A look at e-learning models: investigating their value for developing an e-learning strategy

Elmarie Engelbrecht
Bureau for Learning Development, Unisa

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ABSTRACT

Planning for the implementation of quality and sustainable e-leaning programmes requires an understanding of the impact of information and communication technology on the higher education market and on current teaching and learning practices in order to identify critical success factors that have to be addressed in an e-learning strategy. New e-learning models are continually emerging as new research findings in the area of e-learning become available. E-learning models are attempts to develop frameworks to address the concerns of the learner and the challenges presented by the technology so that online learning can take place effectively. In the strategic planning process these models provide useful tools for evaluating existing e-learning initiatives or determining critical success factors. This article explores the reasons why universities are driven to implement e-learning and reviews three selected e-learning models. The aim is to identify the critical issues in the e-learning models that have to be addressed in a strategic planning process for the implementation of e-learning or the adjustment of existing e-learning initiatives.

INTRODUCTION

Universities have been confronted with numerous changes in their external and internal environments since the 1990s. They are forced to respond to emerging challenges such as the continual developments in information and communication technology (ICT); a shift in learner expectations; changing demographics of learners; the rapid development of subject knowledge and decreasing financial support (Ryan et al 2000, Alexander 2001:240).

As the Internet is fast becoming an everyday tool for business and entertainment, using the Internet for teaching and learning is becoming a normal extension. The Internet as an educational tool offers a global open platform for information storage and display in text, graphic, audio and video format as well as communication tools for synchronous and asynchronous interaction (Keegan 2000:90). E-learning in its broadest sense can be defined as instruction delivered via all electronic media including the Internet, intranets, extranets, satellite broadcasts, audio/videotape, interactive TV and CD-Rom. E-learning for the purposes of this article refers to teaching and learning that is web-enabled (Rosenberg 2001:28-29, Govindasamy 2002:288; Garrison & Anderson 2003:2).

Knowledge development in the information age is a technologically aided activity (Garrison & Anderson 2003:18). While the value of e-learning lies in its ability to train anyone, any time, anywhere, implementing and sustaining e-learning programmes require more than merely moving education and learning online (Harris 2002). Secondly, if we are to develop, deliver and administer e-learning programmes, and train educators to become competent e-learning facilitators, a high level of investment in ICT infrastructure is required. Successful e-learning implementation therefore depends on building a strategy that meets the needs of the learners and the business goals of the institution.

Many e-learning initiatives have been justified on the assumption that ICT could improve the quality of learning while at the same time improving access to education at reduced costs (Bates 1997). However, planning for the implementation of quality and sustainable e-learning programmes requires an understanding of the impact of ICT on the higher education market and on current teaching and learning practices in order to identify critical success factors that have to be addressed in an e-learning strategy. Developing an e-learning strategy is essential in setting a course that will enable a university, faculty or department to achieve predetermined goals. Without a strategic plan, short-term measurement of costs and return on investment may overshadow the longer-term benefits of e-learning as a means of producing knowledge workers (Rosenberg 2001).

PROBLEM STATEMENT

ICT infrastructure enables e-learning. E-learning technologies may save university administrators costs and add a measure of convenience for the learners, but educators may reason that if e-learning programmes do not produce knowledge workers who are capable of higher-order thinking and reasoning in solving intricate and authentic problems in the workplace, e-learning programmes are not worth much (Weigel 2002:1; Govindasamy 2002:288). In the strategic planning process to implement e-learning or adjust existing e-learning initiatives, the focus should therefore not be primarily on how ICT can be used to achieve business goals, but also on the human aspects of teaching and learning.

E-learning models provide valuable frameworks for understanding the integration of technology and pedagogy and may help to identify key disparities between the current and desired situation. Business models such as Michael Porter's five forces model or a SWOT analysis are useful in identifying internal and external environmental factors that may affect the desired future outcomes of any university, faculty or department. Using these models in the strategic planning process provides a framework for identifying critical success factors

This article explores the reasons why universities are driven to implement e-learning by using Michael Porter's five forces model and reviews three selected e-learning models. The aim is to identify the critical issues in the e-learning models that have to be addressed in a strategic planning process for the implementation of e-learning or the adjustment of existing e-learning initiatives.

THE E-LEARNING STRATEGIC PLANNING PROCESS

The first step in an e-learning strategic planning process is to fully analyse the current situation as it pertains to the ability to launch and sustain e-learning. This information is used to describe a desired situation, in other words to produce a vision statement. The statement is not about how many online courses should be offered or what technology should be used, but rather about how the university, faculty or department will be recognised and valued internally and through the eyes of learners. Once the vision has been agreed upon, the next step is to generate a mission statement to shape the actions needed to achieve the vision.

Once the vision and mission have been clearly defined, the next step in the strategic planning process is a series of analyses (external and internal environments, benchmarking and gap analyses) using different models.

Traditional business models such as Michael Porter's five forces model could be used to identify possible threats in a specific market or a SWOT analysis could be used to determine strengths, weaknesses, opportunities and threats. New e-learning models are continually emerging as new research findings become available. E-learning models are attempts to develop frameworks to address the concerns of the learner and the challenges presented by the technology that is required to implement online learning effectively. In the strategic planning process these models are useful for evaluating e-learning programmes and determining critical success factors.

On the basis of the analyses, specific strategic recommendation can be made and a plan of action implemented to achieve the vision. Periodically, organisations have to evaluate their strategies and review their strategic plans to adapt to emergent strategies and evolving changes (Rosenberg 2001; Lerner 1999).

UNIVERSITIES IN A BUSINESS CONTEXT

Corporate and academic institutions have invested in e-learning as it seems to offer possible solutions for three immediate business goals, namely:

- increasing or sustaining the quality of educational or training programmes and consequently the quality of employees/graduates
- improving access to learning opportunities
- reducing the total cost of education.

Thus, the Internet has created an unprecedented opportunity for business competitors to enter the

higher education market which has historically been dominated by universities (Watson 2000:27). In contrast to e-learning business ventures, universities are not overtly profit-oriented and therefore the pace of adoption of e-learning has been slower than in the business world (Collis & Moonen 2001:194).

To understand the impact of e-learning and include it in the strategic planning process of universities, it is necessary to analyse the current higher education market. The five forces model, developed by the business leader Michael Porter (Boyett & Boyett 1998:179), offers a framework for identifying and organising threats to the traditional university education market. The five threats are:

- First threat: Rivalry among existing competitors such as the convergence between contact and distance education institutions drives investment in e-learning. Traditional contact universities are now offering technology-enhanced distance education to offer learners convenient, flexible learning environments (Alexander 2001:240; Ryan et al 2000; Bates 1997; Collis & Moonen 2001:39).

- Second threat: The bargaining power of learners. Lifelong learning is the new philosophy of the knowledge workers in the information age and they need flexible learning to suit their mobile career and life. The convergence of contact and distance education institutions and the provision of e-learning programmes provide learners with the option to enrol at any university worldwide. In-house training or the so-called "corporate universities" or private educational institutions offer accredited e-learning programmes to learners who do not meet the requirements of universities and are therefore excluded.

- Third threat: The bargaining power of suppliers. Universities invest in e-learning in the hope of serving more learners with less expenditure. In particular, university administrators view the investment in e-learning as a long-term saving on building costs and manpower (Weigel 2002:32). Many universities have formed partnerships with other universities or consortiums in order to serve more learners with a lower outlay of resources. Universities also form partnerships with private companies whose primary business is not education, but rather technology, software, content or any other resource provision.

  Another trend is to outsource teaching services, in other word to use part-time or contract lecturers whose remuneration is lower than that of full-time faculty members and who do not receive any benefits (Weigel 2002:35). While universities reward lecturers for their research output (published articles in refereed journals, conference papers, etcetera), effective teaching is not generally rewarded in any way (Errington 2001:33). It is therefore understandable that lecturers tend to focus on research rather than on teaching.

  In the traditional university learning environment lecture materials are recycled from one year to the next. In the e-learning environment the content of learning programmes has commercial value and such programmes contribute to the trend of "commoditization of instruction". The word "commoditization" refers to the process whereby products or services become so standardised that their attributes are roughly the same (Weigel 2002:35).

- Fourth threat: The risk of new competition entering the industry. The e-learning market is a complex of technology companies offering e-learning platforms, content providers offering learning materials, and service providers offering technical support. Some companies offer an integrated e-learning service. Some examples are DigitalThink (http://www.digitalthink.com/) and Smartforce (http://www.smartforce.com/corp/marketing/) in the USA and eDegree (http://www.edegree.co.za) in South Africa. A company such as eDegree is an example of a university-to-employer intermediary. E-learning companies of this kind form links between universities and corporations. Many companies have their own e-learning programmes for their employees, the so-called corporate universities, offering their employees the opportunity for just-in-time training and in some cases the opportunity to earn an MBA through collaboration with an academic university (Lee 2001:20). Universities have to view collaboration with the business sector as a new market for growth.

- Fifth threat: The threat of substitutes. This threat relates to the above threat. The new buzz word for in-house training by companies is "corporate university". The corporate universities

offer courses not only to their own employees but also to their suppliers and customers and in so doing attract revenue. The best example of a corporate university is Educate.com (Dell Learning), offered by Dell Computer Corporation (http://www.learndell.com/dell/) (Clarke & Hermens 2001:256; Rosenberg 2001:203).

Many of the first e-learning programmes have failed, resulting in the failure of many e-learning technology companies. One of the major reasons given is the reluctant adoption of e-learning by learners - not because of the technology, but rather because of the failure of educators and organisations to provide quality content and to create an effective, interactive e-learning experience (Van Lee et al 2002; Pailing 2002). In order to sustain an e-learning initiative and to remain competitive in the changing higher education market, it is important to try to identify the issues that determine success.

E-LEARNING MODELS

"Learning" in the academic world emphasises broad foundational knowledge, theory and analytical skills. E-learning may be used to supplement either traditional contact education or print-based distance education or it may be a complete replacement of the traditional modes. Richards (2002:31) argues that "a distinction must be made between what may be referred to as an add-on model of e-learning and a more integrated approach which goes beyond a mere transmission or delivery of content to promote more interactive and effective learning".

It would be difficult to make this distinction, as e-learning should be based on using the technology to support a good learning experience. A good learning experience is one in which a student can "... master new knowledge and skills, critically examine assumptions and beliefs, and engage in an invigorating, collaborative quest for wisdom and personal, holistic development" (Eastmond & Ziegahn, cited by Jonassen et al 1995:7). The most valuable activity in a classroom of any kind is the opportunity for learners to work and interact together and to build and become part of a community of scholars and practitioners (Jonassen et al 1995:7).

E-learning models have evolved from classroom replication towards models that integrate technology and pedagogical issues. While the first e-learning models emphasised the role of the technology in providing content (information), delivery (access) and electronic services, more recent models focus on pedagogical issues such as online instructional design and the creation of online learning communities. The e-learning models reviewed in this article illustrate this evolution.

Content, service and technology model

E-learning went through a hype cycle triggered by technology expectations and technology vendors. It only slumped into a trough of disillusionment when the realities of e-learning became clear: educators and learners have not adopted e-learning as expected and desired learning outcomes are not being achieved (Logan 2001; Taylor 2002). In the growth and experimentation phase of e-learning in the 1990s, universities, public and corporate institutions, incited by technology learning management system vendors, based their e-learning initiatives on an e-learning model comprising three elements: service to the customer (learner), content and technology. Owing to the continuous ICT developments, the focus was primarily on the use of technology to create convenient virtual learning environments for learners to access anywhere, any time. The learning design (content development) and the training of educators and learners for online teaching and learning received less attention. Many educators and technology vendors assumed that the delivery of traditional learning content via the Internet constitutes e-learning.

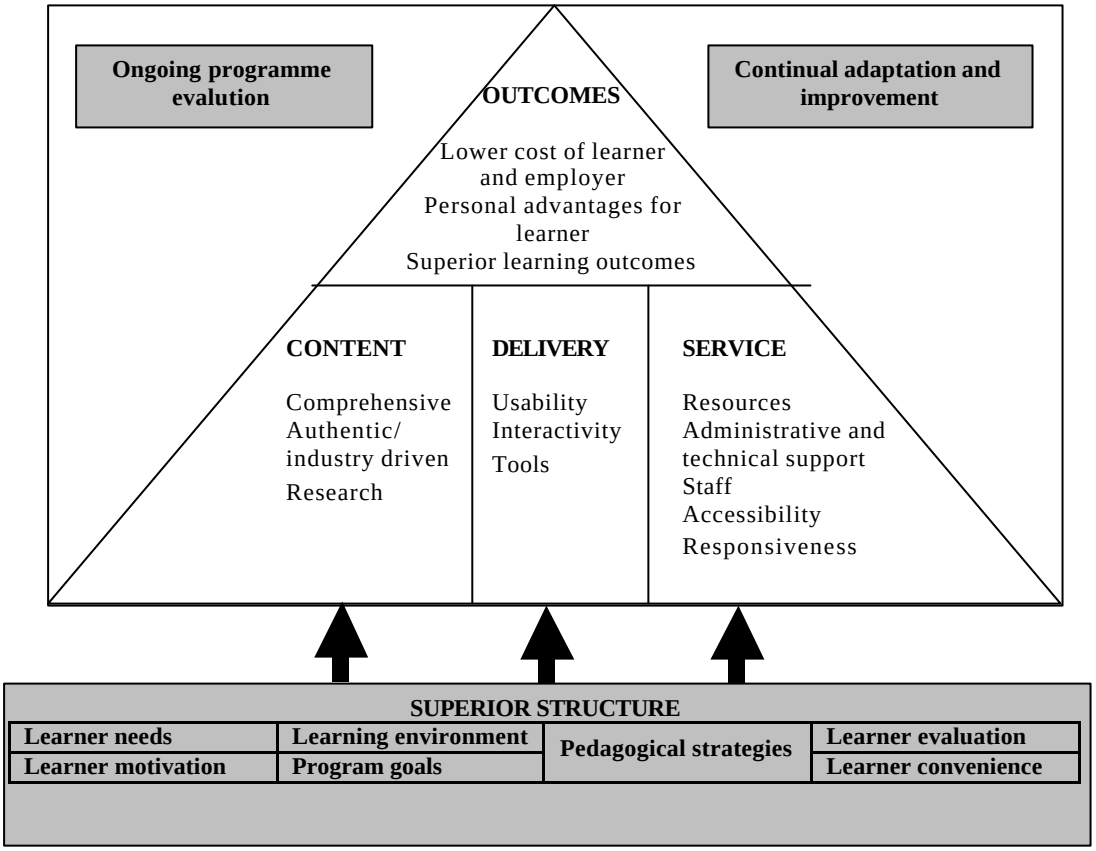

Figure 1: The demand-driven learning model (MacDonald et al 2001:19)

The demand-driven learning model (see figure 1) was developed in Canada as a collaborative effort between academics and experts from private and public industries (MacDonald et al 2001). Although this model is based on the technology learning management system vendors' model of technology, content and service, the technology is seen as support or a tool to achieve the desired learning outcomes in a cost-effective way. The primary purpose of the model is to encourage academics to take a proactive role in the development and use of technology in the teaching process. It emphasises the three consumer demands: high quality content, delivery and service. *Content* should be comprehensive, authentic and researched. *Delivery* is web-based and the interface of e-learning programmes should be user-friendly with communication tools to support interactivity. *Service* should include the provision of resources needed for learning as well as any administrative and technical support needed.

As technology is fundamental to e-learning, this model provides a valuable framework for understanding the importance of investing in ICT infrastructure to support content, delivery and service. However, this model also highlights the importance of realising the changing needs of learners and their employers and the pedagogical changes that must be made to content and services to meet these needs.

Instructional design models

One of the most crucial prerequisites for successful implementation of e-learning is the need for careful consideration of the underlying pedagogy, or how learning takes place online. Conrad (2000:11) defines effective e-learning as "... the integration of instructional practices and Internet capabilities to direct a learner toward a specified level of proficiency in a specified competency". Instructional value is added by

- customising content for the needs of the learners
- presenting outcomes-based learning objectives
- logically sequencing material to reinforce those objectives

- basing navigational options (hypertext links) on existing and desired skills and knowledge of learners
- designing objective-based, interactive learning activities that learners must complete to receive some form of evaluation.

Instructional design models for e-learning based on the processes of designing, developing and delivering curriculum material are usually closely aligned with traditional classroom learning models that specify some combination of planning, implementing and evaluation to organise and present curriculum content.

Collis and Moonen (2001) identify institution, implementation, pedagogy and technology as the key components for developing online learning materials; Jolliffe, Ritter and Stevens (2001) describe an 18-step process. Kerri Conrad's (2000) development model for an e-learning experience has 7 stages comprising 21 tasks. Sanjaya Mishra (2001) identifies seven important factors when designing an online course. Alexander (2001:240) concludes that successful e-learning takes place within a complex system involving the students' experience of learning, teachers' strategies, teachers' planning and thinking, and the teaching/learning context. However, they all emphasise the following issues:

1. Needs analysis that will investigate the following:
   - demand for instruction in the specific subject
   - demand and need for an online course
   - equivalence of an online course with face-to-face programmes
   - costs.

2. Student profiles that will identify their needs and expectations, as follows:
   - age, gender, culture and work experience
   - prior knowledge
   - prior experience with e-learning
   - goals and motivation
   - attitude towards e-learning
   - learning patterns and styles
   - computer literacy
   - access to computers and the Internet
   - affordability of e-learning.

3. Institutional support for e-learning initiatives investigates the following:
   - the vision and mission of the institution
   - lifelong learning as a goal of the institution
   - implementation costs and sustainability
   - experience of the lecturers and web designers
   - training for the lecturers
   - technological infrastructure
   - hardware and software and staff training in the systems and equipment.

4. Pedagogical choices that meet the requirements of the subject and the needs of the target learner group:
   - learning models (constructivism versus behaviourism)
   - learning objectives
   - delivery methods
   - assessment
   - interaction
   - development strategy: using individually available web tools (email, discussion groups and chat software) or an integrated course delivery software package such as WebCT or Blackboard

The instructional design models provide valuable frameworks for those responsible for developing e-learning materials. These models are valuable for strategic planning, because they emphasise the issue of quality; quality of learning materials and quality of learning support.

Learning communities

Interaction in all its forms (between and among learners, learners and educators, learners and information or content) is an essential element in the learning process (Moore 1993:20; Laurrillard 2000:137; Palloff & Pratt 1999). E-learning has the capacity to support interaction as "the true uniqueness of e-learning lies in its multidimensional forms of communication and interaction (i.e., simultaneous intimacy and distance; multirepresentational; hyper searchable) that are truly multiplicative. Learners are able to assume control and directly influence outcomes" (Garrison & Anderson 2003:115).

Lately more researchers in the field of e-learning have shifted their focus to online communication in the e-learning environment - the facilitation of online interaction, effective use of online communication tools, the adoption of online communication and methods of motivating learners to participate, etcetera (Blignaut & Trollip 2003). Most universities that were early adopters of e-learning have sorted out their technology infrastructure and electronic administrative and library services and are now addressing pedagogical issues. While educators could design their learning materials according to an appropriate instructional design model, the learners may not participate in the learning experience as expected.

The community of inquiry model developed by Garrison and Anderson (2003) is an attempt to give educators an in-depth understanding of the characteristics of e-learning and direction and guidance to facilitate critical discourse and higher-order learning through the use of e-learning. According to the authors, "institutions of higher education have slowly begun to appreciate that the content of an educational experience alone will not define quality learning but that the context – how teachers design that experience, and the interactions that drive the learning transaction – will ultimately distinguish each institution" (Garrison & Anderson 2003:4).

A community of inquiry provides the environment in which learners can take responsibility for and control of their learning through interaction and is a requisite for higher-order learning. Given the information access and communication facilities of the Internet, an e-learning environment has distinct advantages as a means of providing support to communities of inquiry to promote higher-order learning.

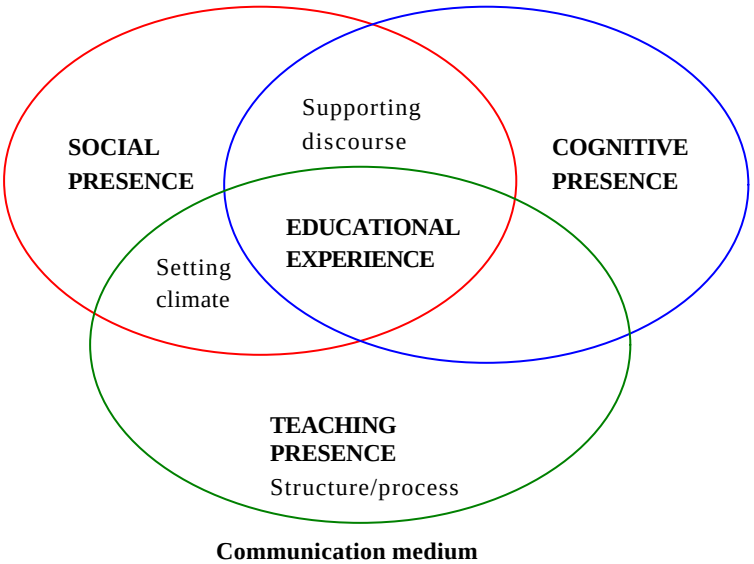

Figure 2: Community of Inquiry Model (Garrison & Anderson 2003:28)

The community of inquiry model has three key elements that must be considered when planning and delivering an e-learning experience. They are cognitive presence, social presence and teaching presence.

Cognitive presence

The authors see cognitive presence "as the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse in a critical community of inquiry. In essence, cognitive presence is a condition of higher-order thinking and learning" (p28).

Social presence

Social presence is defined as "the ability of participants in a community of inquiry to project themselves socially and emotionally, as 'real' people (i.e. their full personality), through the medium of communication being used" (p28-29).

Teaching presence

Teaching presence is defined as "the design, facilitation and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes".

The community of inquiry e-learning model builds on the demand-driven model and the instructional design models and draws attention to the complexities of communication in a virtual learning environment. Even in higher education today, the reality is that the concept of communities of inquiry that encourages learners to approach learning in a critical manner and process information in a deep and meaningful way has not been widely established. While this model may seem idealistic, the issue of interaction in the learning process has to be addressed.

CONCLUSION

Universities can no longer ignore e-learning. Computers and the Internet have become an integral part of higher education. How effectively these educational tools will be used to enhance the learning process depends on building an e-learning strategy that not only optimises the use of technology to create convenience for learners but also addresses important pedagogical issues in the information age.

The e-learning models highlight important issues that have to be evaluated and incorporated in a strategic e-learning plan: know the needs of the clients (learners and their employers), design and deliver quality learning materials, and create communities of learners for knowledge construction. An e-learning strategy should maximise technology to enhance the teaching and learning process. As Internet access is becoming a given, competition among universities will be on the quality of the learning experience: quality online learning programmes supported by online information, administrative, and technical support services.

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ABOUT THE AUTHOR

Elmarie Engelbrecht holds a BBibl(Hons) and a Masters in Information Technology from the University of Pretoria. She is employed in the Bureau for Learning Development at Unisa as an ICT specialist. Her special interests are in the field of information and communication technology for education and computer- and information literacy.
engele@unisa.ac.za