

HUMAN RESOURCES AND SKILLS DEVELOPMENT CANADA

Innovative Practices Research Project

COHERE Report on Blended Learning



Collaboration for Online Higher Education and Research (COHERE)

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Executive Summary

Blended learning has the potential to enhance and transform Canadian higher education in teaching and learning, in flexibility and access, and in the optimization of resources. It also helps to provide the digital literacies essential for a global graduate and knowledge worker.

Blended learning, the thoughtful integration of face-to-face and online learning, is a growing practice in higher education, both within and beyond Canada. Blended learning has emerged in response to the increasing need and demand to respond to diverse students' needs, to provide engaging and meaningful learning experiences, and to optimize increasingly scarce resources for higher education. It has drawn the interest of several OECD countries. In the USA, the University of Central Florida (UCF) has identified it as a transformative practice impacting faculty and students across the institution and has adopted blended learning as a strategic agenda over the past 13 years. Drawing on over a decade of experience in institution-wide blended learning, UCF reports consistently over 85% student success¹ in blended learning offerings. The Sloan Consortium has held annual conferences on blended learning for the last eight years, with increasing participation each year. In the United Kingdom the Higher Education Funding Council of England (HEFCE) has funded multi-year initiatives in blended learning, one of the most successful being at the University of Hertfordshire. Clearly, blended learning is being implemented in higher education in many regions of the globe.

Blended learning is an emerging and promising trend in Canadian universities. This Collaboration for Online Higher Education (COHERE) led Report explores the current status of blended learning in Canadian higher education, providing examples of innovative and successful practices as well as discussing the challenges and barriers faced by universities involved in blended learning. COHERE has adopted a particular focus on blended learning over the last four years, including the hosting of an annual national conference on blended learning. Therefore, drawing on the COHERE membership experience provided a logical starting point for producing a snapshot of blended learning in the Canadian university context. However, the findings reported here are limited to COHERE members and do not include innovative blended learning practices at other post-secondary education institutions in Canada.

A questionnaire to ascertain blended learning policies, practices and activities was sent to ten COHERE member universities. Due to the time constraints of this study only eight universities responded to the questions and provided documents such as strategic plans, research reports on blended learning applications, and business cases. University websites and support units on

¹ Student success is defined as a grade of C or above.

teaching and learning were also investigated to gain additional information about current projects and practices.

The blended learning practices at the eight responding universities vary from a single course to a degree program. Many interactive technologies such as blogs, wikis, social media, video/audio conferencing, discussion forums, Second Life™, lecture capturing, iPads or mobile technologies have been integrated into the blended learning environments to enhance students' engagement and learning.

According to the surveys, interviews and research projects conducted at the eight universities, these innovative practices have resulted in improved teaching and learning, greater flexibility for learners, greater student satisfaction, improved student performance, a confluence of literacies for the knowledge economy, and optimization of resources.

The universities also identified several barriers and challenges that impacted the blended learning activities and agendas at their institutions. These barriers included faculty resistance, student reluctance to move from a passive to an active student role, insufficient pedagogical and technical support, and absence of a clear institutional policy and strategic plan and appropriate leadership to support and sustain blended learning initiatives.

Despite these barriers blended learning at Canadian universities continues to grow. The evidence and examples drawn from the data suggest it is a promising practice for post secondary institutions, with the potential to foster a skilled and productive globally competent workforce.

However, according to the COHERE respondents, for blended learning at Canadian universities to move from individual faculty and department initiatives to successful and sustained integration at the institutional level a strategic approach, clear definitions, pedagogical and technological support and dedication of resources and infrastructure will be required.

Introduction

There is an increasing need and demand to respond to diverse students' needs and provide engaging and meaningful learning experiences in higher education. Compounded with new technologies beyond and within the academy, this inevitably draws information and communication technology into traditional learning environments. McGreal and Anderson's (2007) review of e-learning in Canada finds that the majority of Canadian universities have a web-based² component in many courses and that this integration of technology in learning is expanding. In 2011, following this trend, it is plausible to expect a higher rate of integration of web technologies into traditional courses. In the USA, Allen and Seaman (2010) report that over 30% of undergraduate learners participate in some form of online/blended/technology mediated learning and over 70% of US higher educational institutions indicate that online learning is critical to their long term strategy. Further, participation in the Sloan Consortium Blended Learning Conference has been increasing over the last eight years. Notably, the Eighth Annual Conference (2011) recognized that the incorporation of blended learning is expanding. Moreover, this growth of blended learning is based on evidence – evidence of its ability to positively impact teaching and learning, access, time to degree, and efficiency, all of which are key challenges in higher education.

This Collaboration for Online Higher Education Research (COHERE)³ led Report explores the current status of blended learning in Canadian higher education, providing examples of innovative promising practices, along with the barriers that impede the extent to which Canadian institutions are able to adopt these practices. Specifically, the report provides the following:

- 1. An overview of leading innovative practices in blended learning.**
- 2. A summary of current evidence** on the effectiveness of such innovative blended learning practices.
- 3. An overview of the extent to which Canadian universities are adopting these practices.**
- 4. A brief overview of the key barriers to the expansion** of effective blended learning in Canadian universities.

² Web-based components can be accessed directly on the internet through a web browser. These components do not require any additional software to be installed.

³ Established in 1999 COHERE <http://cohere.ca/> has concerned itself with the research about and practice of blended learning. Comprised of research and program intensive, primarily face-to-face institutions, the Collaboration has developed a position paper on blended learning and a monograph of occasional papers, has conducted inter-institutional case study research, and has hosted four national conferences on blended learning.

The specific questions addressed in this research project are:

- In what ways are universities using digital technology to deliver blended learning?
- What are the most effective uses of digital technology to deliver blended learning?
- What are the most innovative blended learning practices in Canadian PSE institutions and how do they influence/change teaching and learning?
- How does Canada compare with other countries in adoption of digital technology (with a focus on blended learning) in higher education?
- How is blended learning perceived and practiced in Canadian PSE institutions?
- What are the institutional benefits of these innovative blended learning practices? (e.g. economies of scale, cost savings, business cases)
- What are the most significant barriers to greater adoption of innovative use of blended learning in Canadian PSE institutions?

A questionnaire addressing the above questions was sent to ten universities which are members of COHERE. Eight universities⁴ responded to the questions and also provided other documents such as strategic plans, research reports on blended learning applications, and business cases. University websites and support units on teaching and learning were also investigated to gain additional information about the current projects and practices. These responses to the questionnaire (along with the associated university documents) are the primary source of data in the report, augmented by an overview of current literature on blended learning.

Defining Blended Learning

Garrison and Vaughan (2008) define blended learning as “the organic integration of thoughtfully selected and complementary face-to-face and online approaches and technologies” (p. 148). According to this definition and using George Siemens’ concept of innovation, which is “*Innovation is about being new...doing existing things in a new way, or doing something new in response to changes. Innovation is part evolution and part adaptation (and occasionally, part revolution),*” clearly blended learning is an innovation; it involves teaching and learning in a new way, while still adhering to the tenets of higher education. Moreover, it is a very significant innovation as it requires thoughtfully integrating face-to-face and online learning, fundamentally rethinking course design to optimize student engagement, and restructuring and replacing traditional class contact hours. Compared to fully online learning, blended learning, in the true sense, is still new and emerging. Matheos, Daniels and

⁴ The universities that responded are the University of Calgary, Mount Royal University, York University, University of Manitoba, Memorial University, University of Regina, University of Waterloo and University of Saskatchewan.

McCalla (2005) suggest its early presence in the corporate world. Corporate researchers and practitioners note that technology enhanced learning alone is not enough, arguing that people need experiential learning for the mastery and retention of knowledge and skills achieved through the blending of technology and face-to-face interaction (Singh, 2003; Collis, 2002).

Blended learning has been on the institutional agenda for 13 years at the University of Central Florida and is thought to have the potential to impact students and faculty members and be a force for transformation (Hartman, 2010). It has the potential to improve teaching and learning, increase access and flexibility for students, maximize resources, and provide a confluence of digital literacies for learning and working. Hartman (2010), drawing on over a decade of experience in institution-wide blended learning, reports that, consistently, over 85% of the participating students have had a grade of C or above.

Developments and Innovative Practices at COHERE Member Universities

Blended practices at the COHERE member universities are very promising, but their potential is often limited by challenges and barriers identified by the universities and noted later in this Report. Despite these challenges and barriers identified by universities, an encouraging sign is that not only is there an increase in blended learning applications but there is also an increase in research exploring several aspects of these learning environments so as to increase students' learning and satisfaction at the universities surveyed. Overall, it could be said that there is an increasing awareness on the need to adopt an organized and inclusive approach towards developing blended courses at universities.

University responses indicate a growing interest and support at the administrative level as well; however, blended learning is still not part of stated objectives or a separate policy documents at the responding universities. As Wallace and Young (2010) indicate, blended learning at Canadian universities has been largely undertaken at the initiative of individual instructors, rather than in response to explicit institutional or faculty level direction.

The following provides a snapshot of the innovative practices within Canadian universities that are members of COHERE. In general, those institutions report that the innovative use of blended learning has yielded improved teaching and learning, greater flexibility for learners, greater student satisfaction, improved student performance, confluence of literacies for the knowledge economy, and optimization of resources.

The **University of Calgary** offered an annual funding program from 2004-2008 to instructors who wanted to fundamentally redesign the delivery of their courses to a blended format. The program aimed to take a strategic approach to instructional design, emphasizing inquiry as a way to foster deep student learning. Following the implementation of the blended learning

courses, student surveys and instructor interviews were conducted. These indicated an increase in the quantity and quality of interaction within these courses. Students also identified the need for clear expectations, structure, direction, and support as they moved from face-to-face to blended learning instruction. Due to the lack of funding, the program was discontinued in 2008 and currently no such large scale initiative exists at the university.

However, this larger blended learning initiative has been the impetus for subsequent smaller innovative practices at the University of Calgary. There are many innovative practices and projects going on at the University such as course blogging communities, collaborative wiki spaces or synchronous online sessions using several videoconferencing technologies ranging from Skype to HD dedicated videoconferencing rooms. For example, using the Word Press blogging software, several faculty members are employing community websites in their classes to provide a rich online discourse. The pilot campus blogging service now hosts 670 websites with over 2100 users. One student group term project on collaborative wiki spaces, authored live on the wiki, has received over 126,000 views.

One larger initiative at the University is the Learning Circles program offered by the Faculty of Social Work. The Learning Circles program is an accredited Bachelor of Social Work which is designed for students in rural, remote, and/or Aboriginal communities across Canada. The program is delivered through a blended learning format, allowing students to complete their social work degree in their own community while maintaining full-time employment. To complete their degree in 24 months, students are required to participate in synchronous or real-time (e.g. online chats, audio conferences) and asynchronous (e.g. posting to discussion board, exercises) learning activities and travel to Calgary once each year for a period of one week. More information about this program can be found at: <http://fsw.ucalgary.ca/Distance>.

Mount Royal University has been offering blended courses for more than a decade. In 2000-2003 the Course Adaptation Research Project conducted an evaluation of selected blended learning courses and involved a survey of students enrolled in blended delivery courses. The students reported they had an enhanced understanding of course content in the blended learning environment. A subsequent study of student experience in blended first year courses at Mount Royal indicated that students who perceived a higher level of active and collaborative learning in these courses also achieved the best final course grades (Vaughan, Zimmer & Villamar, 2011). Many interactive learning technologies such as blogs, wikis, social media sharing and networking applications are used in these blended courses to enhance student learning and engagement.

One of the important initiatives at Mount Royal University designed to expand the effective integration of technology into teaching and learning is the Tech Test Drive event organized by the Teaching, Learning, and Technology Roundtable (TLTR). The Tech Test Drive is an annual

event organized to bring together those who are using technology to enhance student learning with those who are interested in learning something new about technology to foster communication between them. Support and guidance to develop blended courses are also provided by the Academic Development Centre at the university.

York University recently published a Provostial White Paper that focused on creating a more engaging experience for its students. Five working groups were asked to explore options and elaborate possible models to implement the report's recommendation(s). One of these groups proposed an e-learning model with a specific recommendation for the use of blended learning. In addition some of other projects suggested incorporation of some e-learning or blended learning applications as components of their model.

Subsequently, a \$2.5 million fund was created to fund innovative projects that support the goals of the White Paper; the review process currently ongoing. A key component of the initiative at York University was the development of a business case for e-learning, which took into account faculty development costs, technical development support and infrastructure costs, along with the cost avoidance stemming from blended learning (space savings from more efficient use of existing classrooms and avoidance of new building). This business case included projected enrolments and indicated that in five years investment costs could be recouped by the institution. Further information about the white paper process can be found at http://vpacademic.yorku.ca/whitepaper/working_groups/index.php and the e-learning business case report is at <http://irlt.yorku.ca/reports/E-learningcasefinalversion.pdf>.

One innovative blended learning practice at York University is enabling interaction between a graduate and undergraduate course utilizing blended design strategies. Both courses are on similar topics (the graduate course is "Issues in Digital Technology in Education" and the undergraduate course is "Teaching and Learning with Digital Technology"). Both courses use a blended design with each course having a reduced face-to-face class time replaced with online components. Within the online component there is a connection between the two courses when the graduate students, most of whom are experienced teachers, join the project groups in the undergraduate course, and serve as mentors to the undergraduate teachers in training. The course instructor reported that students in both classes have been very positive about their learning experience. Besides the flexibility that the blended design provided, (each class had reduced face-to-face instructional time) all students enjoyed the opportunity to interact with each other; graduate students enjoyed sharing their expertise with upcoming teachers and undergraduate students appreciated receiving the advice and guidance offered by experienced teachers.

At the **University of Waterloo**, blended courses are supported pedagogically through the Centre for Teaching Excellence (CTE) by the six liaisons who work within the six faculties of this

University. The CTE website has a specific section about blended learning which includes information about design principles, description of best practices and examples of numerous blended courses (See http://cte.uwaterloo.ca/teaching_with_technology/index.html). One example is the course on “Integrated Patient Focused Care” (IPFC) at the faculty of Pharmacy. It is an integrated course focusing on pharmacokinetics which is almost completely delivered online and foundational material. Students access online presentations, do activities online, and receive problem-sets and assignments. Once a week there is a one-hour face-to-face tutorial where the instructor works through an assigned problem set and answers questions. An online discussion board is also provided as a forum to ask questions of peers and the course instructor. The research about the effectiveness of this course showed that student enthusiasm for the blended method of course delivery, interaction with the online course modules, and face-to-face interaction with the professor during problem-solving tutorials increased significantly between the beginning and end of a 6-week blended pharmacokinetics course (Edginton & Holbrook, 2010). The data from University of Waterloo indicates that the number of courses that employ online learning and classroom learning in a more interactive and complementary way is increasing.

There are many successful projects and creative applications developed to address opportunities and challenges related to technology enhanced learning at **Memorial University**. This University’s response to the questionnaire highlights the financial support for these projects and developments at a strategic level. However, the University does not have any project specifically focused on blended learning. The Distance Education and Learning Technologies (DELT), as the support unit of the University, is responsible to assist, develop, and support distance education and the on-campus use of technology, which also includes blended learning. Overall, there are over 1500 course sections utilizing technology on campus. The university has also engaged in two large international projects: one project funded by the African Development Bank in partnership between Memorial University (DELT) and the University of Ottawa to build capacity with the African Virtual University, and the second funded by the Caribbean Development Bank to develop a concept for a single virtual university space for the University of the West Indies.

The **University of Saskatchewan** has benefitted from ten years of provincial investment in Technology Enhanced Learning (from 2000 – 2010), though that initiative was ended by the Government of Saskatchewan in 2010. While the majority of the investments under that envelope were dedicated to distance education initiatives, several investments were made in technologies to support blended and distributed approaches to education for undergraduate and graduate students, including a significant investment in lecture capture technology that will continue into the future even though the provincial funding has been terminated. In part as a response to the ending of the targeted provincial funding in Technology Enhanced Learning, the

University of Saskatchewan recently announced the funding of a Curriculum Innovation initiative, which will include permanent base funding of instructional design and curriculum development specialists as well as the creation of a small curriculum innovation project fund that will support innovations across the campus, including but not limited to uses of technology to enhance learning. As well, an E-Learning Task force, struck by the Provost and Vice-President Academic, recently recommended significant investments and additional institutional coordination in blended, e-learning, and distributed learning over the coming years.

Moreover the regular program reviews and plans for curriculum changes provide timely opportunities to further explore the integration and implementation of technology to enhance learning outcomes. Although blended learning is not specifically articulated in the strategic documents of the university, support for technology enabled learning is touched upon in a range of planning documents such as Second Integrated Plan (2008-2012). In addition, the University of Saskatchewan now promotes the integration of technologies such as web/video conferencing, mobile technologies, and podcasting into its course offerings. The University of Saskatchewan also has a development project for a light weight template with a basic set of course tools, to which more sophisticated tools can be added as required.

The College of Nursing and the College of Medicine have embraced video conferencing technologies in order to meet their real need for distributive learning, to reach learners at multiple sites throughout the province, and to prepare future professionals for e-health careers. The goal for the nursing program is to make specific programs fully available at the main campus and also at three or more remote sites with instructors stationed at both main and remote sites.

The **University of Manitoba** places a strong emphasis on innovation in teaching and learning for the ultimate purpose of increasing student learning outcomes, and provides a small funding envelope for such innovations. In particular, University Teaching Services and Extended Education's Distance and Online Education unit are collaborating on projects to advance blended learning and are providing support for faculty to develop and implement blended learning. For example, Extended Education recently designated over \$21,000 to the 2011 Summer Session Innovation Fund toward the development of innovative programs and courses. This has led to the development of five new blended courses that will be available in Summer Session 2011. Funding was also provided for a study with faculty members and administrators to identify the academic policy and process issues relating to blended courses (Wallace & Young, 2010).

Another large scale innovation at the University is the transformation of its traditional "Introductory Psychology" course, one of the most subscribed undergraduate courses, into a blended learning offering. This project was driven by the lack of professorial resources, the

need to develop consistent outcomes, and the need to provide more flexible options for students. The blended course currently serves the vast majority of psychology students – 2500 of the approximately 2700 on campus students each year. Presently only three classes remain in the traditional face-to-face mode, offered in evening/weekend slots, serving approximately 200 students.

The “Introductory Psychology” blended learning course uses webcast videos, provides online resources and links, and uses email to communicate course-related announcements and information, all of which are embedded in the learning management system (LMS)⁵. It is led by two faculty members who meet with the students face-to-face in large classroom sessions twice each term. Weekly face-to-face tutorials are led by graduate student teaching assistants. During the tutorials students have an opportunity to ask questions, review materials, etc.. The blended learning design, (online activity and graduate student led face-to-face tutorials) is cost effective and allows for the optimization of faculty resources, with only two faculty members serving 2500 students, whereas a traditional face-to-face model involving class sizes of 100 would require 25 faculty instructors. Moreover, the initial blended course was designed in concert with the development of the online distance course offering, which led to significant savings and sharing of online materials. The blended course has been offered over the last two academic years, and the Psychology department plans to continue this offering to serve the vast majority of its first year students. The project is entering its third year and initial review of data has shown that retention data is equivalent to that of face-to-face offerings. Further research regarding grade comparisons with face to face offerings is underway.

The **University of Regina** has been involved in technology enhanced learning for over a decade and has been the recipient of an ongoing provincial fund to build this capacity at the institution through the university Distance and Distributed Learning Committee (DDLC). However, with the demise of this targeted provincial funding the University of Regina is now required to look to internal funding mechanisms for these initiatives.

Responding to the fast moving evolution of blended learning both nationally and internationally, the DDLC has struck a small taskforce to explore the cost of supporting a campus-wide blended learning strategy. The taskforce will develop a specific definition for blended learning suitable to the University of Regina landscape (drawing from current research in this field) and will explore ways in which blended learning can be phased gradually into the university structure, preferably with a department or faculty moving to a blended delivery mode. Any campus-wide blended learning initiative will need to align with the overall

⁵ A Learning Management System is a software system that hosts course content, interaction and assessment on the web. Essentially it is virtual classroom where online courses or components of courses are developed and delivered.

University of Regina Strategic Plan, particularly with regard to excellence in teaching, responsiveness to learner needs, and the implementation of a programmatic approach. Finally, consideration must be given to costs involved in providing learning and teaching support, which, though initially significant, should lessen with time.

To date the University has delivered blended learning courses, but they have been more focused on the distance student, with short and intensive instructor visits to field sites combined with online learning. There have been no formal blended learning courses offered to the on-campus students.

Benefits of and Barriers to Blended Learning

Benefits to Teaching and Learning

The analysis of the universities' responses to our questionnaire about the effects of blended learning from students' perspectives revealed that students have positive experiences with and attitudes towards blended learning. According to the surveys, interviews and research projects conducted at the universities, students saw the flexibility afforded by blended learning as a key advantage. Students also enjoyed the increased opportunities for interacting with classmates and the instructors through the integration of new technologies. The recent study of blended first year courses at Mount Royal demonstrated that students who perceived a higher level of active and collaborative learning in these courses were also the most successful, based on final course grades. Students who most frequently accessed the course learning management system to complete assessment tasks were also the ones with the highest final grades in these courses. It appears that the online interaction, collaboration and assessment were contributing factors to student performance – e.g., better grades (Vaughan, Zimmer & Villamar, 2011). These results are consistent with prior research findings in Canada and other countries (Vaughan, 2007; So & Brush, 2008; Arbaugh, Godfrey, Johnson et al., 2009; Siew-Eng, Ariffin, Rahman & Leong, 2010; Hartman, 2010).

The second advantage of blended learning is improved learning outcomes found through student surveys, formal studies, and informal feedback. University responses attributed the improved learning outcomes to the increased quality of interaction among learners, between students and instructors, and the richness of learning resources. Current research findings corroborate the responses that suggest higher learning outcomes in blended learning environments (Vaughan, 2007; Akyol & Garrison, 2011; Vaughan, Zimmer & Villamar, 2011). Internationally, blended learning research reveals similar findings. In a recent study conducted at a Spanish university with a large sample it was found that blended learning had a positive effect on reducing dropout rates and in raising exam pass rates (López-Pérez, Pérez-López & Rodríguez-Ariza, 2011). Drawing on over a decade of experience in institution-wide blended

learning Hartman (2010) reports consistently over 85% student success⁶ in blended learning course offerings. Similarly, the study authored by Collopy and Arnold (2009) shows that students in the blended courses reported significantly higher level of learning than those in the online course. Collopy and Arnold also review various studies on blended learning, concluding that content learning outcomes are similar across both blended learning and face-to-face learning environments.

University responses reflected a unanimous faculty perspective that blended learning creates flexibility, enhances sense of engagement, and provides greater time to reflect in online discussions. However, responses regarding workload and blended learning provided differing views. Instructors at the University of Saskatchewan and the University of Calgary indicate increased workload and time to develop a blended course. On the other hand, the feedback from the instructors the University of Waterloo reports no change on workload when offering blended courses.

The responses from the universities underlined the importance of instructional design of blended learning for optimal learning outcomes. Specifically, the importance of a balance between the online and face-to-face components of the course was articulated. For example, a study conducted at the University of Waterloo revealed that, although students appreciated flexibility in time, place, and pace of learning in blended courses, they placed high value on face-to-face interactions with their instructors and among classmates (Edginton & Holbrook, 2010). Another observation made by the students from Memorial University was that there was no uniform way of using the online component of blended learning.

Vaughan (2010) notes that blended learning can be an opportunity to fundamentally redesign teaching and learning approaches in ways that realize increased effectiveness, convenience, and efficiency. The literature also indicates that blended learning provides a way to better address the multiple needs of learners. According to Laumakis, Graham and Dziuban (2010), “blended learning has established a culture of sustainability in higher education, providing accessibility to the most diverse student population in history [and having] the unanticipated side effects of raising students’ expectations and their standards for learning” (p.86). The authors foresee that the impact of blended learning is monumental, permanently changing students' interaction with higher education.

Student, Faculty and Institutional Benefits

The most significant gain for the university through blended learning applications will be the change in practice through integrating face-to-face and online practices in a meaningful way (Nemiec & Otte, 2010). Ellis and Goodyear’s findings indicate that students, however media-

⁶ Student success is defined as a grade of C or above.

savvy they might be, are keen to see a good balance struck between face-to-face and technology-mediated activities (Ellis and Goodyear, as cited in Jefferies & Hyde, 2010).

Blended learning is potentially the most transformative and pervasive initiative an institution can undertake (Hartman, 2010). However, the impact of a blended learning initiative depends on the expectations and motives for engaging in blended learning; it could entail vast institutional change or could be very limited (Niemic & Otte, 2010). Garrison (2003) stresses the importance of a strategic institutional agenda for blended learning and cautions against an ad hoc approach. Although there may be significant upfront costs if an institution's current technical infrastructure is insufficient, increased revenue could be realized through the expansion of programs and students. The reduced face-to-face time offers greater flexibility for learners.

For faculty, blended learning is a safer mid-point, between the familiar of face-to-face learning and the often unfamiliar online learning. Blended learning also enables and expands existing resources, particularly blending the tools and technologies available for distance learning in the classroom. Moreover, blended learning can also utilize distance education resources such as learning objects, videos etc. within the online components of blended learning classes. Blended learning models can also lead to cost reductions for students such as decreasing travel costs to come to campus. The research conducted by Twigg (2003) to assess the outcomes of a project on restructuring courses integrating technology in a variety of ways at 30 colleges and universities showed an average cost savings of 41% per student after the redesign of the courses. This cost saving is a result of decreasing faculty numbers for course delivery, hence freeing up faculty to teach other courses, eliminating adjunct faculty, and serving more students with the course. Twigg's work is both comprehensive and compelling and her findings corroborate the affordances of blended learning.

Blended learning may also generate savings as the efficient use of face-to-face learning environments can lead to decreased construction and operating costs. The University of Central Florida could save \$7 million in construction costs and over \$227,000 in annual operating costs through the implementation of blended learning (Hartman, 2007 as cited in Owston, Wideman, Murphy & Lupshenyuk, 2008). The aforementioned project at the University of Manitoba in the offering of Introductory Psychology provides a cost effective and sustainable model, as does the business case for blended learning from York University.

COHERE member universities suggest that blended learning must be integral to broad institutional goals if it is to create a significant impact on teaching and learning and transform higher education. For example, some universities identified "exceptional student experience" as a pillar of their institutions, and noted that blended learning clearly has the potential to

enhance the teaching and learning at their institutions. Internationally, other countries have made investments in blended learning that speaks to this potential. The Higher Education Council Funding for England supported a five year blended learning initiative at the University of Hertfordshire. In the USA, the Pew Foundation provided funding for course redesign to blended learning. In Malaysia the government is supporting blended learning initiatives to provide equal learning opportunities for everyone (Siew-Eng, Ariffin, Rahman & Leong, 2010).

Barriers and Challenges

Renes and Strange (in press) argue that technology is no longer unreliable or unstable; now it is the human factor rather than the technology factor that is limiting the adoption and application of technology enhanced learning environments. The transition from a traditional teaching and learning experience to a blended one is not an easy process, and challenges students and faculty to interact differently with each other and with content. The first step is a clear institutional understanding of blended learning in order to expand and increase the willingness of its adoption by faculty. As Picciano (2009) suggests, without a clear definition, blended learning is perceived as a vague combination of online and face-to-face instruction. It is a fundamental redesign that transforms the structure of, and approach to, teaching and learning and therefore must be approached with the awareness of the challenges of doing things differently (Garrison & Vaughan, 2008).

The responses from the universities point out several barriers and challenges that must be addressed in order to adopt and expand blended learning practices. The responses note that the primary challenge for students is the transition from a passive to an active/collaborative learning approach that comes along with blended learning. This puts more responsibility on students, requires them to reconsider their study habits and time management skills, and to use sophisticated technologies (Vaughan, 2007). Orton-Johnson (2009) investigated why some students reject the use of the materials in blended courses. She found that one reason for students' rejection of blended learning is related to their trust in traditional printed texts as authentic academic knowledge, rather than web-based sources. Her study also highlights the ways in which blended learning resources can challenge existing learning patterns and practices.

Faculty are often resistant to apply blended learning strategies, to reduce class time, to integrate unfamiliar technologies, to take on the perceived additional work in developing blended courses. However, the resistance to blended learning is less than the resistance to fully online learning due to its mixture of the familiar and the unfamiliar (Niemic & Otte, 2010). The responses of the universities reveal two main issues regarding faculty adoption of blended learning: recognition and support. Blended learning brings new responsibilities and

roles to teachers who already have significant workloads and are therefore less willing to change (Vaughan, 2007; Guri-Rosenblit, 2009; Alebaikan & Troudi, 2010; Ocak, 2011).

Faculty members who pursue innovative teaching practices should be recognized and incentives should be offered both to value their efforts and encourage others. Several COHERE members responded that younger faculty members, the majority of whom possess strong technological skills, when facing the tenure process do not have the time to invest in the research and practice of blended learning, but must focus on research solely within their discipline. Central within the COHERE consortium and a foundational principle in its formation is the integration of blended and online learning into the research culture and agenda of the institution.

Ongoing pedagogical and technological support is essential to faculty throughout both development and delivery of blended learning. Developing a blended course, especially preparing resources and materials for online teaching, requires faculty to devote much more time than preparing for a face-to-face classroom presentation. Learning and integrating these new teaching and technological skills constitutes a source of added stress and burnout (Guri-Rosenblit, 2009) which often decreases motivation to either engage or continue in the process. However, as blended learning brings together the familiar (classroom) and unfamiliar (online), it can be a less daunting endeavor than online learning (Hartman, 2010). These issues were identified in the university responses corroborating the need for continuous pedagogical and technological support. University responses stressed the need for collaboration among units such as teaching and learning centres, technological and innovation centres, and other areas to work with faculty during the instructional design process. Essential are training programs and workshops for technical and pedagogical skills, along with instructional design and instructional technology to develop interactive learning resources and materials.

The respondents noted that progress in blended learning plans and projects have been, for the most part, a result of uncoordinated individual innovations designed to respond to the needs of students and that there is a considerable lack of institutional, provincial and national awareness of and support for these initiatives. Many such innovations receive only pilot funding (whether from internal or external grants), often producing very promising early results only to be discontinued due to lack of resources. Until Canadian institutions integrate blended learning into both their research agendas and strategic plans it will be difficult to move forward.

The university responses identify two main issues in terms of institutional challenges. First, there is an urgent need to have a clear policy around targets for blended learning that determines the fit of blended learning within the stated goals and priorities of the institution, faculty, and department (Wallace & Young, 2010). As indicated above, blended learning is not

generally integrated into the strategic plans of the universities. Without a clear vision and action plan, “the movement towards more blended learning opportunities is unfolding in an organic way, rather than an organized way” as noted by the University of Waterloo. This eventually creates the risk of cannibalizing or ineffectively using scarce resources, frustrating users, and generating poor learning outcomes (Wallace & Young, 2010). In a study by Abel (2005), the relationship between having clear policy and success in technology enhanced learning has been clearly demonstrated. His study showed that institutions successful in online learning had compelling reasons to support such learning. Many of these institutional missions were to serve working adults, who have a strong need for more flexibility in receiving effective instruction. Vaughan (2007) suggests developing a policy framework that explicitly states how blended learning supports the vision, values and principles of the institution and includes a set of strategic and operational plans.

The second challenge is the lack of appropriate leadership to support and sustain blended learning initiatives. As York University points out, to ensure the diffusion of innovative practices administrators should be willing to make investments and take risks. Garrison (2011) argues for “collaborative leadership” which pulls together leaders at all levels of the institution to create a real commitment and ownership through a jointly developed vision and plan. Such an approach may dissolve the resistance of the faculty and enhance the adoption of blended learning.

Finally, challenges exist beyond the university. A national policy on the adoption and implementation of blended learning in higher education would facilitate innovations across jurisdictions, and generate savings or other positive outcomes that would strengthen our PSE system.

As education in Canada is a provincial responsibility such developments, although desirable, are extremely challenging. Examples of the success of a national strategy are evidenced in the UK Higher Education Council with the development of blended learning units across the region. The absence of statistical data on blended and online learning within the Canadian higher education context (Bates, 2011) make it difficult to get even an accurate sense of these practices in Canadian institutions.

Conclusion

This report demonstrates that the integration of blended learning at universities is slowly altering higher education in Canada through its potential to offer more flexible, more engaging and more learning centered approaches.

However, successful and sustained integration and uptake of blended learning requires a strategic approach, clear definitions, pedagogical and technological support and dedication of resources and infrastructure.

Without providing a clear understanding of the potential benefits of blended learning in terms of teaching and learning perspectives and supporting both faculty and students to gain required technology literacy, we will continue to see digital technologies used to supplement and duplicate current practices rather than to create innovative practices (Guri-Rosenblit, 2009; Bertrand, 2010). As Renes and Strange (in press) indicate, higher education serves an increasing number of non-traditional students who require increased flexibility. Today's students demonstrate enthusiasm for all sorts of technology to support their complex social and study lives (Jefferies & Hyde, 2010). It is clear from the university responses and existing research that blended learning has an enormous potential to meet the needs of both traditional and non-traditional students. In the USA, an increased awareness of the potential of blended learning and the need to develop a systematic approach to scale-up and sustain innovations were noted in the Department of Education's National Education Technology Plan, 2010.

Two existing collaborations in Canada, Canadian Virtual University (CVU) and Collaboration for Online Higher Education Research (COHERE) have much to contribute to the blended and online agendas in Canadian higher education. These collaborations and networking are essential to share knowledge and experiences and to disseminate innovative practices.

This paper provides a starting point, a glimpse of where we are, and provides suggestions as to how Canadian Universities should and must move forward with this agenda. Clearly, blended learning has great potential: as Young (2002) states, "*The convergence of classroom and online education is the single greatest unrecognized trend in higher education today.*"

References

- Abel, R. (2005). Implementing best practices in online learning. *EduCause Quarterly*, 28(3), 75-77.
- Akyol, Z., & Garrison, D. R. (2011). Understanding cognitive presence in an online and blended community of inquiry: Assessing outcomes and processes for deep approaches to learning. *British Journal of Educational Technology*, 42(2), 233-250.
- Alebaikan, R. & Troudi, S. (2010). Blended learning in Saudi universities: Challenges and perspectives. *Journal of Research in Learning Technology*, 18(1), 49-59.
- Arbaugh, J.B., Godfrey, M.R., Johnson, M., Pollack, B.L. Niendorf, B. & Wresch, W. (2009). Research in online and blended learning in the business disciplines: Key findings and possible future directions. *The Internet and Higher Education*, 12(2), 71-87.
- Bertrand, W.E. (2010). Higher Education and Technology Transfer: The Effects of “Techno Sclerosis” on Development. *Journal of International Affairs*, 64(1), 101-119.
- Bates, T. (2011). *2011 Outlook for Online Learning and Distance Education*. Contact North. Retrieved from <http://www.contactnorth.ca/en/data/files/download/Jan2011/2011%20Outlook.pdf>.
- Collis, B. (2002). *The net as a tool for blended learning. What are the ingredients for success?* Paper presented at Netlearning 2002, November 2002, Ronneby, Sweden.
- Collopy, R.M.B. & Arnold, J. M. (2009). To Blend or Not to Blend: Online and Blended Learning Environments in Undergraduate Teacher Education. *Issues in Teacher Education*, 18(2), 85-101.
- Edginton, A. & Holbrook, J. (2010). A Blended Learning Approach to Teaching Basic Pharmacokinetics and the Significance of Face-to-Face interaction. *American Journal of Pharmaceutical Education*, 74(5), 1-11.
- e-learnspace (2011) Retrieved from <http://www.elearnspace.org/Articles/innovation.htm>
- Garrison, D.R., (2003) University of Calgary Position Paper. Blended Learning Approaches to Teaching and Learning, 2003.
- Garrison, D. R. (2011). *E-Learning in the 21st century: A framework for research and practice* (2nd Ed.). London: Routledge/Taylor and Francis.
- Garrison, D. R., & Vaughan, N. (2008). *Blended learning in higher education*. San Francisco: Jossey-Bass.

Guri-Rosenblit, S. (2009). *Digital Technologies in Higher Education: Sweeping Expectations and Actual Effects*. New York: Nova Science.

Hartman, J. (2010). The Promise and Practice of Blended Learning. Retrieved from <http://hosted.mediasite.com/mediasite/Viewer/?peid=b093b6024bb349feae7ba771bd29d9b61d>

Jefferies, A & Hyde, R. (2010). Building the Future Students' Blended Learning Experiences from Current Research Findings. *Electronic Journal of e-Learning*, 8(2), 133-140.

Laumakis, M., Graham, C. & Dziuban, C. (2010). The Sloan-C Pillars and Boundary Objects in Framework for Evaluating Blended Learning. *Journal of Asynchronous Learning Networks*, 13(1), 75-87.

López-Pérez, M.V., Pérez-López, M.C. & Rodríguez-Ariza, L. (2011). Blended learning in higher education: Students' perceptions and their relation to outcomes. *Computers & Education*, 56(3), 818-826.

Matheos, K., Daniels, B. & McCalla, G. (2005), Dimensions for Blended Learning Technology: Learners' Perspectives. *Journal of Learning Design*, 1(1) Retrieved from http://www.jld.qut.edu.au/publications/vol1no1/documents/dimensions_for_blended.pdf

McGreal, R., & Anderson, T. (2007). E-Learning in Canada. *Journal of Distance Education Technologies*, 5(1), 1-6.

Niemiec, M. & Otte, G. (2010). An Administrator's guide to the whys and hows of blended learning. *Journal of Asynchronous Learning Networks*, 13(1), 19-30.

Ocak, M.A. (2011). Why Are Faculty Members Not Teaching Blended Courses? Insights From Faculty Members. *Computers & Education*, 56(3), 689-699.

Orton-Johnson, K. (2009). I've stuck to the path I'm afraid: exploring student non-use of blended learning. *British Journal of Educational Technology*. 40(5), 837-847.

Owston, R., Wideman, H., Murphy, J. & Lupshenyuk, D. (2008). Blended teacher professional development: A synthesis of three program evaluations. *The Internet and Higher Education*, 11(3-4), 201-210.

Picciano, A. G. (2009). Blended with purpose: The multimodal model. *Journal of Asynchronous Learning Networks*, 13(1), 7-18.

- Renes, S. L. & Strange, A.T. (in press). Using Technology to Enhance Higher Education, *Innovative Higher Education*, Retrieved from <http://www.springerlink.com/content/34ln33362h7l4q0m/>
- Siew-Eng, L., Ariffin, S.R., Rahman, S. & Leong, L.K. (2010). Diversity in education using blended learning in Sarawak. *US-China Education Review*, 7(2), 83-88.
- So, H.-J. & Brush, T. A. (2008). Student Perceptions of Collaborative learning, social presence and satisfaction in a blended learning environment: Relationships and critical factors. *Computers & Education*, 51(1), 318-336.
- Singh, H. (2003). Building effective blended learning programs. *Issue of Educational Technology*, Volume 43, number 6, pp. 51-54
- Sloan Consortium Eighth Annual Conference on Blended Learning Retrieved from <http://www.sonicfoundry.com/webcast/03aebbf-d29c-494f-bf9a-d717ee0816c7.aspx?sm=6Twigg>, C.A. (2003). Improving learning and reducing costs: New models for online learning. *EDUCAUSE Review*, 38(5), 29-38.
- Vaughan, N. (2007). Perspectives on Blended Learning in Higher Education. *International Journal on E-Learning*. 6(1), 81-94.
- Vaughan, N.D. & Garrison, D.R. (2006). A Blended Faculty Community of Inquiry: Linking Leadership, Course Redesign and Evaluation. *Canadian Journal of University Continuing Education*, 32 (2), 67-92. Retrieved: <http://www.extension.usask.ca/cjuce/articles/v32pdf/3223.pdf>
- Vaughan, N. (2010). A blended community of inquiry approach: Linking student engagement and course redesign. *The Internet and Higher Education*, 13 (1-2), 60-65.
- Vaughan, N., Zimmer, J. & Villamar, F. (2011). Student Engagement and Interactive Technologies: What's the connection? *International Journal of Excellence in E-Learning*,
- Wallace, L. & Young, J. (2010). Implementing Blended Learning: Policy Implications for Universities. *Online Journal of Distance Learning Administration*, 13(4). Retrieved from http://www.westga.edu/~distance/ojdl/winter134/wallace_young134.html
- Young, J. R. (2002). 'Hybrid' Teaching Seeks to End the Divide Between Traditional and Online Instruction.
- Zhou, R. & Xie, B. (2010). The educational technology centre: A window to view the progress of Chinese ICT-based higher education. *British Journal of Educational Technology*, 41(4), 642-659.