eLearning TASK FORCE REPORT

UNIVERSITY OF TORONTO
FACULTY OF MEDICINE

The mission of the **eLearning TASK FORCE** is to make recommendations to senior leadership that will position the Faculty of Medicine as a global leader in eLearning (i.e., teaching, learning and scholarship) across the education continuum so that we can provide the best education for today's and tomorrow's learners.

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EXECUTIVE SUMMARY

Over the past decade, eLearning has become an increasingly significant facet of medical, graduate life sciences and health professions education, and has been utilized to varying degrees throughout the medical education continuum.

In 2014, the Faculty of Medicine at the University of Toronto embarked on a reflective and forward-looking exercise to explore the current state of eLearning activities, to chart a path forward to establish the Faculty as a current and future leader in medical education eLearning curricula and technology and to anticipate future technological needs.

The eLearning Task Force, co-chaired by Professors Dimitri Anastakis, Vice-Dean of Continuing Professional Development, and Jay Rosenfield, Vice-Dean of Undergraduate Medical Professions Education, was created to examine and evaluate existing eLearning resources, initiatives and opportunities in the Faculty of Medicine and the broader University to make strategic recommendations. The Task Force gathered information over several months through surveys, focused stakeholder interviews and data collection and analysis, and undertook an internal assessment of eLearning scholarship, resources (including financial, technological, space and human resources), curricula design and implementation, awards, grants and future requirements.

A series of strategic recommendations were developed as a result of this comprehensive assessment, which established a roadmap to advance the Faculty of Medicine at the University of Toronto as a global leader in eLearning across the education continuum. These recommendations cluster around four key themes: **Strategic Planning**, **Faculty Development and Scholarship**, **Funding** and **Infrastructure and Resources**.

RECOMMENDATIONS

STRATEGIC PLANNING

1) Position the Faculty of Medicine to become a leader in eLearning by establishing effective and innovative use of eLearning as a core competence in the delivery of medical, graduate life sciences and health professions education. Create a roadmap for change where inclusion/integration of eLearning becomes the new norm:

   - Position eLearning as a priority in the Faculty of Medicine strategic plan;
   - Establish appropriate and effective use of eLearning as a priority in curriculum development across all education programs;
   - Formalize faculty and staff eLearning positions, including Chairs;
   - Recruit eLearning experts (both faculty and staff);
   - Adjust faculty workload models to incorporate eLearning-related initiatives and teaching activities (i.e., blended workload models);
   - Encourage cross-departmental and interfaculty collaboration;
   - Establish program evaluation systems to monitor effectiveness of eLearning technologies; and
   - Promote excellence in eLearning.

2) Consider both learner preferences and learner readiness for the effective inclusion of eLearning tools to support and enhance learner outcomes in medical, graduate life sciences and health professions education.

FACULTY DEVELOPMENT AND SCHOLARSHIP

3) Establish faculty development programs and just-in-time resources to provide the additional skills and support required of teachers when including eLearning tools and strategies in medical, graduate life sciences and health professions education, including topics such as:

   - Informatics;
   - Technology and software usage;
   - Copyright training;
   - Theory and practice of eLearning scholarship; and
   - Real time support for problems encountered by teaching faculty around eLearning tools/techniques.

4) Support and promote eLearning scholarship.

FUNDING

5) Develop a financial strategy to generate funding to support eLearning in the Faculty of Medicine. This strategy would consider:

   - Commercialization and income generation from education products and services;
   - Advancement and strategic investments (e.g., the creation of an endowed Chair and/or an Extra-Departmental Unit (EDU));
   - Strategic partnerships with the private sector;
   - Cost-sharing models;
   - Realigning existing funds to maximize their impact; and
   - A marketing and brand/reputation management strategy.

6) Provide financial support for eLearning courses, programs and initiatives across the education continuum by:

   - Incentivizing excellence in eLearning within the Faculty of Medicine;
   - Facilitating the advancement of new eLearning programs and tools;
   - Mobilizing resources to fund eLearning and special projects; and
   - Providing sustainability funding.

7) Recognize excellence in eLearning teaching and research through grants, awards and the university promotion process.

INFRASTRUCTURE AND RESOURCES

8) Create a centralized resource (one-stop shop) for learners and faculty where they may seek help, information and advice regarding eLearning. Provide teachers with the technical and instructional design support necessary to effectively implement new and innovative learning strategies and eLearning in their courses through a combination of centralized faculty support services and departmental support, including:

   - Business development and related business services (legal, commercialization, business case development, marketing and reputation management);
   - Production and technical support (information technologies, website production, video production and applications and LMS support);
   - Academic excellence in eLearning (pedagogy design, best practices and community supports); and
   - Dedicated infrastructure (e.g., office space, specialized equipment, etc).

9) Explore and assess the feasibility of reorganizing current Faculty of Medicine resources, such as the Discovery Commons and teaching labs, for the development and support of eLearning initiatives and resources within the Faculty of Medicine.
In the short-term, ensure that future initiatives, such as the Toolbox Renewal Initiative, align with and support future Faculty eLearning directions.

10) Leverage and strengthen relationships by aiming to make efficient use of existing university-wide resources and services, which may include (but are not limited to): library services, the Centre for Teaching Support and Innovation (CTSI) and other faculty and university resources.

11) Establish an eLearning Community of Practice, which would include:

- An eLearning Committee;
- An online platform for information exchange and networking;
- Events designed to network the eLearning community in the Faculty of Medicine and beyond; and
- Events and recognition processes to promote and celebrate accomplishments and achievements.

IMPLEMENTATION PLAN

In order to implement these recommendations, three interdependent, short-term action priorities have been identified: **Leveraging Existing Resources**, **Developing a Centralized Network For eLearning** and **Fostering a Culture Supportive of Innovation**.

LEVERAGING EXISTING RESOURCES

There are extensive potential eLearning resources currently available within the Faculty of Medicine and the broader university; however, they would need to be streamlined and reallocated to be more effective and to maximize impact. To achieve this, the Faculty of Medicine is encouraged to facilitate partnerships and collaborations with University of Toronto units (including the Centre for Faculty Development, i+e and teaching labs) and with hospitals; support the reorganization of Discovery Commons; and realign existing funding sources (including the Education and Development Fund, the Provost's Instructional Technology Innovation Fund (ITIF) and existing education and teaching awards).

DEVELOPING A CENTRALIZED NETWORK FOR eLEARNING

Enhanced institutional support for faculty and staff in eLearning will be vital to the success of future eLearning initiatives, not only by providing specialized support but also by encouraging collaboration and sharing innovations and discoveries. To provide this, the Faculty of Medicine is encouraged to establish a centralized network for eLearning to share best practices, knowledge, resources and tools among faculty and staff; to facilitate collaboration between units and departments; and to help to create an institutional community.

FOSTERING A CULTURE SUPPORTIVE OF INNOVATION

eLearning is a dynamic and evolving field in medical education, and to spark new innovations, faculty accomplishments need to be supported, encouraged and recognized. To increase awareness of the range of possibilities, it will be important to share eLearning strategies that have been successful within our programs and departments, as well as evidence of effectiveness with an end goal of ensuring faculty acceptance and encouraging adoption.

Faculty possess varied attitudes toward the use and proper application of eLearning methods and technologies (Blake, 2009). An innovation-supportive culture could help to promote further faculty engagement in eLearning, thereby cultivating the confidence and skills necessary to implement technology in their every-day teaching practices and potentially help pioneer future initiatives.

In order to facilitate knowledge mobilization, communication will be imperative to create a sustainable institutional culture of innovation where faculty regularly engage in eLearning activities and incorporate eLearning tools and strategies in their teaching. Incorporating eLearning into the Faculty of Medicine's strategic planning will result in a greater importance placed on cultural change, thereby facilitating greater strides in eLearning engagement and implementation (Berge and Mulienberg, 2001). The Faculty of Medicine is encouraged to highlight eLearning as a strategic priority, mobilize start-up funding and incentivize excellence in eLearning by recognizing faculty and staff efforts and achievements and establishing financial awards and grants for excellence in eLearning.

INTRODUCTION

Twenty-first century medical education exists in a digital world. Information technology and eLearning are being translated into medical, graduate life sciences and health professions education curricula in Canada and abroad. The application of technology to teaching, learning and scholarship enables both asynchronous and synchronous learning, and presents new avenues for learners to engage with curricula and each other. By engaging and interacting in a digital environment, learners are largely freed from geographic and time constraints, and are offered new opportunities to develop, communicate and exchange knowledge and skills.

Over the past decade, eLearning has become an increasingly significant aspect of medical, graduate life sciences and health professions education, and has been utilized to varying degrees throughout the education continuum. One of its core strengths is its capacity for customization, allowing it to be adapted to the unique needs of learners across the undergraduate, graduate, postgraduate, continuing education and interdisciplinary portfolios.

While eLearning is becoming increasingly important, it is still a largely developing field–a universally-accepted definition has yet to be established–and the work being done to develop new programs, technologies and content is pioneering. Higher education institutions and medical agencies and organizations are synchronously developing their own eLearning approaches, strategies and initiatives, and as they do so, they are forging new ground. Many divergent and disparate approaches to eLearning implementation and execution are emerging, and while ad hoc partnerships and collaborations do exist between some higher education institutions and medical agencies, there is an overarching trend for organizations to develop tools and approaches independently and without coordination.

It may take many forms and be used in different ways, but at its heart, eLearning integrates education with digital tools and technologies. It presents a tremendous opportunity for innovation, and will play a vital role in the future of medical education. The impact of eLearning extends beyond the conveniences it affords: it is catalyzing a pedagogical paradigm shift that has the potential to foster emergent ways of learning.

The Faculty of Medicine at the University of Toronto (U of T) is the top-ranked medical School in Canada, consistently ranked within the top 25 globally and has one of the largest faculty compliments. In 2014, the Faculty of Medicine embarked on a reflective and forward looking exercise to examine current eLearning activities and strengths at U of T and elsewhere, to identify gaps and challenges, and to chart a path forward to position the Faculty of Medicine as a leader in medical education eLearning today and in the future. An eLearning Task Force was created to help shape the Faculty's role and determine how best to harness U of T's incredible resource of faculty, learners and clinical sites, and to support students' and faculty members' eLearning activities.

Co-chaired by Professors Dimitri Anastakis, Vice-Dean of Continuing Professional

Development, and Jay Rosenfield, Vice-Dean of Undergraduate Medical Professions Education, the eLearning Task Force was created to explore and evaluate the current state of eLearning at the Faculty of Medicine at the University of Toronto, and to make recommendations to advance the university as a global leader in eLearning curricula and technology. (*See Appendix 1 for the Terms of Reference.*) To achieve this, the Task Force had to first develop a definition and framework of eLearning appropriate to the University of Toronto.

Collectively, through a series of consultations and reviews, the Task Force agreed that eLearning is:

an approach to engaging learners within the Undergraduate Medical Professions, Postgraduate Medical Education, Graduate Studies and Continuing Professional Development portfolios. It is a form of education that applies technological approaches to teaching, learning and scholarship, and may include asynchronous and synchronous learning and interactions that assist in the communication of knowledge and skills and their development and exchange.

Having established a definition and framework of eLearning, the Task Force set out to do five things:

1. Evaluate the current state of eLearning at the Faculty of Medicine;
2. Identify key eLearning stakeholders and resources;
3. Align current resources to ensure fiscal sustainability;
4. Highlight trends, gaps and successes within eLearning scholarship across the education continuum; and
5. Identify future needs and to chart advancement in eLearning.

In order to achieve these goals, the Chairs formed four working groups:

- **A.** How and Why;
- **B.** Structure, Finances and Human Resources;
- **C.** Partnerships and Collaboration; and
- **D.** Future State.

Each working group had its own tasks and priorities and was responsible for making strategic recommendations for its subject areas; however, there was significant engagement across working groups.

One of the core strengths of this project was the high degree of collaboration between and among its many stakeholders. The eLearning Task Force's membership was extensive: it spanned all of the portfolios and education units and represented undergraduate, postgraduate, graduate and adult learners. Representatives from the Faculty of Medicine and the wider university community were actively involved across working groups, and included learners, faculty members, administrators, and members of the Ontario Institute of Studies in Education, Biomedical Communications program and the University of Toronto Innovations and Partnerships office. Community stakeholders were also involved in this project, and included representatives from St. Joseph's Health Centre, St. Michael's Hospital and Sunnybrook Hospital. (*See Appendix 2 for the Task Force composition.*)

The Task Force's methodology included gathering information through surveys, data collection and analysis, and focused stakeholder interviews. The Task Force also undertook an internal assessment of eLearning scholarship, resources (including financial, technological, space and human resources), awards and grants, and future requirements, as well as how programs and curricula are being designed and implemented and how eLearning innovations and successes are currently being celebrated. Each of the working groups developed a set of recommendations based on their findings which were then grouped by themes and consolidated. Recommendations were then tallied by the frequency that they appeared to determine priority. The recommendations were also compared to the findings of the literature review to ensure that they were evidence-based. New recommendations were added, as a result, and former ones were revised. (*See Appendix 3 for summary of working group recommendations.*)

Throughout this work, the need for strategic planning was identified as a key priority for the Faculty of Medicine, and three recurring themes (1) Faculty Development and Scholarship, (2) Funding and (3) Infrastructure and Resources emerged from every aspect of the Task Force's work. The thematic organization and analysis within this report and the prioritization of recommendations follow these essential themes for advancing eLearning in the Faculty of Medicine.

In order to make the process as engaging and participatory as possible, the Task Force also shared information in real time through a dedicated website. The eLearning Task Force website represented a significant shift in how and when working group findings could be shared.

This project has been a major undertaking and has resulted in the compilation of a wealth of information and perspectives on how the Faculty should move forward. By working both individually and collectively, the four working groups have constructed a detailed and multifaceted assessment of the current state of eLearning in the Faculty of Medicine.

BACKGROUND

Global adoption of eLearning in higher education has steadily increased over the past decade. This is especially true in the United States, where the population of students enrolled in at least 1 online course has increased at a compound annual growth rate of 16.1%, from 1.6 million students in 2002 to 7.1 million students in 2012 (Allen and Seaman, 2014). This is in comparison to the 2.5% annual growth rate of total student enrollment in higher education during the same time period (Allen and Seaman, 2014). According to the Canadian Council on Learning's 2009 report *State of e-Learning in Canada*, Canada is falling behind in their eLearning achievements when measured against other countries, such as United States, Australia and the United Kingdom. Canada placed 19th out of 154 countries in the 2009 International Telecommunications Union survey—which compares the advanced uses of Information and Communications Technologies (ICT) between countries—falling from 9th place in 2002 (Canadian Council on Learning, 2009). The Economist Intelligence Unit, which conducts a global comparison of ICT infrastructure and the utility of ICTs for economic and social benefit, ranked Canada 12th out of 70 countries in 2008 (Canadian Council on Learning, 2009). This said, Canada still has the potential to be one of the top innovators in eLearning, as it has been praised for its strong telecommunications infrastructure and is in some ways considered a leader in ICT development (e.g., with regards to software, multimedia and wireless technology) (Canadian Council on Learning, 2009).

Commonly used eLearning Tools and Technologies

A literature scoping review was conducted by the Task Force in search of evidence for best practices in eLearning in order to inform the Faculty of Medicine in curricular design and strategic planning. Online learning was the most highly represented in the literature, followed by simulation, multimedia and virtual communities and collaborative learning tools, such as discussion forums. These same eLearning tools and technologies were also among the most commonly reported in use by internal partners at the University of Toronto, with virtual patients being the most common form of simulation technology (Future State Working Group and Partnerships and Collaborations Working Group). The majority of participants from these same working groups mentioned the use of Learning Management Systems (LMS) (e.g., Blackboard) and web-based conferencing technology (e.g., WebEx and GoToMeeting).

A large component of eLearning is online learning, which includes live and webcast lectures, full or partial online courses, online simulation, video, etc (Means et al., 2010). Online learning is praised most for its ability to improve access to learning materials and educational content without the restrictions of time, space or distance (Means et al., 2010). The focus of online learning is to increase the type and number of learning opportunities, enable greater student participation without sacrificing educational quality and enable cost-efficient distribution of learning materials (Means et al., 2010).

While some assert that eLearning's potential benefits are overhyped in the media, it is generally agreed that eLearning is effective in comparison to no intervention, and is at least on par with traditional methods with regard to learning outcomes (Cook et al., 2008; Cook et al., 2010). From an environmental scan and literature review on the impact of online learning on cost, productivity and quality of higher education in Ontario, online instruction was found to be at least as effective as face-to-face instruction (Carey and Trick, 2013). The benefits of online learning were found to be highly dependent upon learner characteristics, such as motivation (Carey and Trick, 2013). In a meta-analysis conducted by the United States Department of Education in 2010 that focused on best practices in online learning, *blended* or *hybrid* learning (in which online and face-to-face instruction are combined) was found to produce better learning outcomes than face-to-face instruction alone (Means et al., 2010). The results suggest, however, that improved learning outcomes may not necessarily be reflective of any inherent benefits of eLearning tools themselves but, rather, may be a consequence of the pedagogical differences associated with blended learning in particular (Means et al., 2010). This is evidenced by the fact that fully online instruction and fully face-to-face instruction have equivalent effects on learning outcomes (Means et al., 2010). Blended learning is said to especially benefit the medical education curriculum —owing to its complexity—which demands a diversity of teaching and learning tools in order to achieve proficiency in the necessary CanMEDS competencies (Cook and Triola, 2014).

The evidence base for eLearning methods and their utility in teaching and learning in higher education is not sufficiently robust at present, and more research is required to elucidate the potential benefits and challenges of eLearning (Cook and Triola, 2014).

Environmental Scan of eLearning Initiatives

The environmental scan reviewed eLearning website content for both Canadian institutions (e.g., Northern Ontario School of Medicine, University of British Columbia, McMaster University) and abroad (e.g., Harvard University, Mayo Clinic, Cleveland Clinic, Monash University, Leiden University) to gather information about strategic plans, content, tools and activities in eLearning. These institutions were chosen for their reputations as being leaders and/or highly engaged in eLearning.

While there was limited website evidence of eLearning as a formal educational strategic direction, there was ample evidence of eLearning leadership, activity and support. A clear eLearning website presence was found at a number of institutions. For example:

- McMaster's machealth website (http://machealth.ca)

  A convenient way for physicians, trainees and other health care professionals and trainees to keep their knowledge and skills up to date through interactive multimedia modules, resources and tools, and discussion forums.

- HarvardX (http://harvardx.harvard.edu)

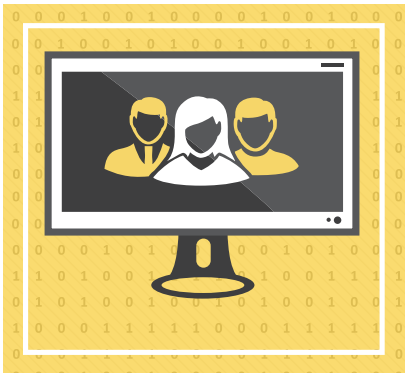
  HarvardX integrates the development of instructional approaches and digital tools across Harvard's campus by providing faculty with pedagogical and research support.

- National University of Singapore (NUS) Centre for Instructional Technology (CIT) (http://cit.nus.edu.sg)

  The CIT drives the use of technology in teaching and learning at NUS by offering a menu of educational technology services such as the Integrated Virtual Learning Environment (IVLE), lecture webcasts and video capture. CIT develops custom courseware to fulfill individual faculty staff's teaching needs and has a multimedia team to provide a full range of audio-visual production services.

These websites, and others, provide faculty and learners with centralized access to the Faculty and/or university's eLearning resources.

eLEARNING TASK FORCE WORKING GROUPS



Individually and collectively, the four Task Force working groups have conducted thematic, high-level SWOT and gap analyses across the Faculty of Medicine.

Each working group's scope, objectives, methodology and findings follow.

A. HOW AND WHY WORKING GROUP

B. STRUCTURE, FINANCES AND HUMAN RESOURCES WORKING GROUP

C. PARTNERSHIPS AND COLLABORATIONS WORKING GROUP

D. FUTURE STATE WORKING GROUP

A. HOW AND WHY WORKING GROUP

(See Appendix 4 for this working group's full report.)

SCOPE

The How and Why Working Group, led by Drs. Jay Rosenfield and Marcus Law, reported on the current integration of eLearning in the Faculty of Medicine, focusing on process, content, design, implementation and platforms. This working group also conducted a scoping literature review, led by Dr. Sue Glover Takahashi, Ms. Laura Leigh Murgaski and Ms. Lisa St. Amant, to allow for evidence-informed recommendations by the eLearning Task Force.

OBJECTIVES

a) Perform an inventory of eLearning initiatives in Undergraduate Medical Professions Education, Postgraduate Medical Education, Continuing Professional Development, Rehabilitation Sciences, Graduate Studies and Faculty Development at the University of Toronto via a Faculty-wide survey.

b) Identify how students and faculty currently use technology (in learning and teaching) and anticipate future needs via learner focus groups.

c) Conduct a scoping literature review to identify key trends, issues, priorities and strategies related to learners, teachers, subject matter and the learning milieu for eLearning across the medical education continuum.

STRATEGY

The working group completed an inventory of current eLearning initiatives across the medical education continuum (e.g., Undergraduate Medical Professions, Postgraduate Medical Education, Continuing Professional Development, Rehabilitation Sciences, Graduate and Life Sciences and Faculty Development) by conducting a faculty-wide survey; identified and assessed barriers to eLearning development; facilitated learner focus groups with participants spanning the medical education continuum; and conducted a scoping literature review of the best practices in eLearning.

A comprehensive search of the literature, particularly a review of articles pertaining to the applications and outcomes of eLearning for education, was conducted using the scoping review methodology outlined by Arksey and O'Malley (2005). Schwab's algorithm (Schwab, 1973) was used in this eLearning scoping review to consider the insights each review article provided about learners, teachers, subject matter and eLearning tools and strategies.

RESULTS

I) SURVEY

Faculty active in eLearning resource and program development from across all departments in the Faculty of Medicine were targeted for recruitment to complete the survey. The recruitment pool also consisted of referrals provided by the target group. The overall survey response rate was 45%. The Departments of Medicine (24%), Anesthesia (14%) and Family Medicine and Community Medicine (14%) were the top three most represented departments in the survey.

FINDING

Faculty Members' Perspectives on the Utility of eLearning in Enabling Teaching

Overall, faculty responded very positively to questions regarding the perceived effectiveness and utility of eLearning resources and technology in providing for student's learning needs and for improving teaching quality and teacher experience. Most respondents (87%) indicated that the use of eLearning has made teaching more interesting and that it has increased their satisfaction as a teacher (82%).

In addition, most faculty member respondents are confident using eLearning in their teaching (87%) and feel that eLearning has improved their teaching effectiveness (76%). eLearning is also said to facilitate greater student interaction (69%) and allows for content and methods of delivery to be tailored to students' individual needs (82%).

eLearning modalities were most highly ranked for their ability to enhance teaching, with tablets, smart phones, and Learning Portal (Blackboard) course tools ranked as having the greatest utility.

TABLE 1. FACULTY MEMBERS' PERCEIVED UTILITY OF eLEARNING TOOLS AND TECHNOLOGIES IN ENABLING TEACHING

TYPE OF eLEARNING TOOL	MOST HIGHLY RATED TOOL FOR UTILITY IN ENABLING LEARNING	LEAST HIGHLY RATED TOOL FOR UTILITY IN ENABLING LEARNING
eLearning Modalities	Tablets	Avatars
Social Media Modalities	Media Sharing (e.g., YouTube, Flickr)	Facebook
Conferencing and Communication Tools	Web-based video conferencing (e.g., Adobe Connect, WebEx, Skype, Facetime, Ontario Telemedicine Network)	Snapchat

** Refer to How and Why Working Group Report for further details.*

FINDING

Current eLearning Initiatives in the Faculty of Medicine

The vast majority of eLearning resources mentioned by respondents (68%) were developed within the past 5 years (from 2010 up to and including 2014), with 51% having been developed in the last 3 years (from 2012 up to and including 2014).

The target audience for most of these eLearning resources are students in undergraduate medical education (62%), followed by those in postgraduate medical education (52%) and multidisciplinary health professions (41%). Most eLearning resources being developed are either in the form of courses or modules (54%), and all of the resources mentioned have an online component.

Eighty-six percent of respondents who have created eLearning resources have presented them at the departmental, hospital, university, provincial, national and/or international level.

Notable examples of eLearning initiatives developed by Faculty of Medicine faculty include:

- An anatomy glove learning system developed to teach residents the three-dimensional structure and function of the hand (Department of Surgery);
- A digital pathology archive that contains an extensive archive of whole slide images, along with their respective clinical information (Department of Laboratory Medicine and Pathology);
- An interactive, web-based pediatric rheumatology resident teaching module –Pediatric Online Interactive Teaching in Rheumatology (POINTER)–that incorporates patient cases, simulation training and online resources (Department of Paediatrics); and
- A web-based Virtual Interactive Case (VIC) system used for assessing resident competency in clinical reasoning (Department of Anesthesia).

FINDING

Infrastructure for Integration and Development of eLearning Resources

Issues pertaining to infrastructure, such as lack of funds, resources, support and time, were commonly cited as being barriers to eLearning development and to sustaining innovation in general. Faculty reported a lack of skilled labour with the ability to work with software, assist in the development and maintenance of resources and provide technology support. Funding for eLearning initiatives, however, was the most pressing issue mentioned by faculty.

The majority of faculty report that they rarely receive grants (65%) and/or financial support from the university or university department (66%). Faculty from the Departments of Pharmacology and Biochemistry reportedly receive greater university-level support than the other departments surveyed. An even greater percentage of respondents reported that they rarely receive financial support from their hospitals for eLearning projects (79%).

With the exception of respondents from the Department of Physiology, faculty members are not receiving income for their resources. While 45% of faculty responders reported to not have trouble sustaining their innovations past the pilot phase, they identify themselves to be the primary developers, maintainers and financers of their eLearning projects. Seventy-nine percent of respondents reported that they develop their eLearning resources themselves either "some, most" or "all of the time." A possible explanation for this is there is a lack of protected time for developing materials, as some participants have stated. Most faculty members claimed to work on eLearning initiatives during either their personal time or regular working hours. Sixty-two percent of respondents reported that they are responsible for the maintenance of eLearning resources either most or all of the time. Seventy-three percent of faculty report that they self-fund their eLearning projects "some, most" or "all of the time."

II) LEARNER FOCUS GROUPS

The How and Why Working Group commissioned learner focus groups to be conducted by Paula Veinot to explore perceptions and opinions about eLearning, which included concerns or perceived challenges and suggestions as to how eLearning, in the Faculty of Medicine, might be improved. (*See Appendix 5 for the full Learner Focus Group Report.*)

Sampling and recruitment for the learner focus groups involved targeted recruitment from various Faculty of Medicine programs, including Undergraduate Medical Education, Postgraduate Medical Education, Physician Assistant, Physical Therapy, and Radiation Therapy. Faculty learner participants were from Occupational Science and Occupational Therapy, Physical Therapy, Laboratory Medicine and Pathobiology and Medicine.

FINDING
FOCUS GROUP THEMES

The following themes were identified:

- General acceptance that eLearning is the way of the future.
- Learners valued eLearning that functioned, was accessible and improved their learning.
- For the majority of the participants, there seemed to be a tacit acceptance that this pedagogical technique was helpful when done well (purposefully and effectively), from each learners' notion of what is important them, underscoring the need for high quality and well organized offerings with incremental change for content that fits an eLearning approach.
- eLearning modalities were considered to have educational value while social media was viewed as having a communication and entertainment purpose.
- Providing personalized learning to optimize the relevance of content, further emphasizes the importance of accessibility. Personalized or customized learning means providing content via various platforms.

In the faculty learner group, accessibility was raised in the context of providing templates and low cost options, and accommodating the range of skill levels (e.g., community of practice for new users and advanced skills development for those more comfortable using eLearning).

- The education of faculty, as well as the training of students, about how to use technology was discussed both by students and trainees and by faculty learners.

Students in programs that fully adopted eLearning (i.e., Physician Assistant Program and Physical and Radiation Therapy) seemed to particularly like the eLearning approach.

Accessibility was a key theme across all learners, including cross-machine/platform use, low cost options and availability of multiple methods.

A range of perceived barriers and disadvantages were captured during the learner focus groups and include:

- Costs;
- Acceptance (comfort and interest);
- Technology limitations;
- Poorly designed (validity and reliability); and
- eLearning Methods.

III) LITERATURE SCOPING REVIEW

(See Appendix 6 for the full review.)

The proportion of articles reviewed belonging to each finding is listed in brackets, where appropriate.

FINDING

1. Learners in medical and health professions education benefit from the inclusion of effective use of eLearning tools and strategies with evidence of better learning outcomes than with solely didactic methods and/or with no intervention.

1.1 In the majority of the literature reviewed (61%), eLearning was evidenced to improve learning outcomes in comparison to didactic methods and/or to no intervention. This is in comparison to 22% of articles that observed equivalent outcomes and 6% that observed inferior outcomes, in comparing certain eLearning tools (some under certain contexts) to didactic methods.

i. Of the articles that observed equivalent outcomes, 2 were related to multimedia, primarily with regard to the use of both animation and virtual slides; 2 compared virtual patients to live patients; 1 was related to electronic Continuing Learning (e-CE); 1 was related to video-conferencing; 1 was related to social media; and 1 was related to eLearning in general.

ii. All reviewed literature that observed inferior outcomes were about animation. One gave evidence of poorly developed psychomotor skills with the use of animation, and 1 stated that animations can result in decreased learning, depending on the activity depicted, level of realism and content domain.

1.2 The majority of articles discussed improvement in learning outcomes with regard to simulation (36%). Types of learning outcomes that improved as a result of simulation included procedural skills, clinical skills and knowledge.

1.3 When used, eLearning has resulted in greater improvements in learning outcomes overall (28%), and more particularly, in knowledge acquisition (17%) and in clinical skills and clinical reasoning (14%), in comparison to didactic learning alone and/or to no intervention.

1.4 Learners can benefit from improved access to materials (17%) and, therefore, greater flexibility in learning (17%) by using eLearning tools and strategies.

i. Enabling distance learning and asynchronous use of eLearning tools to learn or review is a prime example.

1.5 eLearning tools and strategies were reportedly advantageous as they can be employed to suit different learner needs.

i. The use of multiple educational tools permits diversity in delivery medium, application, context, etc for greater suitability to different learner needs and preferences (6%).

FINDING

2. Consideration must be given to both learner preferences and learner readiness for the effective inclusion of eLearning tools and strategies to support and enhance learning outcomes in medical and health professions education.

2.1 The utility and effectiveness of eLearning is highly dependent on learner characteristics and needs including: knowledge base, spatial abilities, training level, specialty and interests (25%).

2.2 Learners reported that they prefer eLearning tools and strategies that enhance interaction and engagement.

2.3 Some studies noted that eLearning was hampered by learners who were reluctant or who declined to engage in eLearning.

2.4 Learners' readiness includes understanding learner motivation, resistance and requisite eLearning literacy skills for engagement and success.

2.5 Timely learner support is central to successful inclusion of eLearning tools and strategies.

FINDING

3. The reviews offered surprisingly little helpful information about the role of teacher as designer of eLearning or best practices on use of eLearning but did report on the additional skills and efforts required of teachers for the effective inclusion of eLearning tools and strategies in medical and health professions education.

3.1 Teachers need eLearning literacy skills (14%).

3.2 Teachers need to be equipped and/or have resources to support learners in solving technical problems encountered in the use of eLearning (14%)

3.3 Using eLearning tools and strategies is reported to save time, in general, (17%) but some tools, such as social media, require additional time for teachers (6%).

3.4 Teachers will need to manage a range of learner motivation, resistance and requisite eLearning literacy skills for engagement and success (11%).

3.5 The application of eLearning tools and strategies requires teachers to "wear many hats", in that their roles and responsibilities differ both between tools and strategies used and between eLearning and traditional education methods (11%).

FINDING

4. The educational benefits of eLearning tools and strategies in medical and health professions education need to be broadly considered, carefully employed and consistently evaluated to ensure the anticipated educational goals and learner objectives are achieved.

4.1 'Proven-to-be-effective' eLearning tools and strategies should be the included into traditional educational model/ curriculums for both the learning and assessment value they provide to meeting educational goals and learner objectives (33%).

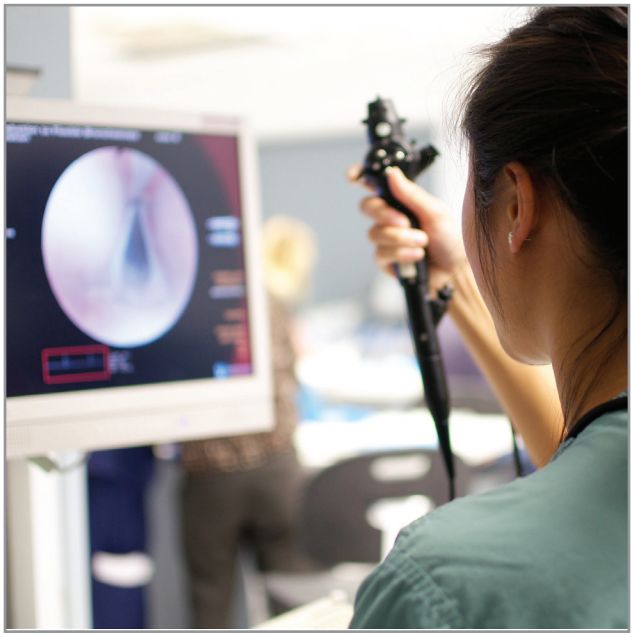
4.2 The costs of eLearning tools and strategies need to be balanced by the noted available benefits; for example, managing risk and patient safety, reducing length of training, mitigating reduced work hours, limiting or limited clinical site time (11%).

4.3 Where possible, eLearning should be used when it offers cost-efficiencies, improved learner access or lightens the teacher's role (8%).

4.4 eLearning tools and strategies can be used to permit faculty to focus on achievement of performance and/or performance in the clinical setting after achieving requisite knowledge, skills via eLearning (8%).

FINDING

5. Both in the general use and the specific employment of eLearning tools and strategies, the following factors must be carefully considered to determine best 'match' for medical and health professions education:



5.1 Learner characteristics

- i. i.e., learner backgrounds, needs and preferences
- ii. e.g., motivation, prior knowledge, spatial ability, training level and individual competencies;

5.2 Teacher characteristics

- i. i.e., teacher backgrounds and resources
- ii. e.g., degree of competency in use of hardware and software, support for innovation; and

5.3 Aims of education

- i. e.g., distributed education, improved access and asynchronous learning.

B. STRUCTURE, FINANCES AND HUMAN RESOURCES WORKING GROUP

(See Appendix 7 for this working group's full report.)

SCOPE

The Structure, Finances and Human Resources Working Group, led by Dr. Dimitri Anastakis, Dr. Heather MacNeill and Ms. Kim Moran was created with the intent to better understand the financial investment in eLearning across the Faculty of Medicine and to identify opportunities for the coordination of resources.

OBJECTIVES

a) Examine resources to identify staffing/ faculty positions dedicated to eLearning and/or Technology.

b) Trace/audit project funding, grants and awards allocated to eLearning projects and development.

c) Review departmental infrastructure allocated to eLearning.

d) Identify strategic priorities for and future requirements of implementing eLearning. Identify opportunities to grow eLearning given current fiscal environment.

STRATEGY

The working group completed an inventory of existing strengths, weaknesses, opportunities and threats; disseminated a Faculty-wide eLearning survey; examined current space allocated for eLearning (e.g., simulation spaces and computer labs); and completed an inventory of available grants and awards established to celebrate and support the development of eLearning initiatives.

RESULTS

I) SURVEY

All individuals in positions of leadership from across the Faculty of Medicine (Deans, Vice-Deans, Chairs, Department Heads, etc) were invited to complete a survey to gain a better understanding of the supports in place for eLearning initiatives. The overall response rate was 24% (note: many more people opened the survey, but did not complete it, likely because it was not applicable to them). The top three departments represented in the survey were Medicine, Family and Community Medicine and Pediatrics at 17%, 12% and 10% of the respondent population, respectively.

FINDING
FORMAL ROLES IN eLEARNING

One of the areas of inquiry for the Structures, Finances and Human Resources survey was regarding faculty and staff involvement in eLearning. Seventeen departments and/or programs responded that they have positions dedicated to eLearning engagement in some capacity. The 17 units were contacted to seek additional information, yielding 9 responses. Eight of these identified having 1 staff member within the unit who supports eLearning in some way, primarily in an informal, part-time and largely ad hoc capacity. Two of the 9 positions were described as full-time and solely dedicated to eLearning development; the other 7 support eLearning in concert with other non-eLearning responsibilities.

The 2 full-time staff positions solely dedicated to eLearning required specialized skills pertaining to eLearning (i.e., content development, module creation, technology development, etc). eLearning staff in the other 7 units were program, project and IT assistants who provide support with online learning or content management systems, video production, website management and/or blogs. One unit indicated that a new eLearning staff position is currently being created.

From the 9 responses received, eLearning staff support appears to be largely ad hoc and comprises only part of staff job descriptions. More information on faculty engagement and the potential for enhanced, specialized eLearning staff support positions could be explored in the future.

FINDING
FINANCIAL SUPPORT FOR eLEARNING INITIATIVES

From the survey data, there appears to be a lack of funding and resources (such as skilled labour, time, and equipment) for both professional and program development in relation to eLearning across all departments. Some individuals even reported having to use personal funds for eLearning initiatives, while others stated that eLearning is not a priority in their program or department.

Seventy-one percent of faculty surveyed said that their program, department or portfolio does not generate income from eLearning products and/or services. Only respondents from the Departments of Anesthesia, Biochemistry, Pediatrics and Psychiatry reported having generated income. For those that do generate income from eLearning products and/or services, the majority (56%) report facing barriers to doing so. Common barriers cited by faculty were resource limitations, limited faculty time and skill, and copyright and intellectual property issues.

Sixty-one percent of respondents stated that they do not receive major grants for eLearning projects, programs and/or application development. From the inventory of available grants and awards conducted, the Department of Medicine was found to hold the most Education Development Funds explicitly related to eLearning, yet only 20% of Medicine respondents reported having received major grants for eLearning.

II) INVENTORY OF GRANTS AND AWARDS FOR eLEARNING

FINDING

AWARDS AND DEPARTMENTAL FUNDING

Overall, there are presently very few opportunities for faculty members to gain recognition or funding for eLearning initiatives. Outside of the use of operating funds, there is no indication that Departments have dedicated funds or competitions in place to allocate funding for eLearning initiatives.

While Departments offer numerous awards for merit, only 1 has an internal award specific to eLearning (the Fred Fallis Award, which was awarded in 2011, 2012 and 2013, to recognize an individual or group that has demonstrated innovation and excellence in online learning for health professionals).

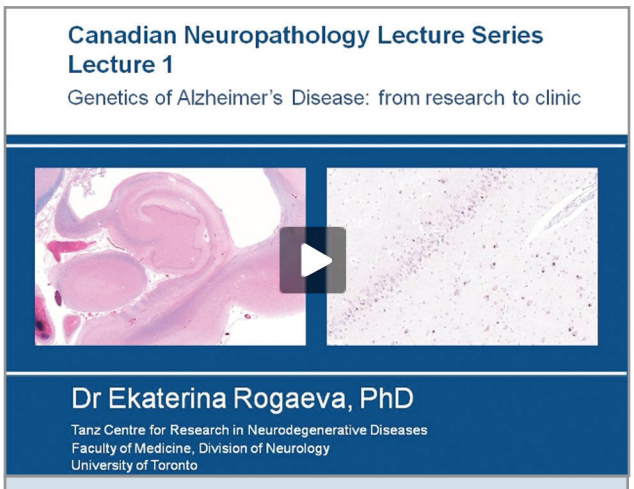
Since 2011, at least 7 internal Faculty awards have been granted to recognize or support eLearning initiatives. Faculty members and initiatives can also be recognized via external awards, but often external awards criteria are broad and designed to recognize sustained excellence, career awards and clinical teaching and instruction, rather than eLearning initiatives and innovations.

Since 2009, faculty members have submitted at least 9 external awards to recognize an individual's or group's contributions to eLearning; at least 1 was successful.

In 2009, Dr. Lynn Russell, Dr. Catherine Smith, Dr. Leila Lax, and Ms. Laura Jayne Nelles won the AFMC John Ruedy Award for Innovation in Medical Education for their development of the Communication and Cultural Competence Program.

FINDING
EDUCATION DEVELOPMENT FUND

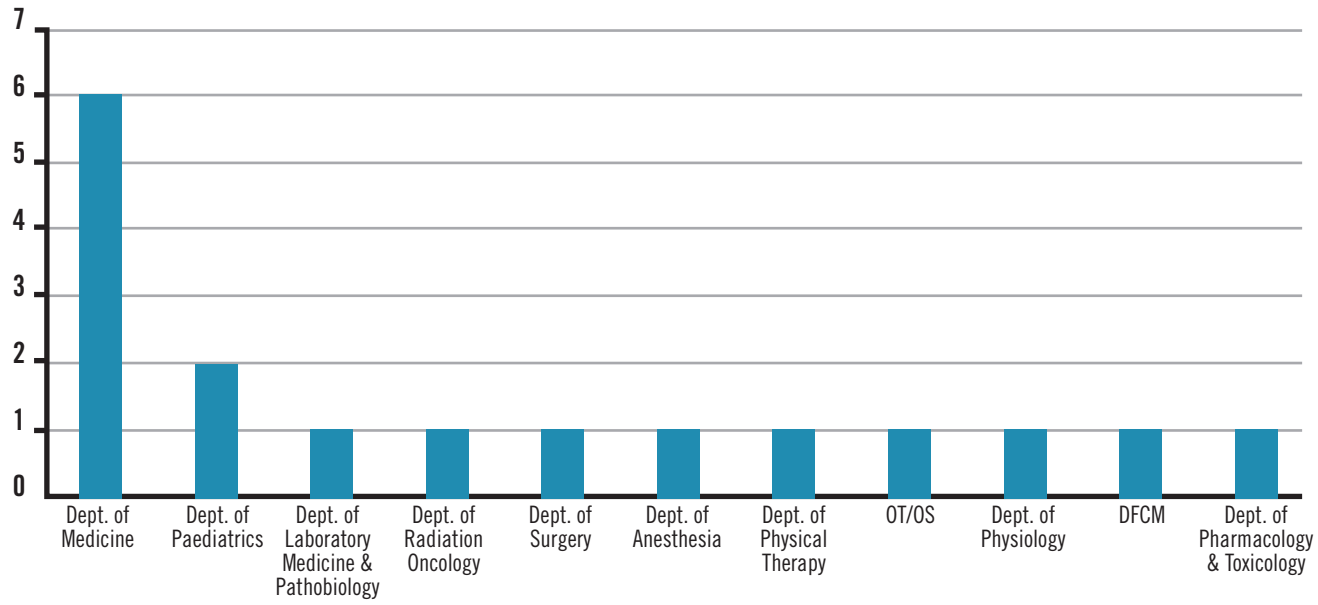
Since 2009, the Faculty has invested $124,068.20 to fund 17 EDF projects explicitly related to eLearning and those with the potential to impact future eLearning initiatives (including projects involving simulations, videos and the exploration of multimedia curricula and teaching tools). EDF criteria stipulate that the applicant(s) home department provide matched funding support for the project; therefore a total of $248,136.40 has been invested over five years. Within the same time frame, approximately 21 projects eLearning specific or related to eLearning have gone unfunded. Funded EDF projects are primarily related to high fidelity simulation, multimedia, multi-mode and/or are explicitly eLearning.



National neuropathology lecture series: Collaborative inter-professional elearning for a small specialty

Enveloping anatomy learning system (Anatomy glove and video)

Number of EDF Grants by Department 2009-2014

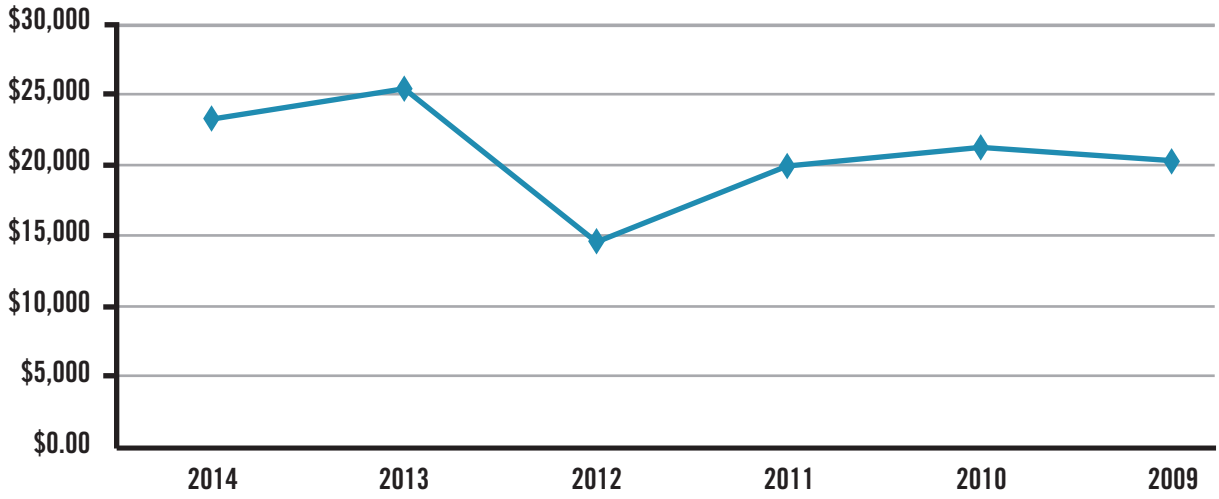


$124,068.20 total funding represented in this graph but does not include 1:1 departmental match

* *Includes 17 projects funded between 2009 and 2014, explicitly related projects and those with the potential to impact future eLearning initiatives, including projects involving simulations, videos and the exploration of multimedia curricula and teaching tools.*

* *Department of Medicine includes the Division of Emergency Medicine.*

Total eLearning-related EDF Grants by Year 2009-2014



THE EDF PROJECTS LISTED BELOW REFLECT HIGH FIDELITY SIMULATION, MULTIMEDIA, MULTI-MODE AND/OR ARE EXPLICITLY eLEARNING:

2014

- The creation of a web-based learning module for indigenous health education
- Development of an introductory eLearning course on clinical research methods and quality improvement for the Toronto-Addis Ababa Academic Collaboration
- High-fidelity elearning to support competency-based residency training

2013

- Online interactive modular course for inter-professional and continuing education in sleep health
- Creation and use of animation in teaching pharmakinetic and pharmadynamic principles
- National neuropathology lecture series: Collaborative inter-professional elearning for a small specialty
- Development of a newborn lung simulation model as an educational tool for mechanical ventilation for residents and fellows

2012

- Designing an interactive video tool (iVT) to enhance integration of basic and clinical sciences in the analysis of movement challenges in persons with neurological impairments
- Assessment of the construct validity of virtual interactive case (VIC) scores in family medicine virtual patient cases scores in family medicine virtual patient cases part 1: Usability

2011

- Developing interactive animations of key physiological processes to enhance student competency
- Hinting strategies for improving the efficiency of medical student learning of deliberately practiced web-based radiographs

2010

- Is a multimedia-based teaching tool as effective as bedside teaching? Proposal for a validation study
- The impact of simulator based education on the acquisition of life-saving airway procedure – Role of a specialized hybrid-high fidelity patient simulator model
- Team training for trauma (3T): Developing an interdisciplinary, simulation based human factors training curriculum for general surgery residents

2009

- The utility of e-portfolios for documentation and evaluation of the CanMEDS scholar domain in general medicine and rheumatology postgraduate medical education
- Enveloping anatomy learning system (Anatomy glove and video)
- Does the use of procedure videos during clinical shifts improve the quality of teaching of procedures in the emergency department?

FINDING
INSTRUCTIONAL TECHNOLOGY INNOVATION FUND

The Provost's Instructional Technology Innovation Fund (ITIF) (previously called the Instructional Technology Courseware Development Fund or ITCDF) is a seed fund designed to catalyze initiatives that immediately and directly impact University of Toronto education and teaching programs through innovation and development. It is funded by the Provost and administered by Academic and Collaborative Technologies, a partnership between the Centre for Teaching Support & Innovation and Information Technology Services. The ITIF is focused specifically on the practical applications of technology in design, implementation, evaluation, curriculum renewal, faculty development or continuing education initiatives that enrich learning. The ITIF is intended to support strategic directions in education broadly, across all disciplines. The proposed deliverables and outcomes must be closely aligned with the ongoing goals and objectives of the departments and programs from which they emerge.

III) INVENTORY OF SPACE ALLOCATED FOR eLEARNING

FINDING
eLEARNING SPACE

A total of 18 departments, divisions and programs were inventoried for institutional space allocated to eLearning. Based on this inventory, there is a total of 2,250 m^2 of space dedicated to eLearning, the majority of which is dedicated to research lab space (23%), scheduled class labs (18%), study space not under library jurisdiction (18%) and research lab support space (12%).

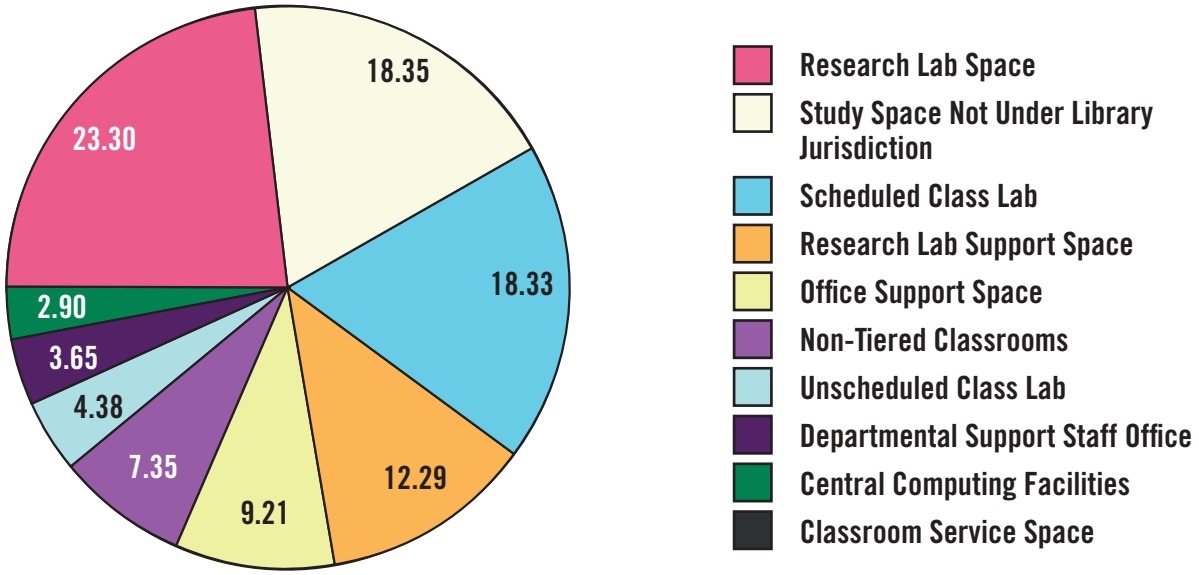
eLearning space for undergraduate medical education was found to surpass that of postgraduate medical education (232 m^2 compared with 9 m^2). This may be in line with other institutions, both nationally and internationally, as indicated by participants from the Future State Working Group, who detailed a greater use of technology in Undergraduate Medical Professions Education than in Postgraduate Medical Education. This assymetry is unsurprising given the clinical, hospital-based nature of postgraduate medical education generally.

The Discovery Commons was found to have the greatest area of space allocated for eLearning (361 m^2), as might be expected, since it is the Faculty of Medicine's information technology support unit. Most of this space is dedicated toward Scheduled Class Labs. As such, the Medical Sciences Building has the greatest space allocation for eLearning (927 m^2).

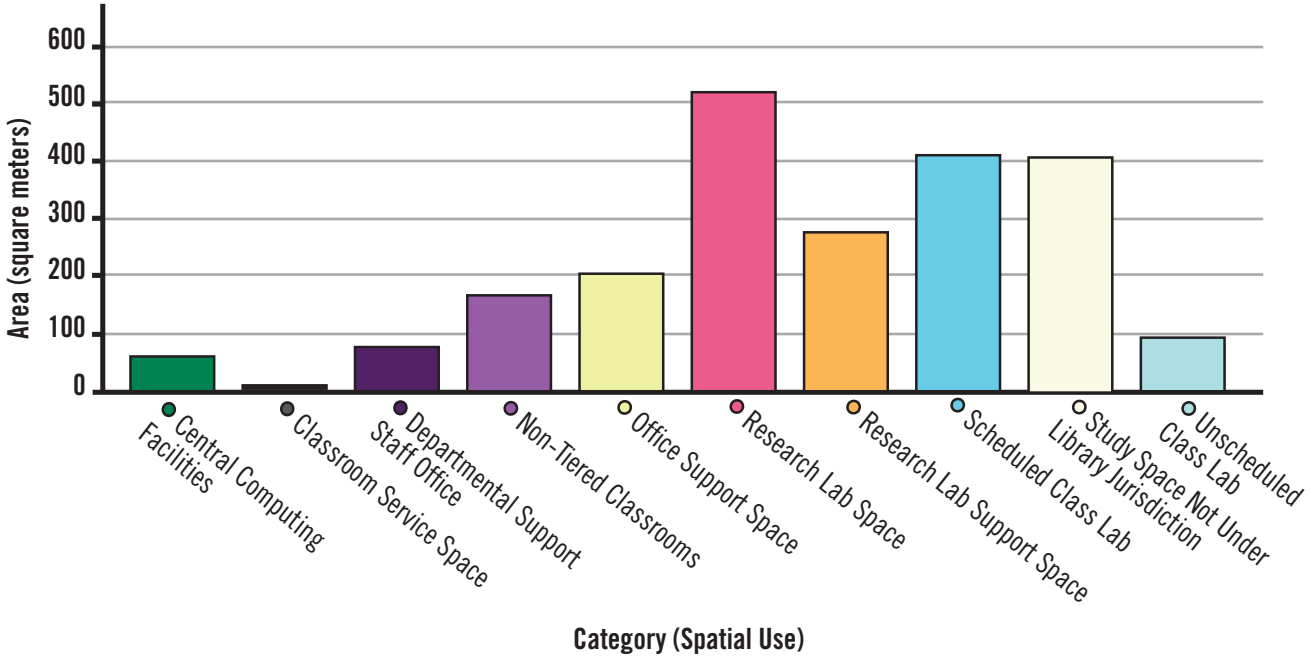
The Department of Physical Therapy and Rehabilitation Sciences sector also have considerable eLearning space with 352 m^2 (primarily research lab spaces) and 335 m^2 (primarily for study spaces), respectively.

Faculty of Medicine staff members appear to be unaware of the eLearning space available to their departments, divisions or programs. The majority of survey respondents (78%) said that they do not have dedicated eLearning space. Some of the departments with the greatest space allocation for eLearning did not respond to the Structure and Finances Working Group's survey question on space dedicated to eLearning. This may be indicative of a general lack of awareness of the resources available for eLearning and/or what staff and faculty perceive as constituting eLearning space.

Percent Distribution of Area Dedicated to eLearning by Category



Area Dedicated to eLearning by Category



C. PARTNERSHIPS AND COLLABORATIONS WORKING GROUP

(See Appendix 8 for this working group's full report.)

SCOPE

The Partnerships and Collaborations Working Group, led by Drs. Peter Azmi and Avi Hyman, was developed with the intent to look closely at internal and external strategic initaitives directed at the sharing of eLearning tools, research and development and best practices.

OBJECTIVES

Identify, through structured stakeholder interviews:

a) Present internal collaborations within Faculty of Medicine departments and Education Units;

b) Existing collaborative eLearning initiatives with external stakeholders/ partners; and

c) Risks and opportunities.

STRATEGY

The working group facilitated focused structured interviews with internal and external stakeholders; conducted an inventory of current eLearning offerings across the Faculty of Medicine; and sought to identify new and innovative opportunities for collaboration.

A total of 9 interviews were conducted, 5 with internal partners and 4 with external partners. A summary of the participants is provided on the following page.

Internal Partners

Department/ Division/ Institute /Program	Campus	Contact	Position(s) / Role(s)
Faculty of Medicine	St. George Campus	Chris Perumalla	Director of the Division of Teaching Laboratories
Centre for Teaching and Learning	Scarborough Campus	Janice Patterson	Associate Director of Communications, Events and Grants
OISE	St. George Campus	Kurt Binnie	Director of Information Technology
Hazel McCallion Academic Learning Centre	Mississauga Campus	Simone Laughton	Instructional Technology Liaison
Faculty of Applied Science & Engineering	St. George Campus	Susan McCahan	Professor and Vice-Dean, Undergraduate

External Partners

Company/ Organization	Contact	Role
Pearson Canada	David Roker	Director of Media Production
CoursePeer Inc.	Hadi Aladdin	Co-founder and CEO
John Wiley and Sons	Maureen Talty	General Manager, Global Education Canada
Apple	Philip Hume*	Account-Executive, Higher Education
Apple	Willi Powell*	Strategic Development Manager

**participated in the same interview session*

RESULTS

I) INTERNAL PARTNER INTERVIEWS

FINDING
DEFINING eLEARNING

All internal partners agreed that eLearning is the application of technology to teaching and learning; however, perceptions on the types of technologies and strategies that eLearning encompasses varied greatly between respondents. eLearning pedagogy and comparisons to traditional learning methods are absent from the discussion and understanding of eLearning. This may indicate that eLearning is not perceived to require different instruction methods than are used in traditional education. This is also observed in the literature, as David Cook and Furman McDonald state that eLearning technology borrows from the educational methods of traditional instruction (2008).

FINDING
USES OF eLEARNING TOOLS AND STRATEGIES

eLearning modalities (such as CoursePeer, Peer Scholar and simulation technology), multimedia (such as animation) and Learning Management Systems were the most commonly used eLearning tools and technologies by internal partners. A variety of eLearning strategies are employed by internal partners, such as blended learning, flipped classroom and MOOCs. eLearning is used in learner assessment, class presentations and distance learning and to facilitate learner collaboration, among other functions.

FINDING
INTERNAL AND EXTERNAL COLLABORATIONS

All of the internal partners interviewed have been involved in collaborations to varying degrees, most of which encompassed the development or evaluation of eLearning tools, technologies, courses, applications and/or modules.

List of Internal Collaborations

(non-exhaustive)

- Academic Skills Centre
- Career Centre
- Centre for Teaching Support and Innovation
- Classroom Technology Support
- Discovery Commons
- Faculty of Information
- Information & Instructional Technology Services (UTM)
- Information Technology, Department of
- Leslie Dan Faculty of Pharmacy
- Music, Department of
- Physical Education, Department of
- School of Continuing Studies

List of External Collaborations

(non-exhaustive)

Academic

- International institutions (France, Germany, Japan and U.S.)
- Michener Institute
- University of Waterloo

Industry

- Commoncraft
- Coursera
- Noldus
- Quasner
- Studiocode
- Xtranormal

Government

- Ministry of Education
- Ontario Provincial Government

Other

- EDUCAUSE
- EdX

The University of Toronto Mississauga campus (UTM) library (Hazel McCallion Academic Learning Centre) and the Ontario Institute for Studies in Education (OISE), in particular, have had several collaborations between departments, campuses, international institutions, industry and government.

OISE has partnered with the Ministry of Education in building the Ontario Education Resource Bank (OERB), a repository containing free digital learning resources for teachers and students (Ontario Ministry of Education, 2013). The resources are created by teachers, align with the Ontario curriculum and have been designed for use in primary and secondary education. OISE has also collaborated with the Departments of Music and Physical Education, having built an online solution to manage teaching assistant job postings for the former and developed an educational mobile application for the latter. They have also partnered with the First Nations House (FNH) and Promising Practices in Aboriginal Education, the latter of which is supported by the Martin Aboriginal Education Initiative (MAEI) in establishing the Deepening Knowledge Project (University of Toronto OISE, 2014). This project aims to incorporate Aboriginal history and knowledge into higher education. OISE has helped to create an online Aboriginal education curricula database to this aim that includes various online resources (web sites, audio and video resources, etc).

UTM has collaborated with the UTM Information & Instructional Technology Services (IITS) in providing faculty training and support and in composing instructions for the use of the platform UTM Submit. They were also involved in the development of software for the student assessment data collection and management tool Scantron. UTM has also has numerous research collaborations with the Centre for Technology Support and Innovation (CTSI), OISE, iSchool and researchers at the UTSG and UTSC to evaluate the effectiveness of different educational and administrative technologies in use at the University of Toronto.

Other examples of collaborations with internal partners include:

- The Faculty of Applied Science & Engineering (FASE) has collaborated with both EdX and Coursera in developing Massive Open Online Courses (MOOCs).
- The Active Learning: Online Redesign (ALOR) Project is a collaboration between the Departments of Psychology (UTSC), Language Studies (UTM) and Material Science (FASE), the Health Systems Leadership and Administration Program (Faculty of Nursing) and the Human Biology Program (FAS), which aims to enhance the educational curriculum through increased access to online active learning opportunities (University of Toronto Online Learning, n.d.).

FINDING
INSTITUTIONAL SUPPORTS FOR eLEARNING

Internal partners reported that a better infrastructure is needed to support the use of eLearning in educational practices. Funding is needed for research and development of eLearning technology and the institution would benefit from generating greater awareness of funding opportunities for eLearning.

A centralized network for eLearning was proposed to create an institutional community where best practices, knowledge, and resources are shared among staff and faculty. Through collaboration, efforts could be focused on common goals, instead of having many people working on the same issues in parallel.

Other needs mentioned were providing faculty with technologies that have already been proven to be effective (e.g., for ease of integration with other tools in use by the institution, and for their effectiveness in teaching and learning), and a more flexible Learning Management System.

II) EXTERNAL PARTNER INTERVIEWS

FINDING
BUSINESS MODELS AS THEY RELATE TO HIGHER EDUCATION

All four external partners interviewed stated that education-based assets are an important component of their business

model, if not crucial. External partners' involvement in higher education includes creating, providing and distributing content, systems and technology for academic institutions. The partners interviewed all offer the opportunity for customized educational solutions, enabling institutions to choose the most effective strategies for their courses and/or programs and to regulate partner involvement in educational initiatives to suit their specific needs. External partners from John Wiley & Sons and Pearson Canada spoke of their need to adapt to the increasing integration of technology in education by offering digital resources. The interviewee from Pearson Canada stated that by 2015, 70% of their revenue will be generated through digital resources. As a consequence of this educational transformation, students are said to have greater "power in diving adoption decisions" (Pearson Canada).

Most external partners interviewed indicated that their partners generally provide their own content, while John Wiley & Sons explicitly mentioned that they also create and provide content for their partners.

FINDING
IMPORTANCE OF EVALUATING PRODUCT EFFICACY

External partners noted efficacy of eLearning products as an integral component of their business agenda, expressing the need to be able to demonstrate that their products have a lasting impact. Hence, an important role of academic institutions in partnering with these companies is in helping evaluate the efficacy of their resources, by tracking and monitoring student progress, for example.

FINDING
ADVANTAGES OF FORMING PARTNERSHIPS

The most commonly mentioned advantages of forming partnerships were to facilitate course and program development, marketing and/or administration; for greater assurance of and access to effective products; and for their investment capacity in areas of mutual benefit to both partners.

FINDING
TOP QUALITIES OF COMPETITIVE PARTNER TARGETS

In order to be competitive partner targets, institutions should be able to produce high quality content; be able to influence other potential partners; have previous experience with external partnerships and corporate involvement in the creation of courses and programs; and be willing to continually evolve. Institutional partners should have a clear vision of what their preferred development models and business and fiscal frameworks are at the time of partnership. External partners prefer institutional partners that maintain a strong line of communication, in order to better understand each other's business and use each other's assets more effectively. Having few administrative restrictions was cited as a desirable quality for considering partnership.

D. FUTURE STATE WORKING GROUP

(See Appendix 9 for this working group's full report.)

SCOPE

The Future State Working Group, led by Drs. Chi-Ming Chow and Simon Kitto, was tasked with examining how other national and international institutions are implementing eLearning with a specific focus on medical education by means of an environmental assessment.

Objectives

1. Develop a targeted survey and conduct structured with external institutions.
2. Review and comment on survey findings.
3. Report on local, global leadership, innovation and best practices, which will inform the Task Force's recommendations.

STRATEGY

To complete an environmental scan via surveys and interviews to identify best practices and examine how other institutions across the country and around the world are implementing eLearning, with a specific focus on medical education.

RESULTS

A total of 8 people were interviewed, 5 from Canada, 1 from the United States and 2 from Europe. All participants possessed leadership roles in education. Two had roles specific to eLearning and 3 had positions related to innovative teaching and/or learning.

I) NATIONAL AND INTERNATIONAL INSTITUTION INTERVIEWS

FINDING
GLOBAL COMPARISON

From the website environmental scan and interview responses, it appears that many parts of Canada are still in the early phase of integrating technology into medical curriculum. There is a lack of information available on eLearning as part of strategic plans and policy documents for many Canadian institutions. The Northern School of Medicine (NOSM) exemplifies the exception, having said that eLearning is an important part of their strategic planning and possessing an informatics unit that is "integral to all aspects of the School." Areas of the USA (environmental scan) and UK (survey results and environmental scan) appear to be further along with eLearning.

FINDING
eLEARNING TOOLS AND STRATEGIES EMPLOYED BY INSTITUTIONS

Online learning (including all forms whether full or partial to training, such as online courses, modules, assessment methods, etc) is the most commonly employed eLearning strategy across all levels of physician training (undergraduate, postgraduate and continuing medical education). Simulation, specifically virtual patient technology, is also commonly used in undergraduate and postgraduate medical education. There does not appear to be great investments in eLearning for patient education for the institutions that were interviewed.

FINDING
INTEGRATING eLEARNING INTO THE CURRICULUM—PRACTICES OF INSTITUTIONS SURVEYED

The majority of interview participants (57%) stated that they do not know whether eLearning is part of their strategic planning and all of these were from Canadian institutions. Nonetheless, eLearning activities still receive financial support from their institutions, primarily at the university and faculty level. Another possible means of financial support is through commercialization of eLearning resources (e.g., MOOCs), with 43% saying that they engage in commercialization and 29% indicating that they do not. Not everyone agrees with the commercialization of academic resources; some stated that they were not keen on the concept of commercialization or that they believed in freedom of access to educational materials.

The majority of participants claim to understand the importance and limitations of copyright. Some institutions (29%) offer training for faculty and staff in copyright. Others (29%) choose to avoid copyright and copyright related issues by using materials that do not infringe on copyright and by not selling their products, for example.

Digital literacy and competency in technology use were considered top requirements of both teachers and learners. The majority of institutions interviewed (57%) said they teach informatics topics, such as digital competency and professionalism, to learners of medical education programs. This is achieved, for example, through the implementation of mandatory eLearning modules on informatics topics at the beginning of the academic year and/or training session. It was also noted that faculty have a responsibility to educate learners in digital literacy.

FINDING
BENEFITS AND CHALLENGES OF INCORPORATING eLEARNING INTO MEDICAL EDUCATION

Technology use in medical education was seen as beneficial as a result of improved accessibility to learning materials, the ability to participate and learn from remote locations and improved learning

engagement. It was also noted that eLearning technology allows institutions to better track student progress and performance across departments and programs for greater ease of reporting to the Ministry and Accreditors. This said, implementing eLearning technology in education programs is not without its challenges; funding for research, development and maintenance of technologies is required to maximize eLearning potential for teaching and learning. There are also inherent challenges with technology use, such as bandwidth and hardware requirements. The use of multiple software platforms in an institution can also be an issue, in part because it limits the application of eLearning tools to different courses.

Choosing an appropriate and effective platform, as determined through research of platform efficacy, is proposed by interviewees. Finally, not all learners embrace the use of technology in education to the same degree, as differences have been reported between learners of different age groups.

Looking to the future, interviewees advocate for the pursuit of technology that can enhance learner engagement and collaboration, the implementation of blended learning strategies, and greater collaboration at both the national and international level. The importance of having a well-developed action or strategic plan to guide technology use and development in medical education was also expressed.

DISCUSSION OF WORKING GROUP FINDINGS

The perceptions of faculty, internal partners and staff possessing leadership roles in the Faculty of Medicine, with regards to resources, support and funding for eLearning activities and initiatives, were collected through the How and Why Working Group, the Partnerships and Collaborations Working Group and the Structure, Finances and Human Resources Working Group. The following themes were identified as being necessary across the working groups:

- Institutional support for staff and faculty in eLearning (including assigning formal roles in eLearning, offering adequate training support and recognition for excellence in eLearning);
- Training learners in informatics topics;
- Supports for financing and sustainability of eLearning; and
- Supports for IT infrastructure (human resources, equipment and facilities).

Finally, the need to foster eLearning in the institutional community, the advantages of having a centralized eLearning network and Discovery Commons' future role were also discussed in depth.

STRATEGIC PLANNING

Fostering a Culture Supportive of Innovation

Faculty have been shown to express hesitance in engaging in eLearning primarily due to issues arising from changes in faculty roles, and both administrative and organizational function and structure (Oomen-Early and Murphy, 2009). Cultural change is stated as the second-highest ranked barrier to implementing and engaging in distance education at all stages of organizational capability in distance education, according to Berge and Mulienberg's study on faculty perceptions of barriers to distance education (2001). This is especially true in the earlier stages of eLearning integration, where faculty who are actively involved in the application and development of educational methods and technology face the greatest resistance from their existing organization's culture (Berge and Mulienberg, 2001). Faculty motivation in applying eLearning to their teaching also requires support from the university administration, in that they emphasize the benefits of eLearning and remove barriers to providing eLearning instruction, whether physical or technical (such as with regards to accessibility, technical support, providing effective technologies, etc) (Betts, 1998). It is especially important for the university administration to be cognizant of the requirements of effective instruction in eLearning so that they can better support and inform educators (Oomen-Early and Murphy, 2009).

Fostering an institutional culture that is supportive of innovation is essential for both the integration of technology into the educational curriculum (Cook and Triola, 2009) and in creating sustainable practices in eLearning (Pinto et al., 2011). Being open to innovation (e.g., embracing advances in education) is one of the top-rated qualities of a desirable academic business partner, as cited by external partners of the Partnerships and Collaborations Working Group (e.g., Pearson Canada). External partners prefer working with institutions that administer flexible business models, which can allow for both the changing needs of their partners and of the education industry as a whole (Partnerships and Collaborations Working Group). The ability of an institution to fully integrate technology into their educational curriculum hinges on teachers' acceptance and embrace of these methods. Of those faculty involved in eLearning activities and initiatives most (79%) agree that they belong to a community of educators that incorporates technology into education, and are confident in the use of technology in teaching (87%). These educators could serve as pioneers, leading staff and faculty into the frontiers of eLearning.

FACULTY DEVELOPMENT AND SCHOLARSHIP

Faculty have expressed hesitance in the application of eLearning, with low confidence levels cited as one of the most persistent barriers to doing so (Blake, 2009). In a study by Howell et al., faculty attitudes toward eLearning (specifically distance education) were found to improve with greater engagement in eLearning activities (2004). In order to cultivate educational innovation, faculty must be given greater opportunities to engage in eLearning through incentivizing eLearning excellence, recognizing eLearning scholarship for professional advancement, establish formal roles in eLearning and increasing the technological skill and knowledge base of faculty for increased confidence in eLearning application.

Formal Roles in eLearning

Educational technology does not replace the essential roles of the teacher as a mentor, facilitator and instructional designer. eLearning modalities still require a lot of time and effort on the part of the teacher in these same regards (Cook and Triola, 2014). However, current faculty workload models are designed more for face-to-face teaching than they are for blended learning (Future State Working Group). A common complaint amongst faculty (Future State Working Group, How and Why Working Group and Structures, Finances and Human Resources Working Group) is a lack of time to pursue eLearning activities in addition to

their formal roles and responsibilities. The majority of faculty respondents from the How and Why Working Group (55%) reported that they are not reimbursed for their time spent in the design, development, implementation and/or evaluation of eLearning resources, as they work on their projects mostly during their personal time. Hence, in order to sustainably integrate eLearning into the medical curriculum, revised time budgets would need to be created for the multitude of eLearning activities undertaken by faculty, which can, in turn, be used to help shape faculty expectations with regards to eLearning.

Not only do the time budgets of faculty need to be revised, but staff and faculty must be assigned formal roles and responsibilities related to eLearning. One of the areas of inquiry for the Structures, Finances and Human Resources Working Group's survey was in understanding faculty and staff involvement in eLearning and in what capacity. The majority of positions involving eLearning support are informal, unspecialized and only comprise part of the staff member's responsibilities. The absence of roles and responsibilities in support of eLearning is significantly associated with low funding for faculty and/or professional development in eLearningawards and stipends in recognition of faculty excellence in eLearning teaching or scholarship.

Faculty Recognition in eLearning

The issue of lack of recognition for excellence in eLearning, be it in the form of awards, promotional credit and/or protected time to work on eLearning initiatives, was reported by participants from the Future State Working Group, the How and Why Working Group and the Structure, Finances and Human Resources Working Group. A participant from the Future State Working Group stated that faculty members do not receive appropriate credit for their work devoted to eLearning, in that their efforts and achievements in this domain are not of value when considering faculty for academic reappointment, promotion opportunities, etc. Most of the programs and departments surveyed in the Structures, Finances and Human Resources Working Group (66% of respondents) do not offer financial awards for excellence in eLearning. In order to encourage faculty engagement in eLearning activities and to incorporate eLearning tools and strategies in their teaching, the Faculty of Medicine would need to incentivize excellence in eLearning.

Faculty Development

There is an overall low reported level of funding for faculty and/or professional development related to eLearning. The results of all working groups and the scoping literature review suggest that we need to better assess the training needs of faculty, staff (including leadership staff, support staff, etc) and learners in the Faculty of Medicine. As suggested in the literature scoping review, there are different skill sets and knowledge-bases required of teachers for eLearning, in addition to those required for face-to-face instruction (Kurup and Hersey, 2013), such as being discerning in the appropriate and effective uses of technology, and for which learner populations and teaching contexts. Additional training in course and program instructional design, eLearning resource development, informatics (digital literacy, competency and professionalism)

and copyright protocols is required for the effective integration of eLearning into the medical curriculum.

Training in informatics topics, for both teachers and learners, is especially of significance in ensuring that the potential of eLearning is realized. The majority of institutions interviewed (57%) for the Future State Working Group said they teach informatics topics in their medical curricula, most indicating that training in these topics is compulsory for learners and often administrated at the beginning of the academic year and/or training program. The importance of training in informatics topics such as digital literacy, competency and professionalism were noted as being of great importance for the effective use of eLearning tools and strategies in the literature (Pinto et al., 2011). In both the results of the literature review and the Future State Working Group interviews, teachers were said to be responsible for educating learners on these matters. In contrast to students of the "net generation" and those of subsequent generations exposed to technology from a young age (Sandars and Morrison, 2007), most present-day faculty were trained in traditional instructional methods and require additional training to be able to use technology effectively (Kurup and Hersey, 2013).

Despite the above necessary changes for improved faculty development, 55% of faculty surveyed in the How and Why Working Group reported that they agree to strongly agree that the Faculty of Medicine supports its educators in developing eLearning teaching skills.

Importance of Training Learners in Informatics Topics

Providing training for learners in informatics topics is also important for achieving greater effectiveness in eLearning (Future State Working Group scoping literature review). This is mentioned more with regard to social media, and in noting the importance of maintaining patient confidentiality and professionalism (Forgie et al., 2013). Participants of the Future State Working Group state that one of the greatest challenges in providing technology-based education is the variation in levels of acceptance and willingness to embrace technology between learners of different generations. Formal training in digital literacy and competency could help to improve the overall comfort levels of learners in the use of technologies, especially if these learner perspectives are the result of a lack of familiarity with technology usage.

FUNDING

The costs associated with eLearning interventions are often undiscussed or given little treatment in the literature (Cook and Triola, 2014). The largest expenses mentioned may likely be instructors' time spent on eLearning activities and in investments in human capital (Cook and Triola, 2014). The latter is especially true with regard to maintaining digital fluency among teachers and learners on account of the rapid flux in technologies available for education (Cook and Triola, 2014). While some technologies, such as

virtual microscopy (Hamilton et al., 2012), are more cost-efficient than their traditional alternatives, the cost of other technologies, such as simulation, continues to be a hurdle in fully integrating them into the curriculum (Bashir, 2010). Overall, however, we may be dawning on an era where effective eLearning resources can be obtained at a low cost and, in some cases, for free (Cook and Triola, 2014).

Integration of eLearning into the medical curriculum should be done carefully, so as to not incur any unnecessary additional costs. It may be wiser, for example, to invest in the more cost-efficient technologies that possess slightly less than ideal percent efficacy, for their greater economic sustainability (i.e., weighting value-added to learning with cost when selecting technologies to be implemented) (Cook, 2014). Additionally, many eLearning initiatives incur more costs than necessary (Cook, 2014). When developing eLearning resources, we should also distinguish between the aesthetics of the eLearning interface and its effectiveness for teaching and learning (2014). It may be more economically feasible to adopt the bare minimum requirements for functionality when developing a resource, instead of investing heavily in aesthetics (Cook, 2014).

Another issue that must be considered when taking into account the cost of implementing eLearning is the need to overcome challenges of learner use of and participation in educational technology (Sargeant et al., 2000). eLearning modalities can be expensive in both time and resources; therefore, it is important to assess learner preferences, ease of use and how it will be integrated into the curriculum prior to investing in them (Cook and McDonald, 2008).

Faculty and Staff Members' Perspectives on Funding of eLearning Initiatives

The challenge of securing funding for eLearning initiatives is not unique to the Faculty of Medicine; it is shared by other institutions across Canada and abroad, as evidenced by the Future State Working Group results. The need to seek out additional sources of funding for innovative research in eLearning and for technological resource development, maintenance and integration into the curriculum is discussed as being an institutional priority by participants from all four working groups, as well as being discussed in the literature (scoping literature review). The majority of participants from the Future State Working Group reported that they receive most of their funding for eLearning at the university level; however, leadership staff in the Faculty of Medicine report that they rarely to never receive financial support for eLearning developments from the university and/or their university department (Structure, Finances and Human Resources Working Group).

Internal partners reported that better infrastructure is needed to support the use of eLearning in educational practices. Funding is needed for research and development of eLearning technology and a greater awareness of funding opportunities for eLearning needs to be generated.

Available Financial Resources for eLearning

While there were few opportunities identified for funding of educational initiatives pertaining specifically to eLearning, there appeared to be more opportunities available than faculty were reportedly aware of (Structure, Finances and Human Resources Working Group). Despite the available funding, the majority of respondents (61%) stated that their unit or department does not receive major grants for eLearning projects, programs and/or application development. In some instances, the inventory of grants and awards conducted as part of the Structure, Finances and Human Resources Working Group displayed evidence of departments of the Faculty of Medicine having received funding, yet the leadership staff in these departments did not report having received anything. Thus, while it is apparent that additional financial resources must be allocated to eLearning, it is also necessary to advertise those already available.

INFRASTRUCTURE AND RESOURCES

IT Infrastructure: Human Resources, Equipment (Hardware and Software) and Facilities (Space)

Issues pertaining to eLearning infrastructure, such as inadequate time, resources, facilities and technology support, were commonly cited as barriers to sustaining innovation in eLearning (mentioned in results of all four working groups; scoping literature review). Both the participants of the Future State Working Group and Partner and Collaborations Working expressed the need to take advantage of all available resources, alluding to the fact that more may be available for use than faculty are aware of. In order to raise awareness of the resources already available and to acquire further resources, it is necessary to make eLearning a priority for all departments of the Faculty of Medicine.

Human Resources for eLearning Resource Development and Maintenance

The fact that most of the faculty surveyed (How and Why Working Group) claim to develop eLearning resources primarily by themselves most or all of the time alludes to the potential issue of not having skilled staff in this domain (e.g., programmers, eLearning designers, videographers, etc) at their disposal.

In addition to eLearning development staff, technology support staff is also considered essential (Future State Working Group). Hence, the recruitment of eLearning experts (both faculty and staff) would need to be part of the Faculty of Medicine's strategic plan for eLearning.

Critique of Learning Management Systems

Issues with Learning Management System (LMS) platforms were mentioned explicitly in 3 of the 4 working groups (How and Why, Future State and Partnerships and Collaborations). The Blackboard LMS platform, in particular, was noted for its inflexibility (Partnerships and Collaborations Working Group), its inability to support multi-media rich content (How and Why Working Group) and inherent technological issues (How and Why Working Group). Internal partners of the Partnerships and Collaborations working group suggested that active assessment of LMS platforms be conducted to determine the most useful option, to be adopted at a university-wide level (Partnerships and Collaborations Working Group and Future State Working Group). Implementing one proven-to-be-effective LMS platform across the institution is said to be important for enabling sharing of modules between courses (Partnerships and Collaborations Working Group). By re-appropriating eLearning resources for different courses and training purposes, the utilization of institutional resources can be maximized at a minimal cost.

Importance of Evaluating Product Efficacy

When assessing the utility and effectiveness of eLearning in teaching and learning, it can be difficult to separate the hype from reality (Cook and Triola, 2014). It is generally agreed upon that eLearning is effective in comparison to no intervention and is at least on par with traditional methods with regard to learning outcomes (Cook et al., 2008; Cook et al., 2010). While no single eLearning tool or strategy may be able to solve all educational dilemmas, eLearning can be used to add value to traditional educational methods (Cook and Triola, 2014). It is suggested that medical education, in particular, should adopt a blended learning approach, as the complexity of the curriculum demands a diversity of teaching and learning methods, only some of which include educational technology (Cook and Triola, 2014).

It is important to consider that just because an educational technology is at the cutting edge, does not mean its value will be commensurate with its cost (Cook and Triola, 2014). It is important to judge the value of a technology or eLearning strategy on a cost to value-added basis, with value specifically referring to the effects on learner outcomes (Cook and Triola, 2014). In terms of "educational productivity", it may actually be more beneficial to invest in technologies that generate 'good' results for a fraction of the cost of those that produce exceptional results at an exceptionally high expense (Cook and Triola, 2014).

The importance of actively assessing the effectiveness of tools and technologies prior to implementation was reported in

both the Partnerships and Collaborations Working Group and in the literature (scoping literature review). eLearning tools and technologies must also be tested for their ease of integration with other tools in use by the university, to ensure their use and applications complement each other. Part of evaluating tools for their effectiveness involves appropriately matching their application to different learner populations (scoping review; partnerships and collaborations). Learner characteristics, such as knowledge base, spatial abilities, training level, specialty and interests, must be considered in the application and development of eLearning resources. A solution proposed by David Cook is to provide learners with multiple educational tools that have been proven to be effective and allow learners to self-select those most conducive to their learning preferences (2012).

Institutions could also obtain greater assurance of product efficacy by forming partnerships with external partners such as Pearson Canada and John Wiley and Sons, for whom product efficacy is a central component of their business agenda (Partnerships and Collaborations Working Group). External partners expressed the need to be able to demonstrate that their products have a lasting impact on learning outcomes. Such external partners often collaborate with institutions in conducting research to help evaluate the efficacy of resources (e.g., by tracking and monitoring student progress in the use of digital resources) (Partnerships and Collaborations Working Group). Hence, in forming such external partnerships the Faculty of Medicine would have greater access to proven-to-be-effective tools and possibly guidance in the appropriate uses and applications of technology.

The University of Toronto Mississauga campus library has already had involvement in projects to assess educational technology used at the institution. They collaborated with the UTM Academic Skills Centre, for example, to determine whether technology tools such as iClickers (classroom response systems) and online assessments are effective for students using these tools in a history course, over a two-year period. They also collaborated with the University of Toronto St. George campus (UTSG) Centre for Teacher Support and Innovation (CTSI) to evaluate technology processes. In addition, the UTM library conducted research on the effectiveness of using E-presence for courses held at the UTSG.

The Appeal of a Centralized Network For eLearning

Internal partners of the Partnerships and Collaborations Working Group expressed the value in having a centralized network for eLearning to share best practices, knowledge, resources and tools among faculty and staff. Such a network would help to facilitate collaboration between units and departments, helping to create an institutional community. This would allow faculty to work on the same issues in unison, as opposed to having multiple overlapping eLearning projects being developed simultaneously. This could streamline existing funding allocations, in order to maximize the impact of current funds.

The Evolving Role of Discovery Commons

The Discover Commons is the Faculty of Medicine's information technology support unit. It houses the largest area of space dedicated for eLearning in the Faculty of Medicine, at 361 m^2. The results from the How and Why Working Group and the Structure, Finances and Human Resources Working Group suggest that the Discovery Commons must evolve as eLearning becomes a more substantial part of medical education. Faculty participants of the How and Why Working Group listed costs of services offered by the Discovery Commons as one of the greatest barriers to its use in assisting with eLearning resource development, up-keep and/or maintenance. In order to explore and assess the Discovery Commons as a current and potential resource for the development and support of eLearning, further investigation of current barriers to utilization (e.g., cost, expertise and availability) is necessary.

RECOMMENDATIONS

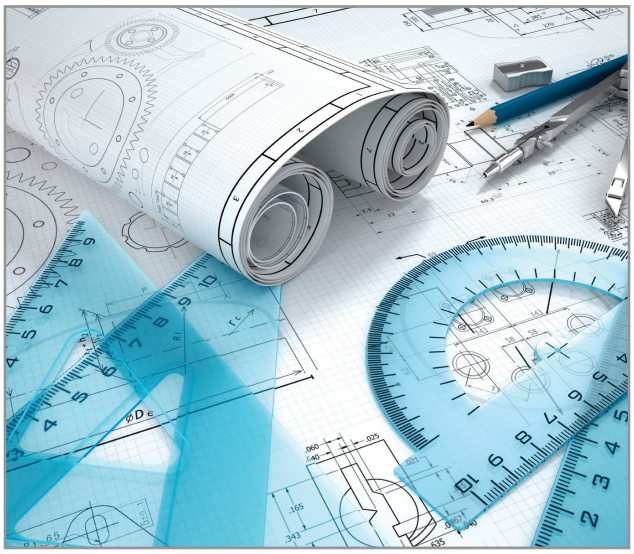
From the comprehensive assessments offered by the four working groups, a series of strategic recommendations were developed that form a roadmap to advance the Faculty of Medicine at the University of Toronto as a global leader in eLearning across the education continuum.

STRATEGIC PLANNING

1) Position the Faculty of Medicine to become a leader in eLearning by establishing effective and innovative use of eLearning as a core competence in the delivery of medical, graduate life sciences and health professions education. Create a roadmap for change where inclusion/integration of eLearning becomes the new norm:

   - Position eLearning as a priority in the Faculty of Medicine strategic plan;
   - Establish appropriate and effective use of eLearning as a priority in curriculum development across all education programs;
   - Formalize faculty and staff eLearning positions, including Chairs;
   - Recruit eLearning experts (both faculty and staff);
   - Adjust faculty workload models to incorporate eLearning-related initiatives and teaching activities (i.e., blended workload models);
   - Encourage cross-departmental and interfaculty collaboration;
   - Establish program evaluation systems to monitor effectiveness of eLearning technologies; and
   - Promote excellence in eLearning.

2) Consider both learner preferences and learner readiness for the effective inclusion of eLearning tools to support and enhance learner outcomes in medical, graduate life sciences and health professions education.



FACULTY DEVELOPMENT AND SCHOLARSHIP

3) Establish faculty development programs and just-in-time resources to provide the additional skills and support required of teachers when including eLearning tools and strategies in medical, graduate life sciences and health professions education, including topics such as:

   - Informatics;
   - Technology and software usage;
   - Copyright training;
   - Theory and practice of eLearning scholarship; and
   - Real time support for problems encountered by teaching faculty around eLearning tools/techniques.

4) Support and promote eLearning scholarship.

FUNDING

5) Develop a financial strategy to generate funding to support eLearning in the Faculty of Medicine. The strategy would consider:

   - Commercialization and income generation from education products and services;
   - Advancement and strategic investments, for example to create an endowed Chair and/or an Extra-Departmental Unit (EDU);
   - Strategic partnerships with the private sector;
   - Cost-sharing models;
   - Realigning existing funds to maximize their impact; and
   - A marketing and brand/reputation management strategy.

6) Provide financial support for eLearning courses, programs and initiatives across the education continuum by:

   - Incentivizing excellence in eLearning within the Faculty of Medicine;
   - Facilitating the advancement of new eLearning programs and tools;
   - Mobilizing resources to fund eLearning and special projects; and
   - Providing sustainability funding.

7) Recognize excellence in eLearning teaching and research through grants and awards, and the university promotion process.

INFRASTRUCTURE AND RESOURCES

8) Create a centralized resource (one-stop shop) for learners and faculty where they may seek help, information and advice regarding eLearning. Provide teachers with the technical and instructional design support necessary to effectively implement new and innovative learning strategies and eLearning in their courses through a combination of centralized faculty support services and departmental support, including:

   - Business development and related business services (legal, commercialization, business case development, marketing and reputation management);
   - Production and technical support (information technologies, website production, video production, applications/ LMS support);
   - Academic excellence in eLearning (pedagogy design, best practices and related community supports); and
   - Dedicated infrastructure: office, space, specialized equipment, etc.

9) Explore and assess the feasibility of reorganizing current Faculty of Medicine resources, such as the Discovery Commons and teaching labs, for the development and support of eLearning initiatives and resources within the Faculty of Medicine. In the short-term, ensure that future initiatives, such as the Toolbox Renewal Initiative, align with and support future Faculty eLearning directions.

10) Leverage and strengthen relationships by aiming to make efficient use of existing university-wide resources and services, which may include (but are not limited to): library services, the Centre for Teaching Support and Innovation (CTSI) and other faculty and university resources.

11) Establish an eLearning Community of Practice, which would include:

   - An eLearning Committee;
   - An online platform for information exchange and networking;
   - Events designed to network the eLearning community in the Faculty of Medicine and beyond; and
   - Events and recognition processes to promote and celebrate accomplishments and achievements.

IMPLEMENTATION PLAN

In order to implement these recommendations, three interdependent, short-term action priorities have been identified: **Leveraging Existing Resources**, **Developing a Centralized Network For eLearning** and **Fostering a Culture Supportive of Innovation**.

Leveraging Existing Resources

There are extensive potential eLearning resources currently available within the Faculty of Medicine; however, they would need to be streamlined and reallocated to be more effective and to maximize impact. To achieve this, the Faculty of Medicine is encouraged to facilitate partnerships and collaborations with University of Toronto units (including the Centre for Faculty Development, i+e and teaching labs) and with hospitals; support the reorganization of Discovery Commons; and realign existing funding sources (including the Education and Development Fund and the Provost's Instructional Technology Innovation Fund (ITIF) and existing education and teaching awards).

Developing a Centralized Network For eLearning

Enhanced institutional support for faculty and staff in eLearning will be vital to the success of future eLearning initiatives, not only by providing specialized support but also by encouraging collaboration and sharing innovations and discoveries. To provide this, the Faculty of Medicine is encouraged to establish a centralized network for eLearning to share best practices, knowledge, resources and tools among faculty and staff; to facilitate collaboration between units and departments; and to help to create an institutional community.

Fostering a Culture Supportive of Innovation

eLearning is a dynamic and evolving field in medical education, and to spark new innovations, faculty accomplishments need to be supported, encouraged and recognized. To increase awareness of the range of possibilities, it will be important to share eLearning strategies that have been successful within our programs and departments, as well as evidence of effectiveness with an end goal of ensuring faculty acceptance and encouraging adoption. Faculty possess varied attitudes toward the use and proper application of eLearning methods and technologies (Blake, 2009). An innovation-supportive culture could help to promote further faculty engagement in eLearning, thereby cultivating the confidence and skills necessary to implement technology in their every-day teaching practices and potentially help pioneer future initiatives.

In order to facilitate knowledge mobilization, communication will be imperative to create a sustainable institutional culture of innovation where faculty regularly engage in eLearning activities and incorporate eLearning tools and strategies in their teaching. Incorporating eLearning into the Faculty of Medicine's strategic planning will result in a greater importance placed on cultural change, thereby facilitating greater strides in eLearning engagement and implementation (Berge and Mulienberg, 2001).

THE ROAD AHEAD

The Faculty of Medicine is encouraged to highlight eLearning as a strategic priority, mobilize start-up funding and incentivize excellence in eLearning by recognizing faculty and staff efforts and achievements and establishing financial awards and grants for excellence in eLearning.

APPENDICES

All appendicies are available on the eLearning Task Force Hub website.
http://www.innovatingedu.ca/elearning/

1. Task Force Terms of Reference
2. Full Task Force Composition
3. Working Group Recommendations Summary Table
4. How and Why Working Group Full Findings Report
5. Learner Focus Group Report
6. Literature Scoping Review
7. Structure, Finances and Human Resources Working Group Full Findings Report
8. Partnerships and Collaborations Working Group Full Findings Report
9. Future State Working Group Full Findings Report

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