

Who is responsible for E-Learning Success in Higher Education? A Stakeholders' Analysis

Nicole Wagner, Khaled Hassanein and Milena Head

DeGroote School of Business, McMaster University, Canada // wagnernm@mcmaster.ca // hassank@mcmaster.ca // headm@mcmaster.ca

ABSTRACT

Successful implementation of e-learning is dependent on the extent to which the needs and concerns of the stakeholder groups involved are addressed. This paper discusses e-learning, describes the needs and concerns of the various stakeholder groups, and derives a Stakeholders' Responsibility Matrix to summarize the responsibilities of each stakeholder group. Fulfilling the responsibilities described in the Stakeholders' Responsibility Matrix will address the needs and concerns of each stakeholder groups, thereby encouraging the success of e-learning in higher education.

Keywords

E-learning, Higher education, Stakeholder analysis

Introduction

The environment of higher education is evolving. Rising costs, shrinking budgets, and an increasing need for distance education (New Media Consortium, 2007) are causing educational institutions to reexamine the way that education is delivered. In response to this changing environment, e-learning is being implemented more and more frequently in higher education, creating new and exciting opportunities for both educational institutions and students.

E-learning, or electronic learning, has been defined a number of different ways in the literature. In general, e-learning is the expression broadly used to describe "instructional content or learning experience delivered or enabled by electronic technologies" (Ong, Lai and Wang, 2004, page 1). Some definitions of e-learning are more restrictive than this one, for example limiting e-learning to content delivery via the Internet (Jones, 2003). The broader definition, which will be used for the purposes of this article, can include the use of the Internet, intranets/extranets, audio- and videotape, satellite broadcast, interactive TV, and CD-ROM, not only for content delivery, but also for interaction among participants (Industry Canada, 2001). More recently, this definition can be further expanded to include mobile and wireless learning applications (Kinshuk, Suhonen, Sutinen, and Goh, 2003; Lehner, Nösekabel and Lehmann, 2003).

The e-learning models of higher education today find their roots in conventional distance education. Initially introduced to allow individuals in remote and rural areas to gain access to higher education, distance learning has evolved significantly over time. Technological advancement has been the major inspiration for change, beginning with the integration of radio broadcasting in the 1920's (Huynh, Umesh and Valachich, 2003). More recently, the advent of the Internet has enabled tremendous innovation in the delivery of post secondary education (Gunasekaran, McNeil and Shaul, 2002; Teo and Gay, 2006). As time goes by, more and more people gain access to the Internet, the cost of computer ownership decreases, and overall computer literacy increases (Huynh et al., 2003). These trends provide educational institutions an ideal channel for the delivery of educational content.

Dimensions of E-Learning

The extent of e-learning technology use in course delivery varies widely. The variations in the configuration of e-learning offerings can be described through a number of attributes, as listed in Table 1 below. These attributes can be classified into the dimensions of synchronicity, location, independence, and mode. An e-learning course component can be described by indicating which one of the two attribute values from each dimension is applicable.

E-learning can be synchronous (real-time) or asynchronous (flex-time). Synchronous e-learning includes technology such as video conferencing and electronic white boards (Romiszowski, 2004), requiring students to be present at the

time of content delivery. Asynchronous applications include programmed instruction and tutorials that allow students to work through the screens at their own pace and at their own time. Most of the courses available on the Internet are based on this asynchronous model (Greenagel, 2002). Students can be involved in e-learning from distributed locations, as in distance learning, or from the same place, such as using a group support system in a classroom to work on an assignment (Gunasekaran et al., 2002). E-learning applications also differ in the levels of collaboration that they involve. Some courses are entirely independent and individual, while others incorporate some elements of group learning such as discussion forums or chat rooms. The mode of course delivery can be entirely electronic (with or without an instructor) or take a more blended approach integrating electronic and classroom delivery to varying extents. Many current e-learning offerings follow the latter mode, taking advantage of the benefits of various types of delivery (Jack and Curt, 2001).

Table 1: The Dimensions of E-Learning

Dimension	Attribute*	Meaning	Example
Synchronicity	Asynchronous	content delivery occurs at a different time than receipt by the student	lecture module delivered via email
	Synchronous	content delivery occurs at the same time as receipt by the student	lecture delivery via web cast
Location	Same place	students use an application at the same physical location as other students and/or the instructor	using a GSS to solve a problem in a classroom
	Distributed	Students use an application at various physical locations, separate from other students and the instructor	using a GSS to solve a problem from distributed locations
Independence	Individual	students work independently from one another to complete learning tasks	students complete e-learning modules autonomously
	Collaborative	students work collaboratively with one another to complete learning tasks	students participate in discussion forums to share ideas
Mode	Electronically only	all content is delivered via technology, there is no face-to-face component	an electronically enabled distance learning course
	Blended	e-learning is used to supplement traditional classroom learning	in class lectures are enhanced with hands-on computer exercises

* The definitions of these attributes are discussed in a variety of sources including (Ong et al., 2004), (Jack and Curt, 2001), and (Greenagel, 2002)

It should be noted that a single course component will consist of a single attribute value from each dimension, yet a course may contain several components, each with different attribute values. For example, some components of a course may be delivered synchronously and others asynchronously, or a course may involve some online components and some in-class components.

E-Learning Market

Given the variety of definitions of e-learning, it is difficult to estimate the size of the market. However, e-learning is believed to be the fastest growing sub-sector of the \$2.3T USD global education market, with the market for online higher education expected to grow to \$69B USD by 2015 (Hezel Associates, 2005).

There are many reasons for the growth of the higher education e-learning industry, both from the institutions' and students' perspectives. Globally, the demand for post secondary education is increasing. For example, in the United States, college enrollment among high school graduates increased from 56% in 1980 to 67% in 2003 (Morrison, 2003). In Canada, it is expected that over 70% of new jobs created will require at least some post secondary education (Industry Canada, 2001). With the limited capacity of existing classrooms at academic institutions and the prohibitive cost of building new facilities, e-learning is an attractive alternative (Werbach, 2000).

In an effort to remain competitive and maintain their market share, many traditional higher education institutions have expanded their offerings to include e-learning courses to compete with the growing number of virtual higher education institutions (Huynh et al., 2003). In doing so, they can use their brand names to expand their target market internationally in order to capitalizing on excess demand that exists in the education systems of other countries. In

addition, increasing the use of information systems within educational institutions also provides an opportunity for the organizations to reengineer their existing time and paper-intensive processes to improve their overall efficiency (Sun Microsystems, 2003).

From a student's perspective, the knowledge economy creates a great need for continuous training and upgrading of skills (Industry Canada, 2001). E-learning makes it possible for this lifelong learning to occur as a part of the student's every day life, removing the need to travel to a traditional institution or be confined to a specific class schedule.

Similar to other technology applications, the success of e-learning is dependant on the extent to which it satisfies the needs and addresses the concerns of its key stakeholders. The next section of this article contains an analysis of the key stakeholders of e-learning within the context of higher education. This analysis is then used to derive a stakeholder-to-stakeholder responsibility matrix for maximizing the chances of e-learning success within institutions of higher education, which is presented in the third section.

E-Learning Stakeholders' Motivations and Concerns

In an organizational context, a stakeholder is a constituency of an organization (Thompson and Strickland, 2001). In the same sense, the stakeholders of e-learning are those that are affected by it. While reviewing the e-learning literature during the development of this article, a list of the main stakeholder groups in the context of higher education was compiled. Each of these stakeholder groups is described in the following sections, along with their motivations to use e-learning and their concerns about it.

Students

Students are the consumers of e-learning. In the context of higher education, they are undergraduate or graduate students enrolled at a university or college.

Motivations

Students are motivated to use e-learning to gain access to higher education. For some, it may be a component of a traditional course, while for others entire courses may be entirely online. Particularly for this second group, e-learning may create access to higher education that they would not have otherwise because of geographic or time constraints (Huynh et al., 2003; Kabassi and Virvou, 2004).

Concerns

E-learning presents an entirely new learning environment for students, thus requiring a different skill set to be successful (Romiszowski, 2004). Critical thinking, research, and evaluation skills are growing in importance as students have increasing volumes of information from a variety of sources to sort through (New Media Consortium, 2007). Also, particularly in courses that are entirely electronic, students are much more independent than in the traditional setting. This requires that they be highly motivated and committed to learning (Huynh et al., 2003), with less social interaction with peers or an instructor. Students in online courses tend to do as well as those in classrooms, but there is higher incidence of withdrawal or incomplete grades (Zhang, Zhou and Briggs, 2006).

E-learning by its very nature requires a certain level of technical sophistication. This becomes less of an issue over time as computer literacy increases. For example, in Canada, increasing proportions of young adults are going to university with enrolment of students from 18 to 24 years of age rising at a faster rate than the increase in total university enrolment (Statistics Canada, 2005). The term "digital natives" has been used to describe the under 40 generation (Prensky, 2001; Prensky, 2006). Having grown up with increased use of electronics such as television and video games, and a corresponding decrease in reading, this group learns differently than older age groups. They tend to have "a more fragmented sense of time, a reduced attention span" (Woodill, 2004, page 11) and as a result are usually disappointed and bored with mundane e-learning applications. Simulations and digital game-based learning

may be better suited for this group. Research has linked higher levels of interactivity and learner control with increased student satisfaction in e-learning (Zhang et al., 2006).

Instructors

In e-learning, as in traditional classroom learning, instructors guide the educational experiences of students. Depending on the mode of e-learning delivery, instructors may or may not have face-to-face interaction with their students.

Motivations

Instructors may be motivated to use e-learning in their courses for a variety of reasons. For example, they may be encouraged or pressured by their institutions; they may wish to reach a broader audience of students; or they may have an interest in the benefits of technology mediated learning.

Concerns

E-learning technologies bring as much change to instructors as they do to students, again requiring a new set of skills for success (Jones, 2003). In the e-learning environment, instructors shift from being the primary source of students' knowledge to being the manager of the students' knowledge resources (Romiszowski, 2004). For example, in a traditional classroom scenario, the instructor delivers the content to the class and responds to their questions. In contrast, in a technology only asynchronous e-learning environment, the instructor is more of a coordinator of the content, which students then peruse at their own pace (Teo and Gay, 2006). Thus, the skills that are most important for an instructor to possess may depend on the e-learning attributes of their course.

E-learning requires technical sophistication from instructors as well as students (Jones, 2003). Course administration may require instructors to learn new software applications. Especially in cases where instructors are also the content creators, use of new technology may be extensive. Studies have shown that the main challenges of technical support for e-learning initiatives include lack of knowledge of how to alter instructional design to be effective for courses with technology and lack of confidence in using these applications to teach (Arabasz and Baker, 2003).

Instructors may also be concerned with the acceptance of e-learning tools among their students. Studies have found that perceived usefulness and perceived enjoyment are very important for the adoption of e-learning applications by students (for example: Mahmud, Dahlan, Ramayah, Karia and Asaari, 2005; Lee, Cheung and Chen, 2005). In order to increase perceived usefulness and enjoyment, instructors should vary the types of content, create fun, provide immediate feedback, and encourage interaction to increase acceptance (Lee et al., 2005).

The amount of time that it takes instructors to create and administer e-learning courses is another important consideration. While some promote that the delivery of e-learning courses is less labour intensive, a 2003 study found that faculty and support staff spent almost twice as many hours providing online versions of courses compared to traditional delivery (Doughty, Spector and Yonai, 2003). Unless incentives are provided to encourage instructors to use e-learning technology, resistance to additional workload is likely to occur.

Educational Institutions

Educational institutions, in the context of higher education, include colleges and universities. In addition to the traditional list of postsecondary institutions, the rise in popularity of e-learning has led to the creation of new, online only educational institutions.

Motivations

Educational institutions integrate technology into classrooms to facilitate lecture delivery and create new technology mediated learning opportunities for students. They provide distance learning, including e-learning, to create access to

a larger pool of students. As e-learning becomes more widely accepted and more courses are offered online, geographic boundaries between institutions and students are removed (Young, 2001).

Concerns

Often, budgetary restriction is a primary issue for institutions (Huynh et al., 2003). Tight budgets make it difficult to implement broad, campus-wide e-learning solutions. There is a tendency for individual departments to implement their own solutions, which may not be consistent with the rest of the institution (Sun Microsystems, 2003). This reduces the potential for cross-departmental efficiencies, and can make the process more complicated for faculty, staff, and students, particularly if they are involved with more than one department.

Depending on the technological infrastructure in place at an institution, the implementation of e-learning courses can involve very costly technology upgrades (Weller, 2004). E-learning systems require several components including sufficient bandwidth, course management systems, technology equipped classrooms, and adequate computer facilities for student use (Arabasz and Baker, 2003). This increase in technology generally requires a corresponding increase in support staff as well (Young, 2001).

An important consideration for institutions is how the effectiveness of e-learning offerings will be assessed. Often measurement is based on return on investment (ROI) in the technology infrastructure and course content development. While this measure is certainly relevant, it is also vital to consider effectiveness in terms of learning outcomes (Romiszowski, 2004). An e-learning exercise can only be considered effective if learning took place. The tendency of organizations to focus on ROI can encourage cheaper program development, at the expense of learning effectiveness (Weller, 2004).

Resistance from faculty is another important concern for institutions. Many faculty members firmly believe that e-learning is inferior to face-to-face instruction (Huynh et al., 2003). Studies have shown, however, that there is no significant difference between the performance of students in the two methods (Huynh et al., 2003). The additional time required to administer e-learning courses, discussed above, may also contribute to resistance from faculty.

Acceptance of online education by employers is also a significant concern for institutions. If employers are less likely to hire students with online degrees, then students will be less likely to enroll in those degrees. Thus it is in the institutions best interest to encourage the acceptance of this form of education among potential employers.

Content Providers

In the higher education context, online course content may be created by instructors or acquired from external sources. The growth in e-learning has created a market for commercialized educational content creators, particularly for more introductory courses that are offered consistently at multiple institutions.

Motivations

Whether the content provider is the instructor or an external source, their motivation is to provide content modules that will result in effective learning. Commercial content providers are motivated by profit to develop content modules that are flexible enough to be readily utilized across institutions with minimal adaptation efforts.

Concerns

The main concern for content providers in e-learning tends to be intellectual capital rights (Huynh et al., 2003). Independent content providers in particular, need to ensure their retention of copy rights in order to sell their product to multiple customers.

Technology standards are another relevant concern for this stakeholder group (Teo and Gay, 2006). Content should be created in a format that will allow its utilization across various e-learning technology platforms. Failure to do so would restrict their potential target market. It is equally important to make certain that the content provided is consistent with the learning methodologies in use at various institutions and thus being more likely to result in successful learning (Greenagel, 2002). Learning can be impacted by the type of content, the learning environment, and even the characteristics of each learner (Zhang et al., 2006). E-learning content providers need to take this into consideration when developing content.

Technology Providers

Technology providers develop the technology that enables e-learning delivery. This category consists of a broad range of services, from the facilitation of individual distance learning courses, to complete Learning Management Systems (LMS) provided by companies such as Blackboard.

Motivations

Similar to content providers, technology providers are motivated to provide learning environments that will result in effective learning for students.

Concerns

Technology standards are an important consideration for this stakeholder group as well. Since educational institutions often have different solutions implemented by various departments, adherence to common standards facilitates interoperability (Young, 2001; Friesen, 2005). Constant evolution in hardware and consumer expectations creates pressure for technology providers to rush to market with new product offerings (Huynh et al., 2003). In order for these businesses to be sustainable, the cost of pursuing this constant innovation must be controlled (Dalziel, 2003).

Many industry experts attribute the shortcomings of e-learning to technological issues (Woodill, 2004). It is argued that many products are not developed on proven educational principles and thus do not take the different ways that people learn into consideration (Woodill, 2004). Similar to content providers, technology providers should provide provisions for personalizing the learning experience based on the context of learning and the characteristics of the student.

Accreditation Bodies

Accreditation bodies are organizations that assess the quality of education institutions offerings. Those institutions meeting the minimum requirements will be accredited, providing them a level of credibility that non-accredited institutions will not possess.

Motivations

As the proportion of education delivered by electronic means grows, it is increasingly important for accreditation bodies to encompass e-learning in their standards. Neglecting to do so will limit the relevance of their accreditation since it will only be relevant to the traditional education component of educational institutions' offerings.

Concerns

The growth of e-learning presents new challenges for accreditation bodies. As the number of learning institution grows in an attempt to capitalize on the excess demand for higher education, accreditation bodies have an increasing number of institutions seeking their approval. This increase in volume of work is combined with a change in the nature of the work that these bodies do. The Council for Higher Education Accreditation (CHEA) in the United

States defines distance learning as educational or instructional activity that is delivered electronically to students at a distance (CHEA, 2002b). By this definition, all distance learning (including e-learning) is subject to the same accreditation and securitization.

In order for e-learning courses and degrees to be taken seriously within higher education and by employers, it is very important that proper accreditation processes exist for their evaluation. Accreditation bodies recognize that there are unique considerations for evaluating e-learning. The three major concerns are: alternative design of instruction, alternative providers of higher education, and expanded focus on training (CHEA, 2002a). These areas involve issues such as the appropriateness of subject matter, the technology platform and teaching methodology chosen, technical support for faculty and students, and many more.

Employers

Employers, in this context, are those organizations that will potentially hire graduates of higher education institutions. Often, there is a tendency for employers to view online education from reputable traditional institutions in a more positive light; however the acceptance of online degrees in general is increasing (Chaney, 2002). This is a positive trend for e-learning in general and for completely online educational institutions in particular.

Motivations

Employers are increasingly motivated to consider e-learning as a higher education alternative. Denying the value of e-learning will restrict their pool of potential hires. It will also limit the availability of courses and professional development activities that their employees may participate in.

Since many students pursue higher education for the purpose of beginning or advancing their careers, a lack of support for e-learning by employers could deter employees from pursuing their coursework through electronic means, thereby restricting their opportunities.

Concerns

One issue that employers have with e-learning is the decreased interpersonal interaction inherent in many of these courses. Employers typically rank technical skills and expertise from 6 to 8 on a scale of 10, and rank interpersonal skills to be of higher importance (Gunasekaran et al., 2002). Some feel that while e-learning may be suitable for delivering content, it may not be capable of developing these interpersonal skills that employers value so highly.

E-Learning Stakeholders' Responsibility Matrix

The various stakeholders in higher education e-learning interact with one another in a variety of ways. The success of e-learning is thus dependant on the cooperation of all of those stakeholder groups. Consequently, each stakeholder group has responsibilities towards the other stakeholders to help fulfill their motivations and address their concerns. Taking into consideration the needs and concerns of each stakeholder group as discussed above, we developed a Stakeholder Responsibility Matrix, as shown in Table 2 (below). This matrix outlines the actions that each stakeholder group should take in order to address the motivations/needs and concerns of the other groups. In populating this matrix, we relied on our knowledge of the e-learning literature in addition to the experience of the first author as a former MBA student and current Ph.D. student in an environment where e-learning was available and utilized. We also relied on the experience of the second and third authors as experienced professors who have employed various forms of e-learning within their undergraduate and graduate courses over the past 9 years. Additionally, the third author has direct instructional design experience working with external content provider consultants and various accreditation bodies. The following process was followed: (i) the first author proposed an initial matrix based on extensive literature review and personal student experience; (ii) the second and third authors examined the proposed matrix independently and proposed additions and modifications; and (iii) the revised matrices (from the second and third authors) were compared for similarity and any discrepancies were discussed as a group to derive the finalized matrix. This feedback methodology using multiple expert judges is advocated by Straub (1989).

The matrix reads from left to right, indicating the responsibilities of the group down the first column to each group listed across the first row. For example, consider the obligations between Institutions and Instructors. Institutions responsibilities to Instructors include providing training in both instructional design and technology use, providing technical support, providing incentives to incorporate e-learning, and enforcing standardization to promote better technical performance. Conversely, Instructors responsibilities to Institutions centre on using the e-learning technologies available to them according to the institutions policies and standards. Fulfilling the responsibilities described in the Stakeholders' Responsibility Matrix will address the needs and concerns of each stakeholder group, thereby encouraging the success of e-learning in higher education.

Conclusion

E-learning is a large and growing market with great potential in higher education. In order to maximize this potential, e-learning implementations should endeavor to satisfy the needs and concerns of all stakeholder groups as much as possible. The Stakeholders' analysis undertaken in this paper and culminating in the Stakeholders' Responsibility Matrix is a step in that direction.

As shown in our e-learning Stakeholders' Responsibility Matrix, each stakeholder group has an important role to play while working together towards the common goal of enhancing the overall learning experience. Students and Instructors should participate as proactively as possible, provide feedback to improve future experiences, and communicate the learning possibilities that e-learning creates. Institutions should provide the technical infrastructure and support needed to enable comprehensive solutions. Content and Technology Providers should provide high quality, interoperable solutions that consider learning principles. Accreditation Bodies should provide and enforce clear guidelines for this new form of learning delivery. Employers need to recognize the validity of this form of education and work with other stakeholders to ensure that graduates meet the needs of the job market.

Institutions of higher education could utilize the stakeholders' responsibility matrix presented in this paper as a starting point when undertaking a new e-learning initiative. The stakeholders involved and their associated responsibilities could then be adapted to the nature of the particular initiative at hand. As such, the matrix will help institutions to identify the appropriate stakeholders' and develop a set of expectations for each.

Since the presented framework involves the cooperation of each stakeholder group, its implementation would entail communication between groups to ensure that the responsibilities of each group are clear. To this effect, when institutions undertake a substantial e-learning initiative they should strive to involve a cross-functional team with representation from each relevant stakeholder group. This will ensure their specific needs are addressed during development and will help to facilitate buy-in during implementation. Successful implementation also requires a project champion, who will communicate the responsibilities and the importance of cooperation to each group. It is suggested that leadership from the highest level of the institution is needed to see the opportunities available and bring them to reality (New Media Consortium, 2007). Through the effective dissemination of information, those involved in e-learning can be made aware of how they fit into the complete picture, and the importance of their specific roles in e-learning implementation success.

The framework presented in this paper is derived from the motivations/needs and concerns of stakeholder groups as noted in the literature. Future research should be conducted to validate this framework across various institution types, educational programs, and cultural settings. Since the application of the framework at an institution requires the coordination of many stakeholder groups, a case study methodology may be the most appropriate to study the application of the framework. This methodology would allow for in depth study of the success of a particular application in light of the levels of cooperation achieved according to the Stakeholders' Responsibility Matrix.

Returning to the question posed in the title of this paper: "who is responsible for e-learning success in higher education?", we have shown the answer to be a shared responsibility between the various e-learning stakeholders. When all stakeholders fulfill their responsibilities to create effective and meaningful e-learning experiences, positive outcomes extend beyond success in specific courses and programs to facilitate lifelong learning and discovery.

Table 2: E-Learning Stakeholders' Responsibility Matrix*

	Student	Instructor	Institution	Content Provider	Technology Provider	Accreditation Body	Employer
Student	<ul style="list-style-type: none"> participate in collaborative exercises to enhance learning share experiences and encourage use provide effectively designed courses incorporating e-learning content provide technical and motivational support to encourage use standardize the e-learning experience across courses provide technical support protect sensitive student information select appropriate content and media for e-learning comply with usability standards consider learning principles when designing allow adjustments for individual learning styles comply with usability standards enforce standards to ensure quality of accredited courses recognize the validity of e-learning 	<ul style="list-style-type: none"> participate proactively in exercises provide feedback regarding overall effectiveness share experiences and encourage use promote standardization provide training in instructional design and technology provide technical support provide incentives enforce standardization provide content that meets course & program needs comply with learning & usability standards consider usability and teaching principles when designing comply with learning & usability standards provide clear guidelines for requirements regarding success of graduates provide feedback regarding success of graduates 	<ul style="list-style-type: none"> use e-learning technologies according to institutional policies use e-learning technologies according to institutional policies and standards recognize e-learning credits share e-learning experiences and courses encourage standardization provide content that meets institutional needs comply with learning standards comply with standards for interoperability provide technical support and training provide clear guidelines and timely services provide feedback regarding success of graduates 	<ul style="list-style-type: none"> provide feedback regarding the appropriateness of content for e-learning ensure protection of copyrights provide feedback regarding the level of effectiveness experienced by students collectively ensure protection of copyrights provide funding for content development comply with standards for interoperability comply with standards for interoperability provide technical support provide clear guidelines for requirements provide feedback regarding relevance in workplace 	<ul style="list-style-type: none"> provide feedback regarding the effectiveness of technologies provide feedback regarding the effectiveness of technologies provide feedback to improve future versions supply appropriate infrastructure to support technology comply with standards for interoperability comply with existing standards, and collaborate to develop new standards when necessary provide clear guidelines for requirements provide feedback regarding success of graduates 	<ul style="list-style-type: none"> Demand accreditation for e-learning programs Provide feedback adhere to accreditation standards adhere to accreditation standards for quality assurance adhere to accreditation standards adhere to accreditation standards collaborate to ensure consistency ensure that standards provide appropriate measures 	<ul style="list-style-type: none"> promote the validity of e-learning during interviews educate on the validity of e-learning seek course accreditation to provide evidence for quality assurance educate on the validity of e-learning provide content relevant to work environment provide an effective learning environment to maximize learning of potential employees enforce effective standards to ensure quality of graduates share experiences and encourage acceptance of e-learning
Instructor							
Institution							
Content Provider							
Technology Provider							
Accreditation Body							
Employer							

* Matrix generated by the authors according to the procedure outlined in Section 3

References

- Arabasz, P., & Baker, M. (2003). *Respondent Summary: Evolving Campus Support Models for E-Learning Courses*, EDUCAUSE Center for Applied Research, retrieved July 1, 2007 from <http://www.educause.edu/ir/library/pdf/EKF/ekf0303.pdf>.
- Chaney, E.G. (2002). *Pharmaceutical Employers' Perceptions of Employees or Applicants with E-Degrees or Online Coursework*, Dissertation, Indiana State University, USA.
- CHEA (2002a). *Accreditation and Assuring Quality in Distance Learning. CHEA Monograph Series 2002, Volume 1*, retrieved July 1, 2007 from http://www.chea.org/pdf/mono_1_accred_distance_02.pdf.
- CHEA (2002b). *Specialized Accreditation and Assuring Quality in Distance Learning. CHEA Monograph Series 2002, Volume 2*, retrieved July 1, 2007 from http://www.chea.org/pdf/mono_2_spec-accred_02.pdf.
- Dalziel, J. (2003). Open Standards versus Open Source in e-Learning. *Educause Quarterly*, 4, 4-7.
- Doughty, P.L., Spector, M., & Yonai, B.A. (2003). Time, Efficacy and Cost Considerations of e-Collaboration in Online University Courses. *Brazilian Review of Open and Distance Learning*, retrieved March 29, 2008, from <http://www.abed.org.br/publique/cgi/cgilua.exe/sys/start.htm?UserActiveTemplate=1por&infoid=746&sid=70>.
- Friesen, N. (2005). Interoperability and Learning Objectives: An Overview of eLearning Standardization. *Interdisciplinary Journal of Knowledge and Learning Objects*, 1, 22-31.
- Greenagel, F.L. (2002). *The illusion of e-learning: why we're missing out on the promise of technology*, retrieved July 1, 2007 from <http://www.guidedlearning.com/illusions.pdf>.
- Gunasekaran, A., McNeil, R.D., & Shaul, D. (2002). E-learning: research and applications. *Industrial and Commercial Training*, 34 (2), 44-53.
- Hezel Associates (2005). *Global E-learning Opportunity for U.S. Higher Education*, retrieved July 1, 2007 from <http://www.hezel.com/globalreport/>.
- Huynh, M.Q., Umesh, U.N., Valachich, J. (2003). E-Learning as an Emerging Entrepreneurial Enterprise in Universities and Firms. *Communications of the AIS*, 12, 48-68.
- Industry Canada (2001). *The E-learning E-volution in Colleges and Universities: A Pan-Canadian Challenge*, retrieved July 1, 2007 from <http://www.cmec.ca/postsec/evolution.en.pdf>.
- Jack, Z., & Curt, U. (2001). Why blended will win. *Training and Development*, 55 (8), 54-60.
- Jones, A.J. (2003). ICT and Future Teachers: Are we preparing for e-Learning? *Paper presented at the IFIP Working Groups 3.1 and 3.3 Conference: ICT and the Teacher of the Future*, January 27-31, 2003, Melbourne, Australia.
- Kabassi, K., & Virvou, M. (2004). Personalized Adult e-Training on Computer Use Based on Multiple Attribute Decision Making. *Interacting with Computers*, 16, 115-132.
- Kinshuk, Suhonen, J., Sutinen, E., Goh, T. (2003). Mobile Technologies in Support of Distance Learning. *Asian Journal of Distance Education*, 1 (1), 60-68.
- Lee, M.K.O., Cheung, C.M.K., & Chen, Z. (2005). Acceptance of Internet-based learning medium: the role of extrinsic and intrinsic motivation. *Information & Management*, 42, 1095-1104.
- Lehner, F., Nösekabel, H., & Lehmann, H. (2003). Wireless eLearning and Communication Environment. *e-Services Journal*, 2, 23-41.
- Mahmod, R., Dahlan, N., Ramayah, T., Karia, M., & Asaari, N. (2005). Attitudinal Belief on Adoption of E-MBA Program in Malaysia. *Turkish Online Journal of Distance Education*, 6 (2), 1-10.
- Morrison, J. (2003). U.S. Higher Education in Transition. *On the Horizon*, 11 (1), 6-10.
- New Media Consortium (2007). *2007 Horizon Report*, retrieved July 1, 2007 from http://www.nmc.org/pdf/2007_Horizon_Report.pdf.
- Ong, C.-S., Lai, J.-Y., & Wang, Y.-S. (2004). Factors affecting engineers' acceptance of asynchronous e-learning systems in high-tech companies. *Information & Management*, 41 (6), 795-804.

- Prensky, M. (2001). Digital Natives, Digital Immigrants. *On the Horizon*, 9 (5), 1-6.
- Prensky, M. (2006). *Don't Bother Me Mom - I'm Learning*, St. Paul, MN: Paragon House.
- Romiszowski, A. (2004). How's the E-learning Baby? Factors Leading to Success or Failure of an Educational Technology Innovation. *Educational Technology*, 44 (1), 5-27.
- Statistics Canada (2005). *University Enrolment 2003/04*, retrieved July 1, 2007 from <http://www.statcan.ca/english/freepub/81-004-XIE/2005004/newrel.htm>.
- Straub, D. (1989). Validating Instrument in MIS Research. *MIS Quarterly*, 12 (2), 147-170.
- Sun Microsystems (2003). *E-Learning Framework*, retrieved July 1, 2007 from <http://www.sun.com/products-n-solutions/edu/whitepapers/pdf/framework.pdf>.
- Teo, C.B., & Gay, R.K.L. (2006). A Knowledge-Driven Model to Personalize e-Learning. *ACM Journal of Educational Resources in Computing*, 6 (1), 1-15.
- Thompson, A.A., & Strickland, A.J. (2001). *Crafting and Executing Strategy: Text and Readings*, New York: McGraw-Hill.
- Weller, M. (2004). Models of Large Scale e-Learning. *Journal of Asynchronous Learning Networks*, 8 (4), 83-92.
- Werbach, K. (2000). Clicks and Mortar Meets Cap and Gown: Higher Education Goes Online. *Release 1.0*, 18 (8), 1-22.
- Woodill, G. (2004). *Where is the Learning in E-learning?* retrieved July 1, 2007 from http://www.e-learningguru.com/wpapers/e-Learning_analysis.pdf.
- Young, K. (2001). The Effective Deployment of e-Learning. *Industrial and Commercial Training*, 33 (1), 5-11.
- Zhang, D., Zhou, L., & Briggs, R.O. (2006). Instructional video in e-learning: Assessing the impact of interactive video on learning effectiveness. *Information & Management*, 43, 15-27.