstone courses; increased retention and graduation rates; improved results on measures of student satisfaction on Faculty and departmental surveys; improved results on target Academic Challenge, Academic and Intellectual Experience, and Enriching Educational Experiences NSSE items; and improved results on target CUSC items.

2. *Provide more opportunities for students to contribute to new discoveries and creative works.*

a. *Extend student research assistantships.*

Summer research assistantship opportunities are available through the NSERC undergraduate summer research awards program. The Vice-President (Research) Office established the Roger Smith Undergraduate Summer Research Award program, co-sponsored with certain Faculties, to provide analogous opportunities for students in disciplines funded by SSHRC. Both programs give undergraduates an opportunity to contribute to research and scholarship activities, often in collaboration with graduate students and postdoctoral students.

The Vice-President (Research) Office is committed to providing matching funds to faculties that wish to increase the number of research assistantships they award each year. The monetary compensation for research assistantships can rarely be made competitive with employment opportunities outside the university. However, we recommend that the value of these awards be reexamined to ensure that students selecting a research experience are minimizing their financial cost.

We also recommend that the Vice-President (Research) Office and Faculties allow students to hold a Roger Smith awards during any 4-month period, not just during the summer time period. Faculty in many disciplines conduct extended off-campus research work in the summer and it may be more viable for them to supervise undergraduate research interns and integrate them into their projects during the academic year. Students as well may find it more financially sensible to accept research-related opportunities during the academic year, rather than during the summer.

Indications of successful implementation of this recommendation include increased numbers of students applying for and engaging in undergraduate research experiences; increased

retention and graduation rates; increased numbers of students applying for and entering post graduate and professional programs; improved results on target Academic Challenge, Academic and Intellectual Experience, and Enriching Educational Experiences NSSE items; and improved results on target CUSC items.

b. *Develop and support course-based research opportunities.*

Not all students are eligible or able to participate in full-term research assistantships, honors programs, and other opportunities to participate in a community of scholars. Class-based research opportunities, within capstone courses or other senior level courses, allow a larger selection of students to access opportunities to make new discoveries. These opportunities are, however, sometimes hindered by difficulties with aligning such projects to current research ethics regimes. Some Human Research Ethics Boards, such as the current Education, Extension, Augustana, St Jean HREB, have simplified procedures for designing and obtaining ethical approval for course-based research. As the HREBs consolidate, we recommend the development of streamlined methods for obtaining approval for course-based discovery and applied research for all HREBs.

Indications of successful implementation of this recommendation include streamlined and aligned procedures for obtaining ethics approval for course-based research by all HREBs; a better understanding of and compliance with human research ethics by instructors developing course-based research assignments; at least one course-based research opportunity within each degree program; and improved results on target Academic Challenge, Academic and Intellectual Experience, and Enriching Educational Experiences NSSE items; and improved results on target CUSC items.

c. *Coordinate opportunities: Office of Undergraduate Research.*

We support the Students' Union (University of Alberta Students' Union, 2009) request to create an Office of Undergraduate Research. The purpose of this Office would be to support undergraduate students as they develop discipline-specific and interdisciplinary research skills and attitudes that prove useful for employment, research, and service in the community.

The Office would coordinate formal and informal research opportunities for students; assist in disseminating results of research through undergraduate research journal publications, conferences, poster sessions, and media releases; and coordinate activities and opportunities available in different Faculties. Coordination would be accomplished through the development of an online repository of interests, opportunities, and events to help students, faculty, and community members connect regarding shared interests, ideas, or questions. This repository could accompany or be modeled along the lines of the proposed CAPS: Your U of A Career Centre Career Discovery Through Engagement programs and/or the proposed Whatsoever Things are Student portal to student services, resources, and activities. The Office of Undergraduate Research could accomplish many of the recommendations we make here, most particularly, 2a and 3a.

Indications of successful implementation of this recommendation include increased opportunities for students to experience or be exposed to research; increased numbers of students engaging in undergraduate research; improved student retention in targeted Faculties; increased numbers of students applying for and entering post graduate and professional schools; and improved results on target Academic Challenge, Academic and Intellectual Experience, and Enriching Educational Experiences NSSE items; and improved results on target CUSC items.

3. *Strengthen environments supporting faculty and students in teaching, research, and discovery learning.*

The University of Alberta's vision, mission, and academic plan demonstrate a commitment to teaching, research, and discovery learning. To achieve this vision, we need to promote and strengthen the teaching and learning environment and encourage collaboration among different groups.

a. *Celebrate innovation.*

The Festival of Teaching 2008 and 2009 were successful in promoting innovation in teaching and learning. Building on the success of the Festival of Teaching, we recommend wider promotion through such outreach activities as displays at Enterprise Square; Posters at the Legislature; Lunch and Learn at the Stanley Milner Library; research posters at Open House; talks at Teachers' Conventions; regular features in the print, television, and radio media; and development of an undergraduate research journal with the Libraries. We also need greater promotion through the University of Alberta Web site, including circulating through a greater variety of articles and photographs on the home page, and greater prominence of opportunities and activities. The University of Alberta Research Site (<http://www.research.ualberta.ca/>) includes a section for undergraduate research. The recommended Office of Undergraduate Research would start with this section to disseminate, celebrate, and promote events and opportunities for that enhance discovery learning and the student experience.

Indications of successful implementation of this recommendation include increased media exposure; participation by instructors, researchers, students, and the community in events such as Posters at the Leg; increased numbers of students and faculty engaging in collaborative projects; increased publications of student research; improved results on target Enriching Educational Experiences NSSE items; and improved results on target CUSC items.

b. *Support Faculties, departments, and instructors in course and curriculum reform for discovery learning.*

Many departments are working on course and curriculum (re)design, and others will need to engage in this process to address components of *Dare to Deliver*. Some Faculties have a teaching and learning committee and some departments have an undergraduate curriculum committee.

We recommend that, working within the integrated-distributed model for support and services, the University of Alberta support instructors and departments as they engage in course and curriculum reform/revision to encourage increasing levels of student autonomy and discovery learning in response to *Dare to Deliver*. This support must extend beyond the limited Teaching and Learning Enhancement Fund. The exact nature and extent of this support will depend on interrelationships between department committees, Faculty committees, and central units such as the Centre for Teaching and Learning (CTL; formerly University Teaching Services and eLearning) and Learning Solutions.

CTL, as an evidence-based educational and technological development and support unit, is uniquely qualified and situated to provide leadership and guidance in curriculum reform (cf. Kreber, 2006). Many resources are available for curriculum (re)design and development, including Wiggins and McTighe's (2005) Backward Design and Willison's (2009; Willison & O'Regan, 2007) Research Skill Development Framework. We recommend that CTL and Learning Solutions be engaged by Faculties, departments, and individual instructors as they engage in curriculum and course (re)design, (re)development, and program evaluation.

The Teaching and Learning Enhancement Fund, McCalla Professorships, and Vargo Teaching Chairs mostly reward individual instructors as they develop and evaluate innovative environments and experiences. Although most of the awards are laudable, many are one-offs, with little potential for scaling beyond a single class or experience. We recommend that the terms of reference for these awards be revised to emphasize collaboration among instructors, departments, and Faculties as they develop and institute the curriculum reforms recommended above. This includes providing short-term and ongoing funding through a revised TLEF as instructors and departments/Faculties reorganize and develop courses, offer innovative courses and discovery learning opportunities, and providing continuing professional development through CTL and revised Vargo Teaching Chairs as faculty adjust to different approaches to teaching, learning, and research.

Indications of successful implementation of this recommendation include increased numbers of program and curriculum-based TLEF applications; effective Vargo and McCalla award recipients and results; curriculum (re)design consistent with the vision and academic plan; increased scholarship of teaching and learning by faculty, researchers, post doctoral fellows and graduate students; and improved results on targeted NSSE and CUSC survey items.

c. *Recognize the scholarship of teaching, research, and discovery learning at FEC and across the university.*

Finally, some Faculty Evaluation Committees recognize the scholarship of teaching and learning as scholarly, "above the line," activities. Other Faculties relegate such activities and accomplishments to teaching or "below the line" activities. We recommend discussion of FEC criteria at Deans Council with the goal of developing equitable options for encouraging and recognizing discovery learning, community service learning, and the integration of research and teaching in all Faculties. This includes development of policies and procedures that allow and recognize opportunities for course and curriculum (re)development.

The Practice Subcommittee of the Teaching Learning and Technology Council (Bohun, Campbell, Robinson, May 9, 2007) developed performance indicators for faculty engaging in enhanced teaching and learning. These indicators are shown in Appendix C. A number of these measures, along with empirically validated measures such as the Classroom Undergraduate Research Experience survey (Lopatto, 2008) could be modified and used in conjunction with student surveys to provide a selected assessment of the effect of discovery learning experiences on student attitudes and learning, and on faculty attitudes and productivity. These more direct measures could then become part of the “report card” accompanying *Dare to Deliver*.

Indications of successful implementation of this recommendation include changes to FEC documents in different Faculties recognizing scholarship of teaching and learning as an important research endeavor; increased publications and presentation by faculty, post doctoral fellows, and graduate students on the scholarship of teaching and learning; increased student satisfaction on department and Faculty surveys; improved results on targeted NSSE and CUSC items.

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Appendix A

Campus Inventory of Activities and Opportunities for Discovery Learning 2006-2008

Introduction

In 2004 and 2006, the University of Alberta collected submissions from all units detailing their respective contributions to the University's various communities of practice. The 2004 submissions reflected Faculty- and School-level initiatives and aspirations related specifically to integrating teaching and research and can be found in the appendices of *Integrating Teaching and Research at the University of Alberta: Creating a Foundation for an Inquiry-Based Life*. The 2006 submissions were used to generate the University Academic Plan; themes emerging from them are reflected and built upon in *Dare to Deliver*.

Rather than requesting that faculties and units generate a new submission to this report, the subcommittee compiled examples from existing documents that reflect activities that relate to the themes highlighted in this report. This compilation was conducted in consultation with relevant stakeholders June-December, 2008. This document is *by no means* a complete account of every activity undertaken by every faculty relating to the themes. It is merely meant to highlight some of the work already being done by Faculties that support the themes and recommendations identified in this report.

Common Themes

Across all of campuses, all units have demonstrated commitment to many common aspirations and activities that positively contribute to the discovery, dissemination and application of new knowledge through teaching and learning, research and creative activity, community involvement and partnerships. Though each unit has a unique approach developed within their own respective histories and disciplines, all share a laudable commitment to excellence in teaching, research, and encouraging engagement within and across faculty and disciplinary boundaries.

Stimulating public conversations about activities and achievements relating to teaching, research and creative activity

In *Integrating Teaching and Research at the University of Alberta: Creating a Foundation for an Inquiry-Based Life*, Faculties and Schools offered extensive examples of initiatives designed to disseminate the results of faculty, staff and student projects and initiatives to both internal and external audiences. A perusal of faculty websites revealed additional opportunities for faculties to showcase their achievements and for people to come together and collaborate in a wide variety of communities of practice.

Each Faculty and School has a space on their Web site devoted to news and events. News items are often about the achievements of faculty, staff and students in research, in learning, and in community outreach. In addition to their online presence, Faculties also offer a wide array of

workshops, forums, exhibitions, symposia, colloquia, poster presentations, performances, and other public showcases of their activities. Most Faculties also host disciplinary conferences that may be geared to serve faculty, staff, students or wider communities. Many of these conferences are hosted by departments, Faculties or central units; however, some are also hosted in conjunction with partners external to the university or by student-run organizations.

Supporting Engaging Approaches to Learning

Though the approaches to student engagement are deeply discipline-specific, a commitment to cultivating active, engaged citizens through excellent undergraduate, graduate and lifelong learning programs is a fundamental part of every faculty's activities.

Many, if not all of the Faculties and Schools offer one or more of the following opportunities to their students:

- Capstone and Cornerstone courses
- Honours and Specialization programs
- Co-curricular or extra-curricular research projects, often as part of an Honours or Specialization program
- Applied learning opportunities such as information technology literacy or English as a Second Language training

In addition to these program offerings, many faculties have embraced entire curricular frameworks that integrate strategies to encourage active learning within their specific contexts. Be it in the form of the Faculty of Nursing's longstanding commitment to context-based learning, the Faculty of Medicine and Dentistry's use of inquiry-based learning, the moots, case competitions and building projects offered by Law, Business, and Engineering, or the adoption of problem-based learning by various departments and instructors across campus, most faculties strive to incorporate such opportunities into their course offerings wherever feasible.

Many Faculties also offer scholarships and awards to students that serve to recognize outstanding achievement and improve student access to learning opportunities.

Supporting Experiential Learning and Professional Development

Without exception, every faculty and school on campus is committed to offering students opportunities to experience the practice and research of their discipline and, where appropriate, to access professional development opportunities. Though the specific nature of these opportunities is distinctively tailored to the needs, priorities and resources available to each individual faculty, they commonly manifest as one or more of the following program offerings:

- summer student research assistantships
- field schools
- co-operative placements or internship programs
- practicum placements
- international exchanges
- opportunities to be instructed by practicing professionals
- educational seminars by faculty or guest lecturers

- formal and informal mentoring (peer to peer, graduate to undergraduate, faculty to graduate, senior to junior)

Depending on the structures best suited to specific programs, these opportunities may be co-curricular, extracurricular or even post-degree. Faculties offer a wide array of undergraduate, graduate and/or lifelong learning opportunities.

Recognizing and supporting faculty excellence

The work that faculty members do is integral to the proper functioning of the University. Each faculty devotes extensive resources to supporting those activities and to recognizing excellence. Be it through showcases of faculty achievement, providing support for award applications, accommodating challenges specific to the disciplines of the faculty or the attention paid to ensuring fair and constructive evaluation, all of our Faculties exhibit impressive dedication in this area.

Embracing Interdisciplinarity

The University of Alberta prides itself in its commitment to promoting interdisciplinary partnerships. Each of its faculties has developed a unique approach to promoting interdisciplinary learning, discovery and creative activity that reflects the needs and aspirations of their diverse communities. Many undergraduate courses and programs are explicitly interdisciplinary, as are many research centers and institutes dotting our campuses. Staff and students alike engage in interdisciplinary activities every day.

Encouraging External Partnerships

Much of the work that the University does is firmly rooted in the communities it serves. Students and staff alike benefit from partnerships with external organizations.

Such partnerships often take the form of the following:

- Co-operative programs, international exchanges, summer research assistantships
- Professional development training and continuing education for community partners
- Funding initiatives (both ongoing and for specific events or programs)
- Centers & institutes
- Community-based research and Community Service Learning.

There are many other examples of faculty activities that span these themes. Some of these are listed below under the specific faculty.

Unit Specific Highlights

Faculty of Agriculture, Life and Environmental Sciences

- Faculty Members
 - Recognition of teaching award winners on the “Wall of Teaching”
 - Name change that more accurately reflects the work/research that faculty do
- Graduate Students
 - Encouraging and mentoring graduate students in both their studies and their teaching through partnerships with the Faculty of Graduate Studies and University Teaching Services
- Undergraduate Students
 - Aspires to ensure that every student has an experiential learning opportunity
 - Robust co-op and internship programs
 - Community Service Learning
 - Use of “real world” problems in classroom learning
 - Demonstrated commitment to capstone courses
 - Pairing research with community involvement (Heifer in Your Tank/Animal Science 200)
 - Cohort with a capstone course
 - Interest in developing cornerstone courses to enhance student learning opportunities in the early years of their degrees.
 - Development of an honors program
 - International exchanges
- Other Projects
 - Agri-Food Discovery Place
 - WISEST connects leading-edge research in the life and environmental sciences to local high schools and prospective students

Faculty of Arts

- Faculty Members
 - Supporting staff and faculty excellence
 - The slideshow that accompanies the annual “State of the Faculty” address highlights landmark achievements of the faculty as a whole, including successes of faculty, staff and students.
- Graduate Students
 - Encouraging and mentoring graduate students in both their studies and their teaching through partnerships with the Faculty of Graduate Studies and University Teaching Services
 - Currently undergoing unit review across the faculty
 - Developing interdisciplinary course-based MA
 - Developing community-based MA to engage rural and aboriginal communities

- Undergraduate Students
 - Emphasis on discovery learning, community service learning, integrating teaching and research within and across the disciplines
 - Office of Community Service Learning (CSL)
 - Roger S. Smith Undergraduate Researcher Award
 - Awards of \$5,000 granted to undergraduates to conduct 15 weeks of faculty-supervised research over the summer
 - Emphasis on increased opportunities for students to access experiential learning opportunities in of field work placements, internships, international exchanges, etc.
 - Ghana partnership
 - course-based Human Geography field school
 - The Collective Body for Arts Students (CBAS), established in Spring 2007, is a notable example of Arts students synthesizing and applying their university experiences.

- Other Projects
 - Supports a number of community-based learning opportunities
 - GeriActors drama troupe
 - Alberta Suzuki String Institute
 - Commitment to improving informal and formal learning spaces in the faculty
 - funding renovations to student lounges
 - Faculty dialogues/showcases
 - Critical Dialogues series, Arts Week '08
 - Work of Arts magazine profiles faculty activities and alumni
 - Office of Interdisciplinary Studies houses a number of interdisciplinary programs (both graduate and undergraduate)

Augustana Campus

- Faculty Members
 - Rural research network coordinated through the Alberta Centre for Sustainable Rural Communities (in conjunction with the faculty of Agriculture, Life and Environmental Sciences)

- Undergraduate Students
 - Increase opportunities for wilderness experience, cross-cultural experiences, practica, internships, international support
 - Combining/promoting service learning and international exchange opportunities
 - Roger S. Smith Undergraduate Summer Research Awards and Augustana Summer Student Research Assistantships
 - Developing inquiry-based capstone courses
 - Supporting student conferences

- Other Projects
 - Each year (beginning in 2006), a committee of faculty and students selects a topic of current interest and enduring significance, and invites guest speakers, faculty members, and students to study the issues associated with the theme for that year and to engage in dialogue and debate regarding its implications and consequences. 2007/08's theme was "*Boom and Bust.*"

School of Business

- Faculty Members
 - 13 applied research centres, including the Centre for Technology Commercialization, Canadian Institute of Retailing, Centre for Entrepreneurship and Family Enterprise and Services and the Centre for Public Management.
- Graduate Students
 - MBA Internship
 - National and international placements
- Undergraduate Students
 - Works closely with AACSB to assess undergraduate curriculum and learning outcomes
 - The U of A School of Business was the first School to be accredited by the AACSB and has held accredited status longer than any other Canadian Business school.
 - International summer internships
 - Co-op program
 - Interdisciplinary programs
 - Demonstrated commitment to increasing the number and diversity of international exchange opportunities for students in both undergraduate and graduate programs.
 - Experiential learning – case competitions for graduate (MBA) and undergraduate programs.
 - Opportunities for students to network and compete, to showcase their achievements and to raise the profile of the University of Alberta.
 - 19 affiliated student groups, including four MBA-level organizations.
- Other Projects
 - Hosts a number of outreach lectures, guest lectures and presentations by local business leaders;
 - The Canadian Business Leader Award (CBLA) is presented annually at a celebration hosted by the School to recognize an outstanding business leader

Faculty of Education

- Faculty Members
 - Scholarship of teaching and learning frames disciplinary research
 - Professional development on culture and diversity

- Leading a collaboration on Global Citizenship Curriculum
- Partnerships with elementary and secondary schools as well as other centers of learning with emphasis on pedagogy
- Specialist Faculty Technology council and a specialist technology professional development unit
- Graduate Students
 - Graduate program in collaboration with Faculty of Medicine and Dentistry
 - Education Clinic- graduate students in Education Psychology provide supervised counseling, assessment, reading and language services to clientele who cannot access such services for financial or other reasons
- Undergraduate Students
 - Internships/field experiences in schools across Alberta
 - Roger Smith undergraduate research program
 - Opportunity to participate in specialist institutes on culture and diversity
 - Interfaculty programs with joint degrees in science, human ecology, music and PE
 - Off-campus collaborative programs with Red Deer College, Grande Prairie Regional College, Keyano College, Medicine Hat College
 - Aboriginal Teacher Education Program – collaborative with Northern Lakes College, Blue Quills First Nation College and Maskwachees Cultural College.
 - International field experiences in Macau
 - Global Citizenship Field Experience in Ghana
- Other Projects
 - Supports the Education Students' Association's annual Education Week
 - The Kangwon-do Teacher Education Program has been operating annually since 1984 and functions as a collaborative initiative between the Alberta Education, the Department of Secondary Education at the University of Alberta, and the Kangwon-Do Board of Education

Faculty of Engineering

- Faculty Members
 - Successful in attracting post doctoral fellows, researchers, and visiting faculty
 - Commitment to celebrate achievements and foster collaboration between faculty and between the faculty and other partners
 - Emphasis on knowledge translation
- Graduate Students
 - Continuing success in recruiting outstanding grad students
 - Dynamic, discovery-based learning environment
 - Masters program internships
 - Continuing education courses

- Undergraduate Students
 - Work with accrediting body to assess undergraduate curriculum and professionalization of undergraduates
 - Dynamic, discovery-based learning environment
 - Partner with colleges
 - All final year students complete major final year design project in group setting the integrates learning discovery
 - International design competitions
 - Exposure to engineering research
 - Dean's Research Award program
 - Robust co-operative programs
 - Cohorts
 - Curricular emphasis on ethics, social responsibility, environmental stewardship
 - Extracurricular experiences, including a large community of Engineering clubs and related student groups

- Other Projects
 - Commitment to improved partnerships with stakeholders in the community/increasing the profile of the faculty
 - WISEST and DiscoverE connect Engineering faculty and students to local high schools and prospective students
 - Outreach activities through the Association of Professional Engineers, Geologists, and Geophysicists of Alberta (APEGGA)

Faculty of Extension

- Faculty Members
 - Develop and evaluate innovative/flexible models of program design and delivery (including at a distance)
 - Mentoring program with UTS and Staff Learning and Development

- Graduate Students
 - Professional, interdisciplinary programs
 - Masters degree in continuing professional development

- Undergraduate Students
 - Articulation and credit status courses

- Other Projects
 - The move to Enterprise Square is increasing opportunities to offer lifelong learning opportunities and professional development opportunities to local businesses

Faculty of Graduate Studies and Research

- Improved access and funding
- Research Profile Project
- Integration of Teaching and Research Week
- Training in supervision and mentoring
- University Teaching Program
- Graduate certificate in community research methods
- Professional Science Masters degree

Faculty of Law

- Graduate Students
 - New PhD program will give graduate students opportunities to enrich the research program of faculty
 - Strengthening the LLM
 - The faculty holds professional development seminars, encouraging graduate students to...
- Undergraduate Students
 - International exchanges
 - Indigenous and international awareness
 - Summer internships in Northern Canada
 - Competitive moot courses give students the opportunity to engage in experiential professional training
- Other Projects
 - Through work with Student Legal Services (SLS) students are able to engage in experiential learning opportunities while enabling members of the community to access basic legal services pro bono

Faculty of Medicine and Dentistry

- Faculty Members
 - Division of Continuous Professional Learning
 - Amending the expectations of the faculty evaluation process to better encourage discovery learning and innovations in the area of facilitating discovery learning
- Graduate Students
 - Mentoring
 - MedStar publishing awards
 - Leading-edge graduate programs
 - Clinical psych program (Health Psychology)
 - First school of podiatry in Canada
 - Health Informatics

- Masters in Medical Education
- Masters in Dental Hygiene
- Masters in Pathology Assisting
- Division of Analytical Environmental Toxicology

- Undergraduate Students
 - Firm commitment to adoption of inquiry-based learning
 - Working closely with accrediting body to assess and improve undergraduate curriculum
 - One of the largest summer student research programs in Canada
 - Commitment to student-led community outreach
 - 2005 Student-organized and run inner-city research opportunities (SHINE)
 - Other community service opportunities include the Butt Out, Safe Sex, Skin Cancer Prevention outreach programs
 - Interdisciplinary programs in collaboration with Arts, Science, Education
 - Student summer research opportunities – Special Training in Research Certificate
 - Elective program in traditional healing
 - Budget line for laboratory teaching, research techniques

- Other Projects
 - WISEST & HYRS connect leading-edge research in the health sciences to local high schools and prospective students
 - New buildings (Discovery Centre, Edmonton clinic) set to revolutionize faculty's ability to engage in cutting-edge research and providing state of the art facilities for inquiry-based learning

Faculty of Native Studies

- Graduate Students
 - Developing a Masters in Native Studies

- Undergraduate Students
 - Community-driven research teams (e.g., Métis Archival Project, Historical and Legal Foundations of Métis Aboriginal Rights in Alberta, Cree Language Education, etc.)
 - Urban and civic engagement with Aboriginal youth
 - Interdisciplinary programs with Faculty of Physical Education and Recreation in Aboriginal Recreation, Sport, and Tourism

- Other Projects
 - Performing arts

Faculty of Nursing

- Faculty Members
 - Joint appointments with clinical care providers that provide faculty members with clinical practice opportunities
 - Awards Nomination Committee that identifies potential award recipients and supports them in the nomination process
 - Exploring the potential of Research, Teaching and Citizenship groups that integrate research, teaching and citizenship providing a focus for mentorship, development of course materials based on emerging science, collaboration with interdisciplinary research groups, policy-makers and health care organizations
 - Interdisciplinary Institute of Qualitative Methodology

- Graduate Students
 - Newly revised Master's program in Advanced Practice Nursing implemented in September 2008
 - Master of Nursing includes 700 hours of practicum experience
 - Doctoral and post doctoral scholars in residence from partner universities in Brazil, Thailand and Ghana study at the University of Alberta for periods of 4-9 months strengthening research training and providing cross-cultural learning opportunities for University of Alberta graduate students and faculty alike
 - Partnership with Capital Health to provide a bursary to Master's students to study full time and accelerate progression through the program. Upon graduation students assume a joint clinical/academic position with FON and Capital Health

- Undergraduate Students
 - Honors Program that provides undergraduate students with opportunities to gain in-depth knowledge in areas of research and for mentorship
 - Adopted a Context-Based Learning (CBL) curricular approach in 1997 and is one of the pioneers in the delivery of CBL in health education programs
 - Researchers and clinical experts deliver guest lectures on applied research in undergraduate CBL courses as "Fixed Resource Sessions"
 - Development and financial support for additional Health Professional Student Research Awards which provide summer research training opportunities for undergraduate students
 - Inclusion of clinical nursing experience in every year of the undergraduate curriculum in health care settings that provide students with rich and diverse nursing practice experience
 - Opportunities for international experience through clinical practica, e.g., Ghana, USA Australia, Peru, Brazil and Hong Kong
 - Paid internships for undergraduate students after Year 3 in collaboration with Capital Health and Caritas which substitutes for required clinical course work
 - Community service integrated into undergraduate curriculum; e.g., serving lunch at Boyle Street Community Services Co-operative, participating in the annual influenza immunization campaign

- Other
 - World Health Organization Collaborating Centre

- Annual Margaret Scott Wright Research Day
- Innovative model of clinical education called a Clinical Learning Unit being implemented in collaboration with the Royal Alexandra Hospital which is expected to accelerate the introduction of innovation into teaching and clinical practice through enhanced integration of research, teaching and clinical practice
- Participation in Health Sciences Education and Research Commons and development of Edmonton Clinic

Faculty of Pharmacy and Pharmaceutical Studies

- Faculty Members
 - Pharmacy practice-based research – transition research knowledge into practice
- Graduate Students
 - Pharmacy-specialized MBA
- Undergraduate Students
 - Improve undergraduate student/research trainee ration
 - Outcomes based BSc Pharmacy, using student-centred, active learning pedagogical approach
 - Service learning, Toastmasters, 50 hours of service learning
 - PharmD program for practitioners (modeled after US)
 - Interdisciplinary Student Team Assessment and Review Therapy Clinics (START)

Faculty of Physical Education and Research

- Faculty Members
 - Institute for Physical Activity and Health
 - International Coaching Schools certificate programs
- Graduate Students
 - Work to enhance funding
- Undergraduate Students
 - Joint degree in Aboriginal Recreation, Sport, and Tourism with School of Native Studies
 - Research practica, international exchanges, community service learning opportunities
 - Co-op placements, summer camp placements
 - Student learning enhancement fund

Faculty of Rehabilitation Medicine

All professional entry programs have become graduate-level. The last cohort of undergraduate students in the faculty graduated from the Occupational Therapy program in 2008.

- Faculty Members
 - Develop improved clinical relationships with rural & urban health facilities outside the Edmonton area
 - Playing a primary role in development of the Alberta Rehabilitation Network
 - Faculty teaching awards for clinical & tenure track staff, "teaching wall", & innovative teaching committee to support exceptional teaching staff
 - Teaching Continuing Care Centre – community-based setting
 - Interdisciplinary certificates in Pain, Stroke, Diagnostic Imaging, Bariatrics
 - Disciplinary certificates in Manual Therapy, Francophone Speech and Language Pathology
 - Interdisciplinary research groups
- Graduate Students
 - Expand size of the programs based on needs assessments
 - Further develop new MSc and PhD in Rehabilitation Science
 - Student clinics in Physical Therapy and Speech and Language Pathology
- Other Projects
 - Working towards a repurposed Corbett Hall that will enhance learning and discovery
 - Bridging certificate program for Bachelors trained clinicians in physical therapy who wish to have a Masters degree for practice

Campus Saint-Jean

- Faculty Members
 - Continue to develop Canadian Studies Institute
 - Community development, host conferences
 - Change FEC to promote personal and professional growth
 - Create French Language school
- Graduate Students
 - Expand Canadian Studies Institute
- Undergraduate Students
 - Core competencies model of teaching and learning – students will minimally develop knowledge, skills, and attitudes to required to conduct valid research
 - Workplace experience, community action opportunities, students work at conferences
 - Bachelor of Commerce co-operative program

- Interactions with other programs, e.g. Peace and Post-Conflict Resolution Program
- Other Projects
 - Many partnerships and events with the local francophone community

Faculty of Science

- Faculty Members
 - Specific sessions on mentoring as part of new faculty orientation
 - Awards and Accolades displayed prominently online
- Graduate Students
 - Commitment to graduate student mentoring
 - Science Fairs, Read-In, etc community involvement
 - Increased enrollment, mentoring in labs
 - Professional MSc
 - Promotion of interdisciplinary research opportunities
 - Split by department; more research required
- Undergraduate Students
 - Science is currently innovating in the area of improving undergraduate learning/engagement via a number of projects.
 - TLEF projects, including Science 100
 - Cohorts
 - Within the faculty and in partnership with other campus units such as Residence Services
 - Encouraging students to engage in community-based research opportunities combining discovery learning and civic engagement/service, e.g. science citizenship projects within courses
 - Commitment to expand 299 Research Opportunities Programs. CHEM 299, BIOL 299, and PSYCO 299 allow second year students to experience research in a low stakes credit/no credit learning environment
 - E-advising
 - Significant offerings in Honours and Specialization programs for 499 directed studies courses
- Other Projects
 - Centennial Centre for Interdisciplinary Studies –this state of the art facility will provide dynamic spaces for faculty, students and other members of the community to engage in dialogue, discovery and learning.
 - A faculty-level IT Plan to support teaching, learning, research, and technology
 - WISEST & HYRS connect scientific laboratories and methodologies to local high schools and prospective students
 - Executive Seminar Series

- Visiting Committee

Central Units

In addition to these faculty-specific initiatives, the University has also devoted significant resources to centrally supported initiatives designed to enhance its activities in the realms of teaching, learning, and discovery and creative activity.

Awards & Grants

- Vice-President (Research) instituted the Roger Smith Undergraduate Research Awards, to provide undergraduate research internship experiences in disciplines typically funded by SSHRC. The cost of these awards is co-shared equally with faculties.
- The Web site for the Office of the Provost and Vice President (Academic) offers an excellent list of awards and funding available at the University of Alberta (<http://www.uofaweb.ualberta.ca/provost/AwardsFunding.cfm>), including the Teaching and Learning Enhancement Fund (TLEF), the Killam Trusts, and various awards for teaching excellence
- The Office of Student Awards (as well as individual faculties) offer a number of scholarships and awards for students
 - Students can now view these opportunities through their Beartracks accounts

Support

Many central units exist in order to assist members of the campus community in various capacities.

- University Teaching Services (UTS) supports faculty and graduate students with activities related to teaching
- Academic Information and Communication Technologies (AICT) supports activities related to information technology, including E-learning support
- The Discovery Learning Network (DLN), established in response to *Dare to Deliver*, acts as “a catalyst for innovation and growth in the quality of the learning experience at the University of Alberta.”
- University Libraries offer extensive resources and support for teaching, learning, and discovery and creative activity.
- The Office of the Dean of Students supports many activities that exist to promote student engagement in campus communities, both academic and extracurricular.
- The International Center, the Registrar’s Office, the Research Services office and many other centrally funded units all provide extensive support to the campus community.

Appendix B

Inventory of Existing Activities related to Discovery Learning at Peer Institutions

Most, if not all teaching and research intensive public universities in Canada have expressed a commitment to improving the quality of educational offerings and level of student engagement present at their respective campuses as well as to strengthening the positive links between teaching and research or creative activities. This summary is by no means a complete inventory of those commitments and supporting initiatives. It is merely meant to provide some ‘food for thought’ for members of the University of Alberta community interested in promoting [whatever it is we’re doing]. This appendix includes an inter-institutional summary of most recent NSSE results as well as brief discussions of some activities at peer institutions focusing on the priorities articulated in their respective planning documents, new funding initiatives originating from the University administration that support the commitments in those plans, and the mission and offerings of their teaching services unit or equivalent.

National Survey of Student Engagement

Most Canadian universities that are members of the Group of 13 (G-13) utilize the National Survey of Student Engagement (NSSE) as part of their strategy for improving institutional accountability and the quality of education offered.

NSSE scores are interpreted using five “Benchmarks of Effective Educational Practice: level of academic challenge, active and collaborative learning, student and faculty interaction, enriching educational experience, supportive campus environment.”¹ These benchmarks are meant to focus discussion and guide efforts to improve various spheres activity broadly related to increasing student engagement. Scores are tabulated using responses from random samples of first year and senior year undergraduates.² The University endorses the expressed NSSE survey principle opposing public use of the survey data to rank institutions against one another; instead, the data is used to guide initiatives within the academy.

In the most recent round of NSSE results for the University of Alberta, it was found that the University was on the whole on par with its Canadian peers and lagging slightly behind the Carnegie schools included. The University of Alberta and the University of Toronto both fell slightly in most categories between their 2004 & 2006 surveys.³ Very few of the differences are statistically significant.

¹ Taken from the University of Alberta Report, NSSE 2006. Available online at <http://www.uofaweb.ualberta.ca/strategic/nav02.cfm?nav02=59806&nav01=18115&>

² More information about NSSE’s structure and methodology can be found at the NSSE website (<http://nsse.iub.edu/redirect.cfm>)

Specific results of the University of Alberta 2006 NSSE can be found online at <http://www.uofaweb.ualberta.ca/strategic/nav02.cfm?nav02=59806&nav01=18115&>.

³ Specific results of the University of Toronto NSSE can be found online at <http://www.provost.utoronto.ca/public/reports/NSSE.htm>. For U of A, see above.

A complete reporting of the University of Alberta's data is available from the Office of Strategic Analysis and the complete annual NSSE report is available on their website. Most institutions make similar reports available online.

Peers

University of Toronto

Academic Plan/Institutional Priorities. The University of Toronto's most recent Academic Plan, *Stepping UP* (2004) is a result of the most "broadly consultative" planning process the University has ever undertaken with such a document. Collecting input via a series of "green paper" submissions, the document represents a synthesis of feedback from all corners of the University community.

Through that process, the University articulated a vision of the University of Toronto as a leader among international public universities, deeply committed to the "preservation and sharing of knowledge through its teaching and research and its commitment to excellence and equity."⁴

Stepping UP identifies seven strategic priorities in service of this wider framework:

- Enabling teaching and learning and the student experience
- Enabling research
- Enabling interdisciplinary teaching and research
- Enabling faculty support and renewal
- Enabling staff support and renewal
- Realizing excellence, equity and diversity
- Enabling academic leadership and academic planning

The plan also includes a series of metrics intended to chart the progress made in fulfilling the institutional aspirations articulated in *Stepping UP*. These metrics are drawn from the University's results on the 2004 National Survey of Student Engagement.

Special initiatives funding related to teaching and learning. Academic Initiatives Fund (AIF) – The Academic Initiatives Fund (AIF) was set up by the Office of the Provost to provide financial support for initiatives arising from the University's Academic Plan. The AIF dispenses \$5 million annually and in the three granting sessions since its inception, has funded 71 projects out of 162 proposals.⁵

The Student Experiences Fund (SEF) "supports projects that enhance undergraduate student experience," a key priority of *Stepping UP*. Established in 2006, the SEF is budget to allocate \$21 million over three years to projects selected for their potential to have immediate, positive effects on the student experience across all campuses and is particularly targeted to support initiatives that will be positioned to impact students entering their first program of study at the University of Toronto. Many of the projects that have been funded so far involve upgrades to technology and facilities such

⁴ Information on *Stepping UP* taken from the *Stepping UP* framework, available online at <http://www.provost.utoronto.ca/plans/framework/final.htm>.

⁵ Information on AIF and SEF taken from information provided online by the Office of the Provost at <http://www.provost.utoronto.ca/Page2728.aspx> and <http://www.provost.utoronto.ca/Page2729.aspx>.

as the installation of a wireless internet network in the Varsity Building and classroom upgrades for disciplines ranging from music to cognitive science.

Support of professional development in teaching and for the scholarship of teaching and learning. The University's Office of Teaching Advancement (OTA) was established in January of 2002 with the intent of assisting the communities of the University "in the development of instructional skills, recognize[ing] teaching excellence and ensur[ing] that an effective balance is established between teaching and research."

The inaugural (and current) Director is a Professor from the Faculty of Arts and Science. OTA supports a wide variety of programs and professional development opportunities including extensive online resources, a publication series, a number of customizable workshops as well as an annual workshop series, individual faculty consultations, and a new faculty orientation series.

The University also holds an annual Teaching and Learning Symposium in the Fall term.⁶

University of British Columbia

Academic Plan/Institutional Priorities. The University of British Columbia's Central Academic Goals and *Trek 2010* vision articulate a vision for the university that harmonizes with academic plans at the level of individual units, faculties and colleges. *Trek 2010* is based on five pillars: People, Learning, Research, Community, and Internationalization. The five pillars are elaborated into guiding principles that the university's goals and strategies will be based upon.

The Academic Planning Process for UBC-Vancouver is currently underway and is being spearheaded by the Steering Committee for the Academic Planning Process (SCAPP), chaired by the Provost and Vice President (Academic). A significant part of the UBC Academic Planning Process is devoted to an overhaul of the institutional budget process.

The Lasting Education, Achieved & Demonstrated (LEAD) Initiative is a significant institutional priority aimed at enriching the student experience at the University of British Columbia.⁷ LEAD's goal is "a transformative advance in educational effectiveness." LEAD is supported by a Guiding Coalition of faculty and administrators from across the University's campuses including the University President, the Provost and Vice President (Academic), the Deputy Vice Chancellor of UBC-Okanogan, Nobel laureate Dr. Carl Wieman, and University Leader of Education Innovation Dr. Lorne Whitehead, among others.

Special initiatives funding related to teaching and learning. University Investment Fund (UIF) – The University Investment Fund (UIF) was created from a one-time year-end surplus in May 2007. It is administered as a one-time, non-renewable source of funding and disbursed by a selection committee chaired by the Provost.

⁶ Information on the OTA taken from their website at <http://www.utoronto.ca/ota>.

⁷ Information on LEAD taken from their website at <http://www.lead.ubc.ca/>.

The UIF dispersed \$12 million in summer 2008. Projects are expected to provide progress reports in fall 2008 for the 2009/2010 budget process. Fifty-one projects have been approved for funding.⁸

(http://www.vpacademic.ubc.ca/SCAPP/FPU_%20Feb%20_08.pdf).

The Teaching and Learning Enhancement Fund (TLEF) – The Teaching and Learning Enhancement Fund (TLEF) was created in 1991 to “enrich student learning by supporting innovative and effective educational enhancements”

(<http://www.vpacademic.ubc.ca/tlef/index.htm>). The TLEF is funded by student tuition fees; just under 3.5% of the tuition fees paid by domestic undergraduate and graduate students are contributed to this fund as well as 3.5% of the tuition fees paid by international students (ISI). Many funded TLEF projects focus on developing innovative course offerings.

Support of professional development in teaching and for the scholarship of teaching and learning. The University’s Teaching and Academic Growth Center (TAG) was initially established in 1987. TAG’s mission is to “foster quality teaching and learning across the University [and in] in doing so... take a leadership role in addressing professional development needs for current and future practitioners in higher education.”⁹

The Teaching and Academic Growth Center offers a wide variety of programs and support for professional development and the scholarship of teaching and learning including a new professor orientation program and graduate student teaching training.

University of Calgary

Academic Plan/Institutional Priorities. The University of Calgary is currently in the process of drafting their academic plan. Their previous document, *Raising our Sights* is available online.

Special initiatives funding related to teaching and learning.

Quality Money¹⁰ – Quality Money is an initiative of the University of Calgary Students' Union to provide funding to projects at the University of Calgary that will enhance the overall student experience. Funds allocated by the Board of Governors are used by the Students’ Union to fund projects designed to enhance the student experience such as classroom size reduction, scholarships and bursaries, and building renovations. Since its inception in December 2003, Quality Money has funded forty-nine projects and disbursed approximately \$5.1 million. The Graduate Students’ Association also receives a disbursement from the Board for “quality enhancement projects.” Their 2007 disbursement was approximately \$327,000 and was disbursed among a variety of projects including providing funding support for a number of programs offered by the Teaching and Learning Center.

*Support of professional development in teaching and for the scholarship of teaching and learning.*¹¹ The University’s Teaching and Learning Center (TLC) was initially established in

⁸ Information on the UIF taken from the February 2008 Report of the funding committee, available online at http://www.vpacademic.ubc.ca/SCAPP/FPU_%20Feb%20_08.pdf.

⁹ Information on the TAG was taken from its website at <http://www.tag.ubc.ca/>.

¹⁰ Information on the Quality Money initiative taken from the website of the University of Calgary Students’ Union (<http://www.su.ucalgary.ca/>) and from minutes of the Graduate Students’ Association.

¹¹ Information on the TLC taken from their website at <http://commons.ucalgary.ca/services>.

1987. The TLC has four strategic priorities: to provide teaching and learning development activities, precipitate and support curriculum renewal, support technology innovation and adoption to enhance teaching and learning, and foster and disseminate research associated with teaching, curriculum, and learning technologies.

The Teaching and Learning Center offers a wide variety of programs and support for professional development and the scholarship of teaching and learning including extensive workshops, professional development programs, a searchable listing of teaching award winners at the University of Calgary and online resources for improving teaching and strategies to effectively encourage inquiry-based learning.



Appendix C

TLAT Practice Subcommittee Performance Indicators

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Performance Indicators for Enhanced Teaching and Learning

Jim Bohun, Katy Campbell and Frank Robinson

TLAT Practice Sub Committee

Project Objective: Develop benchmarks and/or performance indicators to be used to evaluate the results achieved through various initiatives and programs (e.g. Teaching and Learning Enhancement Fund, Teaching with Technology Initiative, University Teaching Services) in providing assistance for teachers to develop Discovery Learning skills appropriate to their discipline.

***Dare to Discover:** Learning Discovery and Citizenship states that we will “Create an exceptional and life-changing university experience for students through curricular and extra-curricular offerings that integrate learning, discovery, and citizenship to develop the intellect and the imagination, educate leaders, and enhance a global perspective.*

***Dare to Deliver** (Nov. 2006) states that we will strive to “Provide professional development assistance for teachers to develop Discovery Learning skills appropriate to their discipline. We have several established and emerging ways to fortify Discovery Learning. University Teaching Services educates and assists faculty, lecturers, sessionals and graduate teaching assistants from across the university. The Teaching and Learning Enhancement Fund will be a vehicle to support Discovery Learning as part of its overall mandate to improve teaching and learning effectiveness. The Telus Centre, repurposed as an academic building, will house the Teaching-Learning Institute, which will have an academic governance structure whose mandate will be to actively promote the integration of teaching, learning, research and use of technology. It will also provide the space and technological infrastructure for pilot projects designed to improve teaching and learning.”*

Project Notes:

1. The benchmarking will be focused at departmental, faculty and institutional levels (not at individuals or teams)
2. Some benchmarking will be recorded annually. Other benchmarking will occur at 5 year intervals.

Benchmarks and/or performance indicators to be used to evaluate the results achieved through various initiatives and

| programs in providing assistance for teachers to develop Discovery Learning skills appropriate to their discipline. | | | | |
|---|---|---|---|---|
| Evidence of Increased Interest in Teaching Effort <i>(Have our initiatives stirred an interest in teaching and learning in more instructors?)</i> | Evidence of Increased Interest in Researching Teaching <i>(Have people acted to show that they are more interested in teaching and learning by application to programs to research their teaching?)</i> | Evidence of Completed Researching Teaching <i>(Have people completed a project in teaching and learning enhancement, or researching their teaching?)</i> | Evidence of Enhanced Teaching <i>(Is there evidence that the quality of teaching has improved through their (and our) efforts?)</i> | Evidence of Enhanced Learning <i>(Is there evidence that the quality of learning has improved through their (and our) efforts?)</i> |
| Attendance at presentations on faculty development offered by faculties and UTS (B)* | Number of grants submitted to TLEF and other sources (faculty programs) (C) | Extent to which TLEF proposal objectives were met (evaluation of final report). <i>Some of this may require a subsequent follow-up to the final report after student, peer or self evaluation was undertaken. (C)</i> | | |
| Attendance at teaching and learning symposia and conferences sponsored by the U of A (C) | Number of McCalla Professorship applications (C) | Number of journal submissions of TLEF research projects (C) | Data from Faculty focus groups (E) | Follow up of 2006 Senate Task Force (G) |
| Self assessments of enhanced interest in teaching (needs specific behaviors to quantify on FEC Annual Reports) (A) | Web Presence and hits on U of A teaching sites (C) | Number of presentations and reports on Researching teaching to internal and external groups (conferences) (D) | USRI teaching evaluation scores (may need to add new indicators of learning) (H) | Comments from student exit surveys (E) |
| Activity in Community of Practice (blogs, discussion, pubs, participation) (C) | Survey of faculty to determine state of interest and knowledge in research on teaching (E) | Progress to meeting Faculty specific learning outcomes (D) | Comments from student exit surveys (E) | Track Failure, retention and graduation rates (E) |
| Number of participants in UTS Peer Consultation Program (B) | | Evidence of sharing research results to community (E) | Number of courses which offer discover learning (E) | Student feedback (eg. NSSE, CUSC surveys) (F) |
| Number of peer teaching evaluations conducted within faculties (D) | | | Evidence of instructor's 'enhanced reflection on teaching' (E) | Evidence of student's enhanced reflection on learning (E) |
| Library collections of teaching materials (C) | | | | Evidence that students have achieved critical thinking, problem solving, communication etc. skills upon completion of the program (E)? |
| Focus groups in faculties to see how people perceive teaching (E) | | | | |
| Number of new teaching innovations (E) | | | | |
| Formal pedagogical training (certificates, etc) (E) | | | | |

*Sources of Information:

- A. FEC Reports (Annual)
- B. UTS Reports (sessions, peer consultations, web hits) (Annual)
- C. TLEF Reports (grants, final report reviews, follow-up dialogue with researchers, web hits) (Annual)
- D. Reports from Faculty TLAT sub-committees
- E. Faculty Unit Reviews (approx every 5 years)
- F. NSSE, CUSC surveys (? Frequency)
- G. Follow up of 2005 Senate Task Force on Student Engagement (2010?)
- H. U of A USRI Data Bank