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The Search for Meaningful e-Learning at Canadian Universities: A Multi-Institutional Research Study

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Article abstract

While e-learning is now characterized by a past and trends within that past, there continues to be uncertainty about how e-learning is defined and conceptualized, whether or not we like e-learning, and whether or not it is as meaningful to us as face to face learning. The purpose of this study was to document the e-learning perceptions of students at three Canadian post-secondary institutions. Key components of e-learning courses including ease of navigation, course design, resource availability, and adequacy of e-learning supports and their impact on the student learning experience were also evaluated. Based on a survey of students (n= 1,377) as well as their participation in focus groups, the following are presented as important findings: the majority of students studying in e-learning courses at the three institutions represented in the study were women; ease of navigation, course design, and previous experience with e-learning consistently demonstrated a statistically significant predictive capacity for positive e-learning experiences; and students expressed less preference for e-learning instructional strategies than their faculty. Study findings hold implications for e-learning faculty, instructional designers, and administrators at institutions of higher education in Canada and elsewhere where e-learning is part of the institutional mandate. Additionally, further research into student perceptions of and experiences with e-learning is recommended.

IRRODL THE INTERNATIONAL REVIEW OF RESEARCH IN OPEN AND DISTANCE LEARNING

The Search for Meaningful e-Learning at Canadian Universities: A Multi-Institutional Research Study

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Abstract

While e-learning is now characterized by a past and trends within that past, there continues to be uncertainty about how e-learning is defined and conceptualized, whether or not we like e-learning, and whether or not it is as meaningful to us as face to face learning. The purpose of this study was to document the e-learning perceptions of students at three Canadian post-secondary institutions. Key components of e-learning courses including ease of navigation, course design, resource availability, and adequacy of e-learning supports and their impact on the student learning experience were also evaluated.

Based on a survey of students (n = 1,377) as well as their participation in focus groups, the following are presented as important findings: the majority of students studying in e-learning courses at the three institutions represented in the study were women; ease of navigation, course design, and previous experience with e-learning consistently demonstrated a statistically significant predictive capacity for positive e-learning experiences; and students expressed less preference for e-learning instructional strategies than their faculty.

Study findings hold implications for e-learning faculty, instructional designers, and administrators at institutions of higher education in Canada and elsewhere where e-learning is part of the institutional mandate. Additionally, further research into student perceptions of and experiences with e-learning is recommended.

Keywords: e-learning; mixed methods; navigation; design; infrastructure support; flexible learning

Introduction

Among the many reasons that increasing numbers of first degree university students and returning adult learners are turning to e-learning, two in particular stand out. The first is student demand for flexibility in where and how they learn (Ali, 2012; Bichsel, 2013; Burge, 2011; Carter & Salyers, 2013; Carter, Salyers, Page, Williams, Hofsink, & Albl, 2012; Elliott, 2011; Hammersley, Tallantyre & Le Cornu, 2013; Hanover, 2011; Higher Education Academy, 2013; Johnson, Smith, Willis, Levine & Haywood, 2011; McLinden, 2013; Oye, Salleh & Iahad, 2011; Salyers, Carter, Barrett & Williams, 2010). The second is that, as never before, university students may be technologically sophisticated and looking for ways to better integrate technology with their learning lives (Bichsel, 2013; Dahlstrom, Walker & Dziuban, 2013; Johnson, Smith, Willis, Levine & Haywood, 2011; Tapscott, 2008).

As support of the second reason, university students have, in large measure, grown up with technology; they socialize, book vacations, bank, and shop through the web. There is also growing recognition of the personal savings of studying in ways that fit complex professional and family lives (Dahlstrom, Walker & Dziuban, 2013; ITC, 2013). At the same time, controversy exists about whether those who use technology in other aspects of their lives also wish to use it for learning where the engagement is complex and the role of learner is significantly different than in other technology-supported situations (Cleveland-Innes, Garrison, & Kilsen, 2008). While students may prefer to utilize technology to connect, communicate, and manage their lives, they may or may not have the requisite skills for success in technology-mediated and e-learning environments (Bolinger & Inan, 2012; Dahlstrom, Walker & Dziuban, 2013; Johnson, Adams-Becker, Cummins, Estrada, Freeman & Ludgate, 2013; Means, Toyama, Murphy, Bakia & Jones, 2010; Yukawa, Kawano, Suzuki, Suriyon, & Fukumura, 2008). Also of importance is that research demonstrates there are no differences between net generation and non-net generation students' use of technology, their preferences for it, and their behavioral characteristics (Bullen, Morgan & Qayyum, 2011; Margaryan, Littlejohn & Vojt, 2011; Palfrey, Gasser, Simun & Barnes, 2009; Selway, 2009).

Although the intention of those who champion e-learning is to provide students access to superior educational experiences characterized by flexibility not possible 20 years ago, there continues to be uncertainty about how e-learning is defined and conceptualized, how best to integrate e-learning strategies into curricula, and whether or not e-learning is as meaningful to us as face to face learning. In order to assess the Canadian e-learning landscape, a research team representing three undergraduate universities undertook a multi-site mixed methods study to determine the perceptions of faculty and students in relation to e-learning as a meaningful experience. Because of the magnitude of data collected, quantitative and qualitative results based on student and faculty responses are reported separately. This paper reports the student-based quantitative findings.

Review of the Literature

E-Learning Defined

The words innovation and novelty derive from the same Latin root meaning something new and, ideally, improved. In an early definition of the verb to innovate, the desire to innovate is reported to "moveth all troublesome men" (Ellis, 2005, p. 13). Stated in more modern terms, the act of innovation can stir strong emotions. There is little doubt that the innovative nature of e-learning has generated strong feelings and opinions across the educational community as well as in our homes when we discuss education and in the corporate training sector where training has assumed new formats. Innovation is not something new to education. As societal needs, demands, and expectations change, so too must education, and such has been the case throughout history.

Reflecting on educational innovation in North America over the last twenty years, a number of concepts and practices come to mind: distance and online education, blended education, technology-supported education, and e-learning. While the first three of these can be considered in their own right, each is a subset of item four: e-learning. The language of e-learning has generated a unique quagmire with no consistent definition of e-learning in sight (Carter & Salyers, 2013; Lowenthal & Wilson, 2010; Moore, Dickson-Deane & Galyen, 2011; Sangra, Vlachopoulos & Cabrera, 2012). Equally problematic are pedagogies that affect how teachers teach and students learn and the heightened role of technologies in what is otherwise a human exchange.

In this study, e-learning refers to an integration of pedagogy, content, and technologies within a teaching and learning context. E-learning can, therefore, include face-to-face (f2f) classrooms in which information technologies (e.g., learning management systems, video-conferencing and web-conferencing, mobile devices, multimedia and simulation, and so forth) are used; blended and web-enhanced learning environments also known as flipped or hybrid classrooms; and fully online learning environments. E-learning is also an experience that can occur synchronously, asynchronously, or as a combination of the two (Carter & Salyers, 2013).

Characteristics of Effective E-Learning Environments

Higher education has become a competitive market grounded in flexible, accessible, user-centric learning experiences (Buzducea, 2010; Carter, Salyers, Page, Williams, Hofsink, & Albl, 2012). In other words, students want to be able to access education in convenient environments where they are supported but also free to engage with materials in different ways. Flexibility includes how institutions think about time, place, instructional pace, delivery methods, and learner entry (Ahmed, 2010; Bichsel, 2013; Carter, Salyers, Page, Williams, Hofsink, & Albl, 2012; Fisher, 2009; Hanover, 2011; ITC, 2013; Johnson, Smith, Willis, Levine & Haywood, 2011; McLinden, 2013; Salyers,

Carter, Barrett, & Williams, 2010). How we teach and learn using e-learning strategies, though, is different from teaching and learning in a classroom where technology is not used. Pedagogically, the e-learning landscape requires a renewed commitment to the design of instruction that is student-centered and that incorporates effective teaching and learning principles in technology-mediated environments.

It is generally agreed that, in order to design effective e-learning environments, a number of stakeholder groups including subject matter experts, instructional designers, information technologists, and educational technologists should be engaged (Herrington, Reeves & Oliver, 2010; Kanuka, 2006; Siragusa, Dixon & Dixon, 2007; Steen, 2008). Moreover, a number of elements must be well-integrated into e-learning environments to ensure that they are effective. Quality e-learning environments should: 1) address the needs of diverse learners, 2) apply effective pedagogical strategies, 3) incorporate state of the art instructional design principles, 4) support multiple technologies, and 5) provide for flexible and interactive learning opportunities (Buzzetto-More, 2007; Hussin, Bunyarit & Hussein, 2009; Moore, Dixon-Deane & Galyen, 2011; Oblinger & Oblinger, 2005; Orellana, Hudgins & Simonson, 2009; Sun, Tsai, Finger, Chen & Yeh, 2007).

Student Perceptions of E-Learning

Much of the current research related to student perceptions of e-learning has focused on student satisfaction, achievement, flexibility, motivation, and retention based on a particular delivery format such as blended, fully online, and so forth (Abrami, Bernard, Wade, Schmid, Borokhovski, Tamim, Surkes, Lowerison, Zhang, Nicolaidou, Newman, Wozney & Peretiatkowicz, 2006; Bekele, 2010; Bekele & Menchaca, 2008; Bernard, Abrami & Wade, 2007; Zuvic-Butorac, Roncevic, Nemcanin, & Nebic, 2011; Fetaji, 2007; Sun, Tsai, Finger, Chen & Yeh, 2008). Many of these studies report variables such as satisfaction at the end of the course rather than prior to taking an e-learning course (Ahmed, 2010; Albert & Johnson, 2011; Eom, Wen, & Ashill, 2006). Student perceptions of e-learning are higher when elements such as accessibility, design, organization, interactivity, and supports for e-learning are fully integrated into the course experience (Allen & Seaman, 2013; Bentley, Selassie, & Shegunshi, 2011; Brown & Voltz, 2005; Siragusa, Dixon & Dixon, 2007; Steen, 2008; Tseng, Lin & Chen, 2011; Wang, 2006; Zuvic-Butorac, Roncevic, Nemcanin & Nebic, 2011).

Designing effective e-learning environments poses a number of challenges, none the least of which include diversity of student learners, adequate institutional supports, faculty and student perceptions of e-learning strategies, and engagement in non-face to face (f2f) learning environments (Allen & Seaman, 2006; Bolliger & Wasilik, 2009; Cook, Ley, Crawford & Warner, 2009; Georgina & Olson, 2008; Kennedy, Jones, Chambers & Peacock, 2011; Panda & Mishra, 2007; Ward, Peters & Shelley, 2010). Whether we consider e-learning to be a philosophy or method or niche experience, it does represent a commitment to meet the learning needs of today's students (Bates, 2005; Fisher, 2009). Despite differing views and understandings of e-learning,

institutions are challenged to be committed and forward thinking in terms of how to meet the diverse and changing needs and expectations of all learner groups. In order to begin to address the changing e-learning needs of students, faculty, and post-secondary institutions and in light of rapidly changing e-learning landscape, the authors of this paper have explored the e-learning perceptions of students in three post-secondary institutions in Canada.

Question for Investigation

Repeated research evidence seems to suggest that students may continue to lack the knowledge, skills, and/or time they require to experience e-learning in meaningful ways. Additionally, they may have different opinions of and experiences with e-learning. As a response to this situation, the purpose of this study was to evaluate key components of e-learning courses and environments including ease of navigation, course design, resource availability, technical ability, and adequacy of e-learning supports and their impact on the student e-learning experience. Results of this study will be used to inform decisions at Canadian universities in the pursuit of excellence in e-learning. The specific question explored in the study was the following:

> How predictive are the key components of e-learning as reflected in the literature for the enhancement of learning, active participation, comfort with e-learning technologies, adequacy of e-learning skills, enjoyment of e-learning, preference for e-learning over face to face classes, and the development of e-learning skills of students enrolled in e-learning courses?

Theoretical Orientation

The theoretical orientation that guided the research is based on Khan's (2010) global e-learning framework. The framework was developed as a means for guiding the planning, design, development, and evaluation of e-learning environments based on eight dimensions. Table 1 summarizes the focus and key activities of each dimension.

Table 1

E-Learning Framework Summarized by Aguti, Walters & Wills (2013)

Dimension	Focus on e-learning environment	Specific components
Pedagogical	Teaching and learning	• Analysis of content, audiences, goals, media, • Organization and layout of e-learning systems, • Design strategies, methods and approaches.
Technological	Technology infrastructure	• Infrastructure planning, • Hardware and software.
Interface Design	Aesthetics and design	• Page, site, and content design, • Navigation, accessibility, • Usability testing.
Evaluation	Assessment of learning and environment	• Assessment of learners, • Evaluation of instruction, • Evaluation of learning environment, • Evaluation of content development processes, • Evaluation of individuals involved in content development, • Evaluation of institutional e-learning program.
Management	Maintenance of learning environment	• Managing information distribution, • Managing e-learning content development, • Managing e-learning environment.
Resource Support	Technical and human resource support	• Online support, • Teaching and learning support, • Technical support, • Online and offline resources.
Ethical	Social, cultural, digital	• Social and political influences, • Cultural diversity, • Learner diversity, digital divide, • Legal issues.
Institutional	Administration, academic affairs and student services	• Admissions, finances, payments, • Information technology services, policies • Graduation and grades.

The researchers were particularly interested in the pedagogical, technological, interface design, evaluation, and resource support dimensions and their impact on student e-learning perceptions. Based on Khan's framework, an e-learning skills inventory (ESI) was developed and administered as part of the study. It is described later in this paper.

Study Design and Methods

Participating Institutions

As previously noted, the study involved three post-secondary institutions. The lead university has an enrollment of nearly 12,000 credit students who take a variety of programs and courses leading to bachelor's degrees, applied degrees, university transfer courses, diplomas, and certificates. The second institution provides post-secondary technical education and skills training, and is recognized nationally and internationally for its educational innovation. This institution serves 26,000 distinct students with programs that touch every sector of the economy and provides a number of courses and programs through distance education. The third university enrolls nearly 6,500 full and part-time students. The majority of programs are at the undergraduate level although a growing number of graduate programs are offered by this university.

Study Design

This two-year three-phase project used a descriptive mixed-methods design. In Phase I of the project, the team developed a definition of e-learning, determined roles and tasks (e.g., PI, Co-PI, collaborators), discussed knowledge dissemination activities and issues of authorship, developed research instruments, and reviewed ethics approval processes at the three institutions. Ethics approval was sought and received from all three institutions. Phase II involved data collection and analysis as well as triangulation of qualitative and quantitative findings. Analysis occurred from December 15, 2012 to April 30, 2013. Phase III began in April 30, 2013 and was completed in January 31, 2014. Development of recommendations, including possible interventions and dissemination of knowledge, were part of the work of Phase III.

This mixed method study used a concurrent triangulation design to guide and facilitate data collection. In this approach, quantitative and qualitative data are collected at designated points and triangulated (Creswell, 2009; Creswell, Plano Clark, Gutmann, & Hanson, 2003). Data are then compared in order to identify similarities, differences, gaps, and unanswered questions. Figure 1 provides a visual representation of the research design. Because this specific paper focuses exclusively on the quantitative findings of the study based on student responses, evaluation of the triangulation design by the reader is not possible.

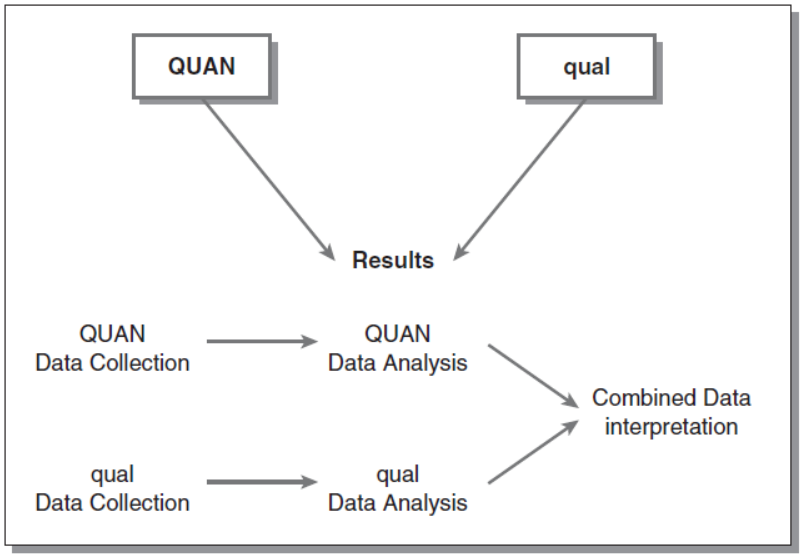

Figure 1. Concurrent triangulation design by Creswell, Plano Clark, Gutmann, & Hanson (2003).

Data Gathering

The collection of quantitative data from students occurred concurrently from January 1, 2012 to December 15, 2012. Quantitative data were generated through online surveys. The participating sample was convenience based. Each institutional lead sought permission to invite undergraduate students from all faculties and schools to complete the survey made available through a live online link distributed through the university's email system.

The online survey distributed to students was developed by the research team who had consulted the literature and reviewed existing tools. The survey included 34 items that used a 5-point scale (1 = strongly disagree; 2 = disagree; 3 = agree; 4 = strongly agree; and 5 = not applicable) and functioned as an e-learning skills inventory (ESI). Areas covered in the survey included the following: level of knowledge regarding e-learning, prior experience using e-learning, access to e-learning and other resources, and general technology usage. Scale reliability for the student survey was calculated based on rank transformations. The internal consistency for the student ESI was α=.71. This alpha coefficient is satisfactory based on using Nunnally's (1978) criterion of .70 as a cut-off point. Basic demographic information was also collected from students.

Data Analysis

All data were aggregated. Demographic profiles of the student participant groups were developed while descriptive and inferential statistics using SPSS 19.0 were generated based on the survey responses. Multiple regression analyses were conducted to evaluate

the effectiveness of the independent variables–ease of navigation in the e-learning course, previous experience with an e-learning course, e-learning course design, technical ability, availability of e-learning course support, and adequacy of resources—to predict seven dependent variables which were enhanced student learning, active student participation, comfort with the e-learning environment, adequacy of e-learning skills, enjoyment of e-learning, preference for taking e-learning courses, and the development of e-learning skills. Assumptions of independence, normality, homoscedasticity, and linearity were addressed. There were two instances where data were found to be outside the limits of skewness or kurtosis. They, however, were corrected for through rank transformations. Probability-probability (P-P) plots were generated for each multiple regression carried out and were linear in all instances, suggesting that the data were normally distributed.

Findings

Demographic Profiles

The study included a total of 1,377 student-participants across the three Canadian post-secondary institutions; the vast majority of the student-participants (76.7%) were female. The two age categories most represented were 20-22 (27.1%) and 17-19 (23.2%). Asked about their levels of experience with e-learning, 33.0% reported 2-4 years of experience taking courses that use e-learning strategies; 30.7% of students reported 0-2 years of experience with courses that use e-learning strategies. Table 2 summarizes student characteristics across the three institutions.

Table 2

Demographic Profile of Survey Participants

Total sample size	n =1346
Gender *	
Male	310 (22.9%)
Female	1039 (76.7%)
Other	6 (0.4%)
Age *	
17 – 19	316 (23.2%)
20 – 22	369 (27.1%)
23 – 25	215 (15.8%)
26 – 28	118 (8.7%)
29 – 35	133 (9.8%)
35 – 64	208 (15.3%)
> 64	2 (0.1%)
Years taking courses using e-learning strategies *	
0 – 2	397 (30.7%)
2 – 4	426 (33.0%)
4 – 6	280 (21.7%)
6 – 8	103 (8.0%)
8 – 10	34 (2.6%)
10 – 12	35 (2.7%)
>12	17 (1.3%)
Current institution	
Post-secondary A	816 (59.3%)
Post-secondary B	456 (33.1%)
Post-secondary C	104 (7.6%)

*This category had missing data (e.g., students did not complete this question). Percentages are calculated based on responses received.

General Perceptions of E-Learning

Student responses demonstrated consistent strong agreement or agreement on a cross-section of items. In general, the student data were positive with respect to e-learning: 80% of students strongly agreed or agreed that “e-learning technologies enhance my learning” while 84% strongly agreed or agreed with the statement that “overall, I have adequate e-learning skills to take courses using e-learning technologies.”

Of the student-participants, 85% indicated that they had been comfortable using computers and software applications before they took an e-learning course. Just over half (51%) of students indicated agreement to strong agreement with the item that “e-learning encourages me to participate more actively (in my learning).” Less than half (43%) of students agreed or strongly agreed with the item “I prefer courses using e-learning technologies more than traditional courses.”

Participants (97%) believed that students in post-secondary institutions should be able to navigate in e-learning course environments. Students (84%) strongly agreed or agreed that "students attending post-secondary institutions should have moderate to high e-learning skills." Moreover, students (85%) agreed or strongly agreed that "the design of courses using e-learning strategies is important."

Question One: E-Learning Components and Predictive Capacities

Ease of navigation, course design, adequacy of e-learning supports, and previous experience with e-learning consistently emerged as having a statistically significant predictive capacity for each dependent variable. Statistically significant results and cumulative student r-square values for each regression analysis are provided in Tables 3-9.

Table 3

Regression Analysis – Dependent Variable: Enhanced Student Learning

Independent variable	Parameter estimate	Standard error	Standardized coefficients Beta	T for Ho: Parameter=0	Prob>|T|
Students					
Ease of navigation in e-learning courses	.392	.036	.365	10.922	.000***
Design of e-learning courses	.173	.033	.161	5.211	.000***
Adequacy of e-learning supports	.112	.036	.108	3.070	.002**

R^2 (Students) = .31; R^2 (Faculty) = .23

Note. *p < .05, **p < .01, ***p < .001

Table 4

Regression Analysis – Dependent Variable: Active Participation

Independent variable	Parameter estimate	Standard error	Standardized coefficients Beta	T for Ho: Parameter=0	Prob>|T|
Students					
Ease of navigation in e-learning courses	.389	.051	.278	7.593	.000***
Previous experience with e-learning	.098	.044	.077	2.215	.027*
Adequacy of e-learning supports	.140	.052	.103	2.685	.007**

R^2 (Students) = .18; R^2 (Faculty) = .24

Note. *p < .05, **p < .01, ***p < .001

Table 5

Regression Analysis – Dependent Variable: Comfort with E-Learning Technologies

Independent variable	Parameter estimate	Standard error	Standardized coefficients Beta	T for Ho: Parameter=0	Prob>|T|
Students					
Ease of navigation in e-learning courses	.461	.036	.392	12.690	.000***
Previous experience with e-learning	.153	.031	.143	4.855	.000***
Design of e-learning courses	.206	.034	.174	6.058	.000***
Adequacy of e-learning supports	.138	.038	.120	3.665	.000***

R^2 (Students) = .18; R^2 (Faculty) = .39

Note. *p < .05, **p < .01, ***p < .001

Table 6

Regression Analysis – Dependent Variable: Adequacy of E-learning Skills

Independent variable	Parameter estimate	Standard error	Standardized coefficients Beta	T for Ho: Parameter=0	Prob>|T|
Students					
Ease of navigation in e-learning courses	.206	.025	.215	8.117	.000***
Previous experience with e-learning	.422	.022	.487	19.255	.000***
Adequacy of e-learning supports	.061	.026	.066	2.354	.019*
Design of e-learning courses	.196	.024	.203	8.256	.000***

R^2 (Students) = .39; R^2 (Faculty) = .51

Note. *p < .05, **p < .01, ***p < .001

Table 7

Regression Analysis – Dependent Variable: Enjoyment with Using E-Learning

Independent variable	Parameter estimate	Standard error	Standardized coefficients Beta	T for ho: Parameter=0	Prob>|T|
Students					
Ease of navigation in e-learning courses	.399	.038	.330	10.642	.000***
Previous experience with e-learning	.099	.033	.090	3.052	.002**
Adequacy of e-learning supports	.244	.038	.207	6.382	.000***
Design of e-learning Courses	.186	.035	.153	5.335	.000***

R^2 (Students) = .55; R^2 (Faculty) = .40

Note. *p < .05, **p < .01, ***p < .001

Table 8

Regression Analysis – Dependent Variable: Preference for E-Learning over Traditional Formats

Independent variable	Parameter estimate	Standard error	Standardized coefficients Beta	T for ho: Parameter=0	Prob>|T|
Students					
Ease of navigation in e-learning courses	.461	.053	.316	8.772	.000***
Previous experience with e-learning	.102	.045	.077	2.266	.024**
Adequacy of e-learning supports	.185	.053	.131	3.468	.001**

R^2 (Students) = .41; R^2 (Faculty) = .25

Note. *p < .05, **p < .01, ***p < .001

Table 9

Regression Analysis – Dependent Variable: Development of E-Learning Skills

Independent variable	Parameter estimate	Standard error	Standardized coefficients beta	T for ho: parameter=0	Prob>|T|
Students					
Ease of navigation in e-learning courses	.136	.031	.157	4.393	.000***
Previous experience with e-learning	.056	.027	.072	2.079	.038*
Design of e-learning courses	.179	.029	.208	6.236	.000***

R^2 (Students) = .21; R^2 (Faculty) = .29

Note. *p < .05, **p < .01, ***p < .001

Discussion

Demographic Observations

More female than male students participated in the study. This occurrence may be explained by the gender composition of the institutions involved in the study: in all three institutions, there are a number of professional programs (e.g., education, nursing, and so forth) in which there are more female students than male students. Alternately, this demographic may be reflective of those who take courses with e-learning components more generally or the fact that the majority of university students in undergraduate programs in Canada are female (Canadian University Survey Consortium, 2013).

The need to understand the prevalence of females in this study as well as their e-learning preferences goes beyond the first degree female student. In two of the universities, e-based programs are offered to working professionals. According to the literature, there are more females than men returning to university to upgrade their professional and employment skills (Carter & Salyers, 2013; Salyers, Carter, Cairns & Durrer, 2014). These students typically require the flexibility that e-based courses and programs can provide because they are the primary caregivers in families and have less time to attend face-to-face classes. Research is required into the concept of gender-specific attitudes and skills in relation to computer use and computer-assisted learning.

It is also worth reflecting on the idea that, while post-secondary students use technology widely in their lives, they seem to use technology when there is a convenience or gain such as online banking and /or for managing their lives. However, when it comes to matters such as learning in the context of a learning management system, it may be a different story. In many regards, these are platforms created to meet institutional needs.

Predictors in E-learning

As the regression analyses revealed, each of ease of navigation, course design, adequacy of e-learning supports, and previous experience with e-learning demonstrated a statistically significant predictive capacity for a positive e-learning experience. Two of these three items—ease of navigation and course design—underscore the criticality of instructional design in e-learning. While these ideas can be found in earlier e-learning literature (Zellweger, 2007, 2004), the study offers further evidence that instructional design expertise is vital to successful e-learning. As Laurillard (2013) comments, teaching today is nothing short of a design science and the need for excellence in instructional design has never been greater.

In virtually every context relevant to e-learning, the tasks of teaching (e.g., knowledge dissemination, skill development) and learning (e.g., acquiring new knowledge and skills, finding or making meaning) need to be combined with the technological aspects

of delivery (e.g., use of a learning management system). This intersection requires ongoing assessment of the needs of the faculty and the student so that appropriate supports are developed and extended (Diaz, Garrett, Kinley, Moore, Schwartz & Kohrman, 2009; Fang, 2007; Shepherd, Alpert & Koeller, 2007; Taylor & McQuiggan, 2008; Thompson, 2006). Immediacy and social presence are important characteristics of these supports. Just in time technical support delivered in user friendly ways rather than workshops and training sessions are essential in e-learning (Berge & Kendrick, 2005).

The final predictor found to be statistically significant ties to previous experience with e-learning. This finding, in many regards, aligns with the responses to the first question. E-learning experience and e-skills play an important role in effective and positive experiences.

Emerging Recommendations and Areas for Future Research

While one could be inclined to place responsibility on the student for e-learning success, this would be short sighted. Both faculty members and the institution have responsibilities to carry out as well. Faculty, like students, need to have skills and experience levels equal to or greater than their students. Moreover, they need to recognize that e-teaching is different from teaching in other contexts and requires careful design and preparation carried out, ideally, with one or more colleagues with design expertise. Finally, e-learning requires ongoing support and this is where the university itself comes in. Institutional support for the vision of e-learning as well as just in time pedagogical and technical services sit at the heart of effectiveness in e-learning. Based on findings from this study, the following recommendations are offered:

1. Involve interprofessional teams of instructional designers, faculty, and individuals who support information technology in the development of e-learning courses to increase the likelihood of success. While this may seem like an intuitive strategy, many universities may not have invested adequate institutional resources to support e-learning initiatives.
2. Evaluate the technical abilities, preferences, and experiences of students in order to design effective e-learning opportunities for them. Assumptions regarding the technical skills and savvy of today's university students need to be challenged. One means for doing so is through a fulsome assessment of the learners' abilities, skills, preferences, and experiences.
3. Establish design, navigation, pedagogy, and resources standards so that students develop comfort with e-learning environments and adequate e-learning skills for success.
4. Develop and align e-learning strategies with academic and institutional strategic plans so that high quality e-learning courses are being delivered. Further, individuals responsible for academic planning and oversight should be involved in leading e-learning initiatives in order to acquire deep understanding of the complexity of e-learning.

Looking forward, the researchers would argue that results of this study should be shared nationally and internationally: significantly, e-learning crosses borders and is proving to be a way of bringing education to those who previously may not have been able to access education. Steps are also needed to further understand faculty and student needs and to design interventions that respond to them. Replication of this study in other Canadian institutions and a non-Canadian context will uncover whether the trends in three Canadian institutions are reflective of e-learning as a broader phenomenon and how persons from different cultures approach e-learning. There is likewise a need to continue to engage e-learners and faculty in this dialogue and to investigate opportunities to work as co-researchers in e-learning.

In closing, given the uptake of e-learning at Canadian post-secondary institutions, the findings of this study are important and timely. Moreover, the findings point to areas in which additional and new research are required. Specifically, more research is required in the design, development, and delivery of exceptional e-learning experiences within institutional contexts and the human connection as supported by e-learning environments.

Limitations

There are a number of limitations in this study. First, data collected from the surveys were self-reported and may have been subject to bias although a number of steps were taken to mitigate bias including the anonymous nature of the survey. Second, because standardized instruments were not used to collect data, reliability of the results may have been affected; however, alpha reliabilities were moderately high for the student survey. To minimize the limitations of response analysis used in this study, the researchers employed descriptive statistics and triangulation to maximize the reliability and validity of the findings. Regardless of these limitations, results from this study provide additional knowledge regarding e-learning from the student perspective.

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