E-Learning
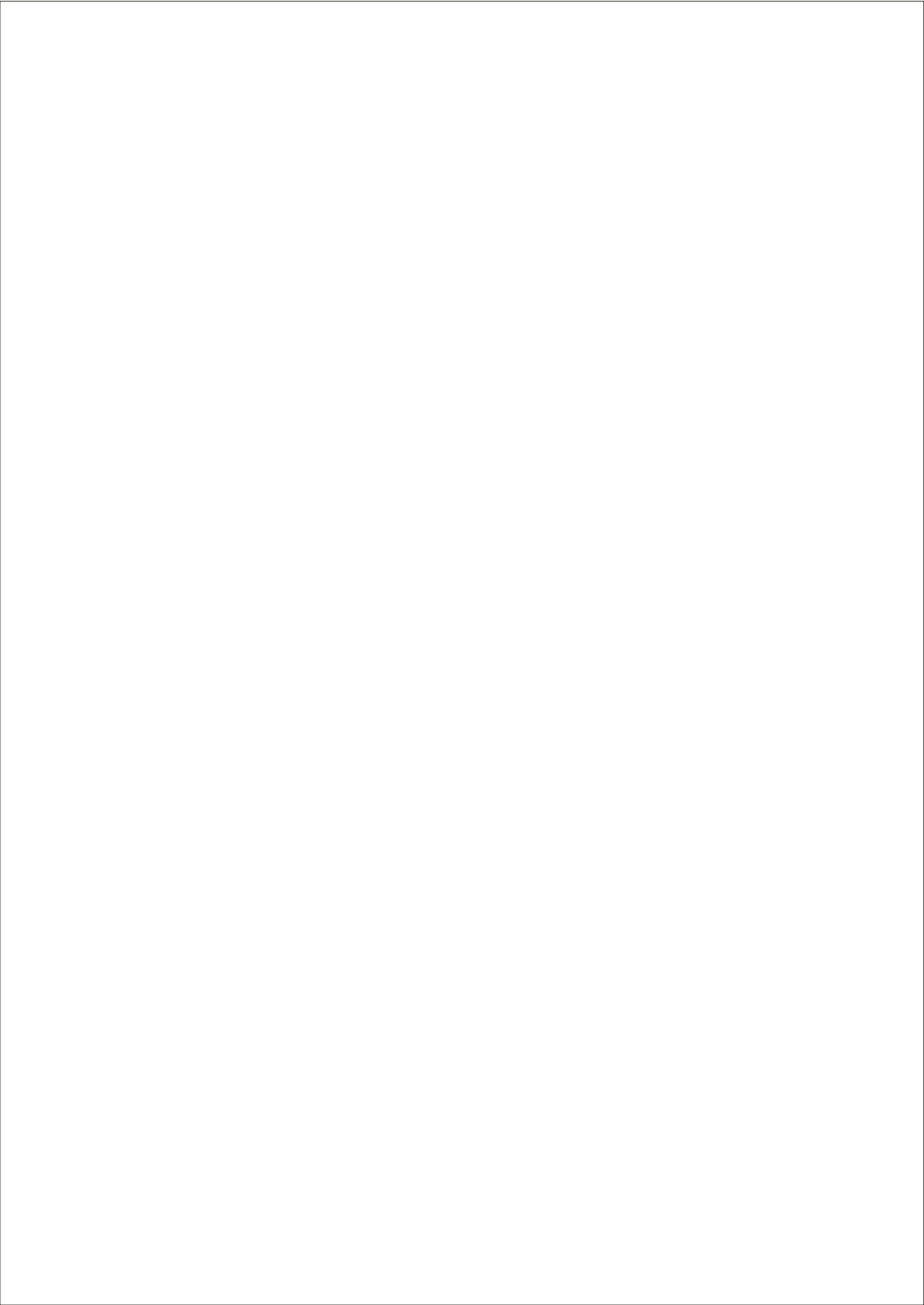## A Guidebook of Principles, Procedures and Practices

SOM NAIDU

COMMONWEALTH *of* LEARNING
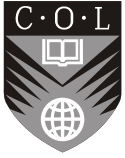
Commonwealth Educational Media Centre for Asia

E-Learning

A Guidebook of Principles, Procedures and Practices

SOM NAIDU

Contents

Foreword

Change appears to be the only constant in the field of information and communication technologies and what was avant-garde two years ago is today passé. If coping with such rapid change in the field is getting increasingly difficult and complex, it is even more difficult when one tries to simplify the concepts and processes and help academics and educators who have to grapple with effective educational delivery.

In 2003, we brought out the first version of our little book on E-Learning. It was an outcome of our explorations and experimentation and intended as a primer for those who seek to venture into a new field. It was a matter of great satisfaction when I found that we had gone through two print runs and our own analysis of our website showed that three years after it was published, it attracted more than 400 downloads in a month.

Pleasantly surprised, I re-read the book. When I then compared it to the developments in the field, I was convinced that the book, while remaining relevant, needed to be revised and updated, taking into account the feedback we had received, our own experience at using it in training programmes, and most important, that the field of e-learning, online learning and open educational resources (OER) had undergone a sea change in these three years.

To review, update and refresh the book, we commissioned the original team of Dr. Som Naidu, Associate Professor at the University of Melbourne, Australia, and Dr. Sanjaya Mishra who has since become an Associate Professor at the Indira Gandhi National Open University, India. Through several discussions, face to face, and online using the latest technologies across continents, we re-wrote the book and tested the technologies that are changing the way in which education is being designed and delivered. We tested the draft in a training programme, included that feedback as well as expert reviews of content, before bringing the second edition to you.

Once again, this is neither a definitive publication nor a treatise on e-learning. It is designed to highlight the important issues, to ask the key questions and to tease the reader into independent thought so that decisions are based on sound judgment rather than wishful thinking.

In concluding, I would like to thank a large number of people, too many to be named singly, but each equally valuable in terms of their contribution to making this publication as handy and relevant as the first edition.

Dr. Usha Vyasulu Reddi
Director, CEMCA

June 2006

Preface

This guidebook will help you to systematically approach your engagement with e-learning, irrespective of the educational sector or level within which you may be working. The content of this guidebook has been carefully prepared to enable you to consider all the issues in relation to e-learning. Besides the great deal of resources in this guidebook, its unique feature is the opportunity it offers us to "*tell a story*" about our experiences in relation to the issue or subject under discussion. Telling a story enables us to pause and reflect upon, and share our experiences or connect with others in a meaningful way. These opportunities are designed to remind us of our relevant experiences, which will enable us to reflect upon our experiences and those of our colleagues. They will enable us to make better sense of what we are reading in this guidebook.

Using this guidebook

The simplest way to make the most of the content in this guidebook is to start with chapter one. However, the order of the chapters in this guidebook does not represent any particular sequence. Your engagement with e-learning like any other educational or training activity is an iterative process, and as such there is always a great deal of backtracking and forward planning involved in the process. Of course, you are free to use this guidebook in whichever way you like or in whichever way it suits your needs.

Content of the guidebook

The content of this guidebook is organized under several key chapters. Each chapter approaches its content in a similar manner. Each comprises a discussion of key principles and procedures, which are interspersed with a number of critical questions for you to reflect upon.

The content covered in the guidebook includes a comprehensive reference list on the subject, which I hope you will find useful for further reading on the subject. Many of the references are used to cite the source, or direct you to additional sources on the points that are being made. It also includes a glossary of commonly used terms on the subject. A unique feature of this guidebook is the opportunity it offers you to tell your own stories. We all have stories to tell, which we often do through our books, movies, drama and music etc. Stories comprise a powerful form of communication. I believe that a good story can engage readers in many ways and beyond what I may have imagined. I also believe that teaching and learning can be significantly enhanced with storytelling. For more on storytelling, see <http://www.elearnspace.org/blog/archives/000257.html>

We hope and expect that the discussions in this guidebook will remind you of powerful stories, which will enable you to make sense of new information, and in turn enable you to expand your knowledgebase. In that regard, we expect that this guidebook will serve as a growing resource for you and your colleagues, as long as you continue to use it.

Som Naidu, PhD
Melbourne, Australia (April, 2006)

Acknowledgements

E-LEARNING : DEFINITION, SCOPE, TRENDS, ATTRIBUTES & OPPORTUNITIES

Chapter 1

Goals

The goals of this chapter are to:

1. Explore the scope, trends, and attributes of e-learning.
2. Explore the opportunities and affordances of e-learning.

Definition and scope

E-learning is commonly referred to the intentional use of networked information and communications technology in teaching and learning. A number of other terms are also used to describe this mode of teaching and learning. They include *online learning*, *virtual learning*, *distributed learning*, *network* and *web-based learning*. Fundamentally, they all refer to educational processes that utilize information and communications technology to mediate asynchronous as well as synchronous learning and teaching activities. On closer scrutiny, however, it will be clear that these labels refer to slightly different educational processes and as such they cannot be used synonymously with the term *e-learning*.

The term e-learning comprises a lot more than *online learning, virtual learning, distributed learning, networked* or *web-based learning*. As the letter "e" in e-learning stands for the word "electronic", e-learning would incorporate all educational activities that are carried out by individuals or groups working online or offline, and synchronously or asynchronously via networked or standalone computers and other electronic devices. These various types or modalities of e-learning activity are represented in Table 1 (see also Romiszowski, 2004).

Table 1. E-Learning modalities

Individualized self-paced e-learning *online*	Individualized self-paced e-learning *offline*
Group-based e-learning *synchronously*	Group-based e-learning *asynchronously*

Individualized self-paced e-learning online refers to situations where an individual learner is accessing learning resources such as a database or course content online via an Intranet or the Internet. A typical example of this is a learner studying alone or conducting some research on the Internet or a local network.

Individualized self-paced e-learning offline refers to situations where an individual learner is using learning resources such as a database or a computer-assisted learning package offline (i.e., while not connected to an Intranet or the Internet). An example of this is a learner working alone off a hard drive, a CD or DVD.

Group-based e-learning synchronously refers to situations where groups of learners are working together in real time via an Intranet or the Internet. It may include text-based conferencing, and one or two-way audio and videoconferencing. Examples of this include learners engaged in a real-time chat or an audio-videoconference.

Group-based e-learning asynchronously refers to situations where groups of learners are working over an Intranet or the Internet where exchanges among participants occur with a time delay (i.e., not in real time). Typical examples of this kind of activity include on-line discussions via electronic mailing lists and text-based conferencing within learning managements systems.

Contemporary trends in e-learning

The growing interest in e-learning seems to be coming from several directions. These include organizations that have traditionally offered distance education programs either in a single, dual or mixed mode setting. They see the incorporation of online learning in their repertoire as a logical extension of their distance education activities. The corporate sector, on the other hand, is interested in e-learning as a way of rationalizing the costs of their in-house staff training activities. E-learning is of interest to residential campus-based educational organizations as well. They see e-learning as a way of improving access to their programs and also as a way of tapping into growing niche markets.

The growth of e-learning is directly related to the increasing access to information and communications technology, as well its decreasing cost. The capacity of information and communications technology to support multimedia resource-based learning and

teaching is also relevant to the growing interest in e-learning. Growing numbers of teachers are increasingly using information and communications technology to support their teaching. The contemporary student population (often called the "Net Generation", or "Millennials") who have grown up using information and communications technology also expect to see it being used in their educational experiences (Brown, 2000; Oblinger, 2003; Oblinger and Oblinger, 2005). Educational organizations too see advantages in making their programs accessible via a range of distributed locations, including on-campus, home and other community learning or resource centers.

Despite this level of interest in e-learning, it is not without constraints and limitations. The fundamental obstacle to the growth of e-learning is lack of access to the necessary technology infrastructure, for without it there can be no e-learning. Poor or insufficient technology infrastructure is just as bad, as it can lead to unsavory experiences that can cause more damage than good to teachers, students and the learning experience. While the costs of the hardware and software are falling, often there are other costs that have often not been factored into the deployment of e-learning ventures. The most important of these include the costs of infrastructure support and its maintenance, and appropriate training of staff to enable them to make the most of the technology (see Naidu, 2003).

Reflection

- Articulate the learning and teaching needs of your organization?

- To what extent and how is e-learning technology being utilized to meet these learning and teaching needs in your organization? If these needs are not being adequately met currently with the use of technology, why is it so?

- Reflect upon how any current efforts at meeting these learning and teaching needs with the help of e-learning technology are coping with the changing educational circumstances in your organization?

Attributes of e-learning

There is a growing body of literature on e-learning technologies (see for instance Gayeski, 1993; Gibbons & Fairweather, 1998; Kearsley, 2005; Khan, 1997); as well as a large repository of resources on the Internet including
http://thinkofit.com/webconf/;
http://osf1.gmu.edu/~montecin/platforms.htm.

In this chapter, we discuss only the critical and unique attributes of these technologies. These are: a) the flexibility that information and communications technologies afford; and b) electronic access to a variety of multimedia-based material that they can enable.

The flexibility that e-learning technology affords

A key attribute of information and communications technology is its ability to enable flexible access to information and resources. Flexible access refers to access and use of information and resources at a time, place and pace that is suitable and convenient to individual learners rather than the teacher and/or the educational organization.

The concept of distance education was founded on the principles of flexible access (Willems, 2005). It aimed to allow distance learners, who were generally adult learners in full or part-time employment to be able to study at a time, place, and pace that suited their convenience. The goal of distance education was to free these learners from the constraints of conventional residential educational settings. They would not be required to live or attend lectures in locations away from where they may be living and working. The printed distance study materials, which each distance learner received, would carry the core subject matter content they would need including all their learning activities and assessment tasks. Students would be required to complete these tasks, submit their assignments and take their examinations within a set time frame. While these printed study materials allowed distance learners a great deal of freedom from time, place and pace of study, it had its limitations. For one thing, non-printed subject matter content and simulations etc. could not be easily represented in print form.

Access to information and communications technology changed all that as it offered a range of possibilities for capturing and delivering all types of subject matter content to learners and teachers in distributed educational settings. This meant access to subject matter content and learning resources via networked information and communications technologies across a range of settings such as conventional classrooms, workplaces, homes, and various forms of community centers (Dede, 2000; 1996). Contemporary educational institutions, including conventional distance education providers, often pride themselves in being able to meet the learning needs of their students and staff at a time, place and pace that is most convenient to them.

They have been able to do this with the help of information and communications technologies which afford learners access to up-to-date information as and when they need them, and also the opportunity to discuss this information with their peers and teachers at their convenience. This is becoming increasingly affordable and palatable with a wide range of software applications and computer conferencing technologies for collaborative inquiry among students and asynchronous discussion (see Edelson, Gordin, & Pea, 1999; Edelson & O'Neill, 1994). These applications enable learners and teachers to engage in synchronous as well as asynchronous interaction across space, time, and pace (Gomez, Gordin & Carlson, 1995; Gordin, Polman & Pea, 1994; Pea, 1994).

Electronic access to hypermedia and multimedia-based resources

Information and communications technology also enables the capture and storage of information of various types including print, audio, and video. Networked information and communications technologies enable access to this content in a manner that is not possible within the spatial and temporal constraints of conventional educational settings such as the classroom or the print mode (Dede, 2000). In the context of this distributed setting, users have access to a wide variety of educational resources in a format that is amenable to individual approaches to learning (Spiro, Feltovich, Jacobson & Coulson, 1991), and accessible at a time, place and pace that is convenient to them (Pea, 1994). Typically, these educational resources could include hyper-linked material, incorporating text, pictures,

graphics, animation, multimedia elements such as videos and simulations and also links to electronic databases, search engines, and online libraries.

Reflection

- What promise do these attributes and capabilities of information and communications technology hold for your organizational needs?

Tell us a Story

- Describe a context or situation from within your organization where any one of these attributes and opportunities have been adopted? What were its successes and / or failures?

Opportunities and affordances of e-learning

A growing body of literature on learning and teaching is suggesting that learning is greatly enhanced when it is anchored or situated in meaningful and authentic problem-solving activities (see Barron, Schwartz, Vye, Moore, Petrosino, Zech, Bransford & The Cognition and Technology Group at Vanderbuilt, 1998; Brown, Collins & Duguid, 1989; Evensen & Hmelo, 2000; Naidu, 2004; Schank & Cleary, 1995; McLellan, 1996; The Cognition and Technology Group at Vanderbilt, 1990). This approach to learning and teaching is founded on the principles of learning by doing and experiencing (Schank, Fano, Jona & Bell, 1994). It places or confronts learners with authentic situations and scenarios which are motivating and which require learners to carry out tasks or solve problems and reflect upon their actions (Naidu, 2004).

While such learning designs are suited for any learning and teaching context or media, their effectiveness and efficiency can be somewhat constrained by the fixed time, space and pace limitations of learning and teaching in conventional campus-based classroom settings. Similarly, printed study materials, while they afford transportability, are limited by their inability to capture and carry much else other than text, pictures, and illustrations.

Information and communications technologies, on the other hand, afford us a wide range of opportunities to capture, store and distribute information and resources of all types and formats. Along with text, pictures and illustrations, these include multimedia-based simulations of complex processes from all sorts of domains such as the biological and medical sciences, agriculture, engineering and educational practice which are not easily or cheaply accessible in real time and settings.

Reflection

- What promise does this attribute of e-learning hold for your organizational needs?

- What advantages do you see in adopting e-learning for your organization's learning and teaching needs?

- What concerns and fears, if any, you have in the adoption of e-learning in addressing your organizations education and training needs?

Tell us a Story

- Can you think of contexts or situations where these opportunity have been adopted? What were its successes and / or failures?

An empathetic teacher would also help a lot!

I like to share my personal experience concerning online learning. I received my first degree in mathematics and a minor in Education without any online experience but then that was over 15 yrs. ago. Recently, I received my Master's in Adult Ed. and was introduced to online learning. As far as my background is concerned, I have always been apprehensive about learning online exclusively.

My position was if I have survived all these years and have accomplished my goals without it, then what was the need? However, in the last year of my Master's program, I realized it was pertinent that I pick up on this trend if I was to work with my adult clienteles effectively.

Fortunately, I had a very encouraging and non-threatening instructor who eased me into this realm. A knowledgeable instructor can help reduce much of the anxiety of getting into this intimidating mode of learning. My first online course with her was half and half. Meaning that the first half of the semester was business as usual but she introduced bits and pieces of how to use the computer. The latter half was to use technology completely. We were given guides and resources on how to gather information online and how to evaluate this information. Most importantly, she did not assume that we were all computer nerds. She provided an inviting atmosphere and we were comfortable in asking basic questions such as copy and paste, sending and opening attachments etc.

After this course, I got the courage to take the next course under her completely online. We worked with *Blackboard* within which we built a support system that helped enrich this type of learning. Following this, the rest of my courses were completely online and I found the convenience and the autonomy beneficial to my situation. I lived an hour away from the university and had to drive 3 times/week in the evening and that was exhausting.

I believe some background and experience with information and communications technology is critical when engaging with online learning, but I know now that a well-trained and empathetic instructor is even more critical to success in online learning.

Anonymous

Points to remember

- E-learning can manifest itself in four different ways:
  - ○ Individualized self-paced e-learning online,
  - ○ Individualized self-paced e-learning offline,
  - ○ Group-based e-learning synchronously and
  - ○ Group-based e-learning asynchronously.
- E-learning may also comprise combinations of the foregoing types of activities.
- E-learning is growing in popularity in all areas and levels of education and training.
- The critical attributes of e-learning include flexibility of time, place and pace of study.
- E-learning affords opportunities to design learning environments that are authentic, situated in the learning context, and also problem-based in order to provide students with "learning by doing" experiences.

PEDAGOGICAL DESIGNS FOR E-LEARNING

Goals

The goals of this chapter are to:

1. Explore issues surrounding the influence of media on learning.
2. Describe and discuss pedagogical designs for optimizing e-learning.

Introduction

The main point of this chapter is to explore issues surrounding the influence of media (information and communications technology) on learning, and to examine pedagogical designs for optimizing e-learning. The following are the key questions in relation to an exploration of these issues. Do media influence learning? Can we differentiate the unique influences of media on learning from the influences of instructional method? How can we optimize the influences of media on learning? Do we need different pedagogical designs for e-learning? If yes, then what are those designs that can optimize e-learning?

Do media influence learning?

While it is clear that information and communications technology offers tremendous opportunities for capturing, storing, disseminating and communicating a wide variety of information, does it influence learning, and if it does, what is the nature and extent of that influence? These questions are at the heart of a longstanding debate and discussion on the influences of media on learning.

The origins of this debate and discussion on the influences of media on learning date back to the invention of radio and television. On developing a camera that used film rolls, Thomas Edison had expected that the motion picture would revolutionize education and make schooling a lot more attractive and motivating for students (Heinich, Molenda & Russell, 1993). Commentators of that time had suggested that instead of wanting to stay away from

school, students would rush back to school and not want to leave school. While we know that this did not actually happen, the moving image did influence our ability to represent many things in many different ways, in and outside of school.

Several decades after Edison's inventions, and based on the growing influence of radio, television and other media on our lives, Marshall McLuhan claimed that the "medium is the message" (McLuhan, 1964). With this aphorism, McLuhan was suggesting that each medium has characteristics and capabilities that have the potential to shape, direct and enhance our capabilities (Campbell, 2000). As such McLuhan saw media as "extensions of man" which is the subtitle of his classic book (McLuhan, 1964).

The 1960s and 70s saw growing enthusiasm in the use of computers in education. This was naturally followed by similar interest in the impacts of computers on learning with many researchers concluding that while media may have some economic benefits, they did not show any benefits on learning (Lumsdaine, 1963; Mielke, 1968). Several leading researchers of the time argued that learning and any learning gain is actually caused by the way the subject matter content is presented via a medium, rather than the medium itself (Clark & Solomon, 1986; Kulik, 1985; Schramm, 1977).

A prominent contributor to this discussion on media research - Richard Clark - has in fact proclaimed that "media will never influence learning" (Clark, 1994). He has in fact suggested that "media are mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in our nutrition" (Clark, 1983, p. 445). Clark concedes that media can have important influences on the cost and speed of learning, but argues that it is only the instructional method that can influence learning. He defines instructional method as "the provision of cognitive processes or strategies that are necessary for learning but which students cannot or will not provide for themselves" (Clark, 1994. p. 5). Clark's argument is that media is replaceable and therefore "any teaching method can be delivered to students by many media or a variety of mixtures of media attributes with similar learning results" (Clark, 1994, p. 5). Based on this claim, he put forth a challenge for anyone to "find evidence, in well designed study, of

any instance of a medium or media attributes that are not replaceable by a different set of media and attributes to achieve similar learning results for any given student and learning task" (Clark, 1994, p. 2).

However, not everyone agrees with these suggestions and claims of Richard Clark. One of these is Robert Kozma who is another prominent contributor to this discussion. Kozma reviewed relevant research on learning with media which suggests that the "capabilities of a particular medium, in conjunction with methods that take advantage of these capabilities, interact with and influence the ways learners represent and process information and may result in more or different learning when one medium is compared to another for certain learners and tasks" (Kozma, 1991, p. 179). The body of literature that Kozma reviewed supports a theoretical framework for learning which sees the learner as "actively collaborating with the medium to construct knowledge", where "learning is viewed as an active, constructive process whereby the learner strategically manages the available cognitive resources to create new knowledge by extracting information from the environment and integrating it with information already stored in memory" (Kozma, 1991, p. 179-180). In such educational settings, the medium is not inert and it does not exist independently of the learning context and the subject matter content. In fact, when it is carefully integrated into the learning experience, the medium often interacts with the instructional method to produce the intended learning outcomes for the students in a given learning context. Therefore the media used, along with the instructional method would seem to have an influence on learning. In such educational settings, it would be difficult to disentangle the discrete and unique influences of the media and the method on learning.

What is the role of media in learning?

Therefore, it is arguable that in most contemporary technology enhanced learning environments where media is skillfully integrated with the instructional method, media can and do play a very influential and critical role in learning and teaching. Some prominent examples of such educational environments are the *Jasper Woodbury Series* (see Cognition and Technology Group at Vanderbilt, 1992; 1993), and *Exploring the Nardoo* (see Hedberg,

& Harper, 1995; Harper, Hedberg, Wright & Corderoy, 1995). In these contexts, media play a critical and a very important role in achieving the intended learning outcomes for the students. They serve to motivate students with clever use of sound, pictures and animation. They are also very useful in representing contexts and situations from the real world which are harder to bring into the classroom for live demonstrations.

The majority of these learning environments such as the *Jasper Woodbury Series* and *Exploring the Nardoo* are grounded in constructivist principles of learning, and situated cognition (see Brown, Collins & Duguid, 1989; Cognition and Technology Group at Vanderbuilt, 1990). These learning environments skillfully utilize the strengths of various media attributes with powerful learning strategies such as problem solving, collaborative inquiry and critical reflection to engage learners in meaningful and motivating learning tasks. In such educational settings media take on a very important role in both learning and teaching. Learning and teaching is adversely affected when media are not skillfully integrated into the learning experiences. Conversely, learning and teaching is optimized when media have been carefully selected and applied with sound instructional strategies to serve specific learning needs in different domains of learning.

Optimizing the influence of media in learning

Skillful integration of media and instructional method (i.e., learning and teaching strategies) is critical in the optimization of the influence of media in learning. This has to do with careful selection and matching of media attributes with learning and teaching strategies. Contemporary information and communications technologies afford a wide range and variety of opportunities to re-think and re-engineer the nature of our teaching and learning practices (Gibson, 1977; Turvey, 1992). A major part of this re-engineering process includes shifts in the roles of teachers from being providers and deliverers of subject matter content to becoming moderators and facilitators of learning within the context of a learner and learning-centered approach to education.

Learner and learning-centeredness is regarded as a desirable trait in education and training generally. Learner and learning-centered

educational environments are those where the learner and the learning process is the focus of program design, development and delivery. In such educational settings, the learner — not the teacher, organization, or technology — is in charge of the learning experience.

Learner and learning-centered educational processes are defining characteristics of situated learning environments. The concept of situated learning is grounded in the principles of constructivist learning theory (Wilson, 1996). It is based on the belief that learning is most efficient and effective when it takes place within the context of realistic educational settings which are either real or contrived (see Brown, Collins & Duguid, 1989). The roots of situated approaches to education and training are traceable to the concepts of experiential learning (see Dewey, 1938), and problem based learning (see Barrows, 1994; Kohler, 1925, Koffka, 1935; Orrill, 2000). Exemplar situated learning environments use "authentic learning tasks" to immerse learners in the total ecology and culture of the subject matter that is being taught and learned, much like an apprentice carpenter is immersed in a building site with architects and experienced builders (Brown, Collins & Duguid, 1989). These so called authentic learning tasks serve to "anchor" learning and teaching activities in order to scaffold learning and cognition (The Cognition and Technology Group at Vanderbuilt, 1990).

The notions of situated learning and the use of authentic learning tasks that serve to anchor and scaffold learning and teaching are heavily dependent on the use of real-world or contrived educational activities that adequately reflect real-world settings. These sorts of educational activities are inherently complex and as such time-consuming to manage. They are harder to integrate into conventional classroom settings which are limited by the opportunities they afford to engage students in authentic real-world problem-solving. While field trips and excursions offer occasional and limited opportunities, they are not enough. Therefore many teachers and organizations refrain from engaging in situated learning activities in their classes and instead depend on approaches that are a lot more expedient and teacher and subject matter centered.

Contemporary information and communications technologies offer some reprieve from the confines and constraints of conventional classrooms. They afford us opportunities to capture and/or represent real-world scenarios for use by learners within the conventional classroom. These representations can include actual images or simulations of complex phenomena from the field which can be a lot more easily integrated into the classroom curricula. They can be used as additional resources in lieu of actual field experience, or they can form a core component of the learning experience of students as is possible in the case of goal-based or problem-based learning, case-based reasoning or scenario-based learning (see Schank, 1997). The rest of this chapter discusses a number of these pedagogical designs for optimizing the influence of media on learning in this manner.

Additional enrichment materials

Here is a paper on "Learning Theories" by a graduate student from University of Saskatchewan, Canada.

- http://www.usask.ca/education/coursework/802papers/mergel/brenda.htm

In addition, you would love this load of great stuff on theories of learning on the following sites.

- http://tip.psychology.org/
- http://tip.psychology.org/theories.html

These two websites have a list of most major Journals in Educational Technology an Distance Education.

- http://www.coe.ufl.edu/Courses/EdTech/Discipline/journals.html
- http://aera-cr.ed.asu.edu/links.html

Reflection

- To what extent are these perspectives on learning and the influence of media (information & communications technology) on learning congruent with your own views as well as with the views of those of your colleagues and peers?

Pedagogical designs for optimizing e-learning

It is widely acknowledged that the role and influence of media (i.e., information and communications technology) on learning and teaching is optimized especially when it is skillfully integrated into the educational experience (see The Cognition and Technology Group at Vanderbilt, 1991: Schank & Cleary, 1995; Schank, 1997). For this to happen we need to focus our attention foremost, on the careful design of the learning experience rather than the presentation of the subject matter content or the technology. This means careful orchestration of what the learners are going to do in the learning environment.

This concept of "learning by doing" has been popularized, among others, by Roger Schank and his collaborators and it is at the heart of pedagogical designs that stand to optimize e-learning (see Schank, 1997). These pedagogical designs include "scenario-based learning" (see Naidu, Menon, Gunawardena, Lekamge & Karunanayaka, 2005), "goal-based learning" (see Naidu, Oliver & Koronios, 1999; Schank, Fano, Jona & Bell, 1994), "problem-based learning" (see Barrows, 1994; Hmelo, Holton & Kolodner, 2000; Naidu & Oliver, 1996; Naidu & Oliver, 1999), "case-based learning" (see Lynn, 1996: Rangan, 1995; Carrol & Rosson, 2005), "learning by designing" (see Naidu, Anderson & Riddle, 2000; Newstetter, 2000), and "role-play-based learning" (see Ip & Linser, 1999; Linser, Naidu & Ip, 1999). These pedagogical designs are grounded in the principles of constructivism and situated cognition, and in the belief that learning is most efficient and effective when it is contextualized and when it is based on real-world or similarly authentic settings.

Scenario-based learning

A very good example of learning by doing is scenario-based learning. Scenario-based learning is a pedagogical design where one or more learning scenarios serve to anchor and contextualize all learning and teaching activities (see Naidu, Menon, Gunawardena, Lekamge & Karunanayaka, 2005). The scenarios in these educational settings are usually drawn from real life situations. They may be contrived but they aim to be as authentic as possible and reflect the variety and complexity that is part of real life situations. For the teacher and the tutor this scenario provides a meaningful context which can be used to explain abstract concepts, principles and procedures a lot more easily. For the learner, it serves to make learning relevant, meaningful and useful.

Typically a good learning scenario will reflect a common occurrence from the relevant field (see Naidu, Menon, Gunawardena, Lekamge & Karunanayaka, 2005). It may be a case, problem or incident that is commonly encountered in the workplace. Using such cases, problems or incidences from the workplace in the education of learners serves to more adequately prepare them for the workforce as opposed to focusing their attention on the mastery of the subject matter content. The use of such scenarios is particularly relevant and meaningful in professional education.

A typically good learning scenario will sound like a story or a narrative of a common occurrence. It will have a context, a plot, characters and other related parameters. It usually involves a precipitating event which places the learner or a group of learners in a role, or roles that will require them to deal with the situation or problems caused by the event. The roles that learners might be asked to assume are those that they are likely to play in real life as they enter the workforce. Attached to these roles, will be goals that learners will be required to achieve. In order to achieve these goals they will be assigned numerous tasks and activities, some of which may require them to collaborate with their peers and other relevant groups, if these are part of the intended learning outcomes of their subject. While these activities essentially serve as learning enhancement exercises, a selection of them could be made assessable and given a mark which would contribute to the student's final grade in the subject.

In order to attain the goals that learners are assigned in the scenario, and complete all the required activities, learners will have access to a wide range of relevant resources. These resources could include textbooks and other relevant reading material, multimedia content, and also experiences from the field of how expert practitioners have gone about solving or dealing with similar cases, situations, problems or incidences (see Schank, 1997; Schank, Fano, Jona & Bell, 1994).

The learning scenario, its accompanying learning activities, and the assessment tasks serve as essential scaffolds for promoting and engendering meaningful learning activity (see Naidu, Menon, Gunawardena, Lekamge & Karunanayaka, 2005). They also serve to contextualize learning and motivate learners who are turned off by too much focus on the mastery of the subject matter content and not enough on practical and generalizable skills. The assessment tasks and learning activities which the students are assigned are critical to the achievement of the intended learning outcomes. It is therefore essential that they are congruent with the intended learning outcomes for the subject. While they are embedded within the learning scenario they must be carefully designed and skillfully applied to direct students to the core subject matter content. By successfully completing these assessment tasks and learning activities, it is expected that learners will have accomplished the intended learning outcomes of the subject.

START OF SAMPLE SCENARIO

An example of a learning scenario

(Source: Master of Arts in Teacher Education (International) program, The Open University of Sri Lanka, Department of Education, The Faculty of Education, Nawala, Nugegoda, Sri Lanka. Course: ESP 2245 Study Guide (2004). The Teacher Educator as a Researcher: Course Team: K. A. D. C. Oliver, Indrani Talagala, Chandinie Perera, Dayalatha Lekamge, Shironica Karunanayaka, pp. 4-10).

ESP 2245 - The Teacher Educator as a Researcher

Learning Scenario: A Tight Spot - What Shall I do?

The Director of Education of the Western Province in the country was asked to submit suggestions as part of a 5-year plan regarding future developments in the school system, which the newly appointed Minister of Education would be presenting to the parliament. The Director of Education felt he was in rather a "tight spot", as he did not know where to start or what to say.

The Director of the Western Province did not wish to propose any suggestions since he knew that this task not only concerned the school system but also had a bearing on the future of the country. Therefore, he decided not to act hastily. He was aware that this request for submissions had been issued to Directors of all the provinces. Therefore, he thought it wise to seek the views of the other Directors in order to submit something as a group response.

A meeting of the Directors was arranged to discuss this directive. At the meeting it was unanimously decided to ask the Ministry for more time to consider this directive. The Director of the Southern Province proposed that each Director seeks the views of the principals of schools in their respective provinces regarding issues related to their schools. This was agreed to by everyone who was present at the meeting. The Director of the Western Province felt quite confident that he could come out of this tight spot. He promptly requested the Assistant Directors to nominate principals to represent all types of schools in the districts of the Western Province.

At the meeting of the Principals nominated by the Assistant Directors, many issues surrounding the school system were discussed. Some Principals, especially those from less developed areas argued that the resources are not fairly distributed among schools, and as a consequence they are not able to function effectively. High teacher-student ratios was another issue raised by some schools in the Province. They complained that it affected the schools' performances adversely. Some argued that the teaching methodologies used by teachers are outdated and they are unaware of the most suitable teaching methodologies. Others pointed out that the in-service advisers did not provide effective training of their teachers. They blamed the National Institute of Education for not training in-service advisers properly and adequately. There were complaints about absenteeism and stagnation seriously impacting their schools. They hoped that the five-year plan the Minister intended to present to the Parliament would be able to resolve these problems. Deterioration of discipline in schools was another serious problem that was raised at this meeting. Everyone agreed that the issue should be addressed before things got out of control.

Apart from the foregoing issues, the Director of Education found that there were many other issues in the school system that needed investigating. But to get out of the tight spot he felt he was in, and to make suggestions to the Ministry, he had to address some of the more urgent issues in the school system. But he wasn't sure where to begin and how to proceed with this task. He knew all the Directors faced the same problem so they all met again to discuss how to begin to address these issues.

At this second meeting they decided to seek the assistance of the Open University (OU). The OU had high-profile educationalists who had contributed much to education reforms that had been implemented by various governments. They also had experienced educational researchers who could be relied upon for using the right approach to address issues. The Directors felt it was appropriate to approach the OU for help.

So they approached the Dean of the Faculty of Education at the OU who agreed to undertake a study of the issues identified by the Principals. In order to carry out this task, the Dean sought the help of five of her senior lecturers and assigned to them the problems that had been identified. The Dean asked the investigation team — comprising Olivia, Indran, Disha, Dayan, and Chandi — to identify a suitable approach to carry out this task and report their findings to her. The first step in the process was to clearly identify the nature of the selected issue or problem and propose an approach for studying it.

Your role: Assume you are either Olivia, Indran, Disha, Dayan, or Chandi. You have been assigned one of the issues related to the school system. These could be any one of those issues identified by the Principals at their meeting, or one that currently is a problem in your own context. Clearly identify the issue or problem you have selected and describe the most appropriate approach for studying it.

Learning Activities

- Clearly identify the issue or a problem you intend to investigate.
- Articulate the nature and significance of the issue/problem you selected.
- Find out what experts say about approaches that would help to address the researchable issues/problems.
- Discuss with your tutor, the researchable issue/problem you selected.
- Select an appropriate approach to address the issue/ problem you selected.
- Justify your selection and reflect on why you selected this approach and not other approaches.

Assignment 1

Write a report clearly identifying:

- The issue/problem you selected.
- The nature and the significance of the issue/problem.
- The approach selected to investigate the problem with justifications for your selection and reasons for not selecting other approaches.

Learning Scenario continued …

Research Procedure 1: Coming Out of the Tight Spot

After studying the nature of their respective issues/problems related to the school system and defining them Olivia, Indran, Disha, Dayan and Chandi decided to focus their attention on the specific objectives of their investigations and review related literature. The literature review helped them understand how other countries had been addressing similar problems, and issues. Chandi who opted for an evaluation approach was busy with the front-end analysis to gather necessary information related to her problem. This exercise made the investigation team confident in dealing with the selected issues, problems very effectively.

Their next task was to prepare a detailed plan for implementing the selected approach. They had been given a short period to carry out this work, and they wanted to use that period resourcefully.

Your role: Now that you have selected an issue or problem and an approach to study that issue, you will need to review related literature or perform a front-end analysis or needs analysis and prepare a detailed plan to implement your approach to this research.

Learning Activities

- Prepare a brief report on your literature review or any front-end or needs analysis you may have carried out in preparation to carryout your investigation.
- Find out what the experts say about reviewing related literature, carrying out a front-end or needs analysis, and preparing a list of references and bibliography.
- Develop a detailed plan with time lines for implementing your investigation.

Assignment 2

Submit in brief:

- A report of your literature review or outcomes of front-end or needs analysis of the

selected issue or problem, along with a list of references, and a bibliography.

- A research plan with time lines and deliverables.

Learning Scenario continued …

Research Procedure 2: On the Track

Having drawn a research plan, Olivia, Indran, Disha, Dayan, and Chandi started developing research instruments for their investigations. They validated their instruments by pilot testing with sample populations.

The next step in the process was to select their study samples. Olivia, Indran, Disha and Dayan visited several schools to select appropriate samples to carryout their research.

Your role: You will now need to develop the research instruments you will use to carryout your study. Select your final study sample to administer the instruments you developed.

Learning Activities

- Find out what the experts say about sampling.
- Find out what the experts say about development of research instruments and validating.
- Develop an instrument or instruments for data collecting.
- Validate these instruments with a sample.
- Select a sample to study the issue/problem.

Assignment 3

Submit a report on the following activities:

- Preparation and validation of the instruments related to your study.
- Selection of the final sample to collect data to study the issue / problem you selected.

Learning Scenario continued …

Conducting Research: A Tight Spot No More!

The most significant part of the studies undertaken by the researchers of the Open University has just begun. They are now busy collecting their data and they seem to be enjoying it. They met daily to share their experiences with one another. These meetings enriched them and their thinking about their investigations. When Chandi exclaimed, "We are getting wiser and wiser every day," no one could disagree.

When they finished collecting the data, they hardly met, as they were busy individually analyzing and interpreting them. They used their various methods to analyze their data. Descriptive data needed to be analyzed differently from quantitative data.

Olivia, Indran, Disha, Dayan, and Chandi were close to submitting their report to their Dean and to the Directors of Education. Chandi was certain that the Director of Western Province would be pleased with her outcomes as the National Institute of Education, where she carried out her investigation was based in his Province. He ought to be able to make sound recommendations to the Minister regarding in-service teacher training which was the issue she had identified for her study.

Your role: You will now collect data from your sample. Analyze and interpret this data. Prepare a succinct report comprising the findings of your study and suggestions to the Minister on the issue/problem you studied.

Learning Activities

- Find out what experts say about data collection.
- Collect data from your sample population.
- Find out what experts say about analyzing and interpreting data.
- Analyze the data you have collected.
- Find out what experts say about reporting data.
- Prepare a succinct report on your investigation outlining your recommendations regarding the issue/problem you studied.

Assignment 4

Submit a report comprising the following:

- Data analysis and interpretation.
- Discussion of the findings of your study.
- Your suggestions for improvement.

Your report should contain a list of references & bibliography on the subject.

End of sample scenario

Related pedagogical designs

Other pedagogical designs that are also grounded in the concept of learning by doing include "problem-based and goal-based learning", "case-based learning", "role-play-based learning", and "learning by designing". They are different from scenario-based learning in the nature of the "precipitating event" or "trigger" in the situation. A brief discussion of each follows.

Problem-based and goal-based learning

Of all learning by doing type pedagogical designs, these two designs are in fact most similar in orientation to scenario-based learning. In problem-based learning, a problem situation serves as the context and anchor for all learning and teaching activities (see Barrows, 1994). Problem-based learning begins with the presentation of a problem to students, which can be in the form of short video clip, a picture with text, or just text. Upon encountering this problem situation, students are expected to analyze it and decide what needs to be done next. A critical feature of problem-based learning is small group problem-solving and inquiry (Hmelo, Holton & Kolodner, 2000). Students work in small groups to analyze the presenting problem, make decisions on what needs to be done next, and act upon them to resolve the problem situation satisfactorily. In so doing they will have been expected to achieve the intended learning outcomes (see Naidu & Oliver, 1996; Schank, Fano, Jona & Bell, 1994).

While problem-solving is implicit in problem-based learning, learners are not told explicitly what is their role in the problem, or what they are supposed to do as they seek to analyze the presenting problem. In goal-based learning, on the other hand, they are told very specifically what is their role in the scenario and what they are supposed to do in order to resolve the problem satisfactorily. How they go about analyzing the problem to achieve a satisfactory solution to the problem is left to their imagination and creativity (see Naidu, Oliver & Koronios, 1999; Naidu & Oliver, 1999). Both, problem-based and goal-based learning designs have been widely used in the study of medical, education and environmental sciences.

Case-based learning

In case-based learning, a case serves to provide the context and anchor for all learning and teaching activities (see Lynn, 1996: Rangan, 1995; Carrol & Rosson, 2005). Cases have been very widely used in the study and teaching of Law, Business, Accounting and Economics. In these instances, students are required to use the case to explore issues, concepts and problems that they are likely to encounter.

Cases that stand to optimize learning and teaching opportunities are those that have the richness, complexity and variety that is embedded in real life situations and encounters. It is therefore most important that the cases that are selected for study and teaching are carefully selected to match the intended learning outcomes for the subject.

Learning by designing

In learning by designing, the design task affords the essential anchor and scaffold for all learning and teaching activities (Newstetter, 2000). In this learning design students are required to engage in a learning activity which comprises conceptualizing and building something. This is a common learning and teaching activity in the study of architecture, and engineering sciences. As in goal-based learning, in the case of learning by designing, the goal is made very clear to the students. How the students chose to pursue that goal and achieve the targeted learning outcomes is left to their imagination and creativity (see Naidu, Anderson & Riddle, 2000).

Role-play-based learning

In role-play-based learning, the role-play provides the anchor and scaffold for all learning and teaching activities (see Ip & Linser, 1999; Linser, Naidu & Ip, 1999). Role-play is widely used as a valuable learning and teaching strategy in social sciences and humanities subjects where very complex processes are prevalent. This learning design comprises the playing out of identified roles by learners which is followed with reflection upon the activity and its analysis in order to focus attention on the expected learning outcomes for the study.

Reflection

- What are the promises that these pedagogical designs for optimizing e-learning might offer for learning and teaching in your educational context? What are some of the obstacles they might encounter?

Tell us a Story

- Relate an educational experience where these pedagogical designs have been applied. What were its success and failures ?

Points to remember

- Clever use of media can serve to motivate learner's interest.
- Information and communication technologies provide various opportunities for capturing and representing real-world scenarios.
- Certain media (such as video) has attributes that are especially valuable for capturing authentic contexts and situations from the real world.
- Skillful integration of media and teaching methods is critical in the optimization of learning.
- This integration can be achieved through pedagogical designs such as: scenario-based learning, problem-based learning, case-based learning, role-play based learning, and design-based learning.

Acknowledgement

The ideas in this chapter draw from work by this author that has been previously published in the following:

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ASSESSMENT, FEEDBACK, AND E-MODERATION

Goals

The goals of this chapter are to:

1. Explore principles and practices in the assessment of learning outcomes and providing feedback.

2. Describe computer-mediated communication technologies for moderating e-learning.

3. Review critical attributes of good computer-mediated conferencing and e-moderating practices.

4. Explore skills and issues related to the moderation of e-learning environments.

Assessing Learning Outcomes

Assessing learning outcomes is concerned with determining whether or not learners have acquired the desired type or level of capability, and whether they have benefited from the educational experience (i.e., have they learned, and how their performance has changed). A measure of learning outcomes requires learners to complete tasks, which demonstrate that they have achieved the standards specified in the learning outcomes. In order to ascertain the most realistic and valid assessment of performance, these task(s) have to be as similar to on-the-job conditions, that is, as authentic as possible.

A major purpose of assessment in education is the improvement of learning. When focusing on the improvement of learning, it is essential to bear in mind the congruency between the learning outcomes of a course and the measures of learning achievement. It is not uncommon to find measures of learning achievement that do not address the learning outcomes of the course. When this is the case, learner motivation in the course and their performance is adversely affected.

Learning outcomes of a course must be given careful thought as quite often, insufficient attention is paid to the learning outcomes

of a course. Without a clear set of outcomes, it is difficult to determine criteria for ascertaining whether we have arrived at the place for which we set out. While some skills and competencies are easier to assess, there are many others that are more difficult to assess and grade. Therefore a range of measures of achievement is necessary to assess the wide variety of skills and competencies that need to be acquired. In all cases however, the only fair form of assessment is one that is very transparent, with explicitly stated criteria for students. Therefore, it is important to clearly specify and communicate the basis for all assessment measures. When this is the case, assessment can serve as a powerful teaching tool.

Methods of assessment

Measures of learning achievement can be classified as either criterion or norm-referenced. A criterion-referenced measure is targeted at the criteria specified in the learning outcome. Criterion-referenced measures require learners to demonstrate presence of learned capabilities in relation to specified criteria. A norm-referenced measure compares a learner's performance against that of other learners in the cohort. This form of assessment rates student performance against the normal distribution of abilities in the population (a few excellent students, some good students, and the majority are average students).

In any learning context, a range of assessment methods may be used to determine learning achievement. These may include:

- Actual performance on an authentic site or a simulated condition such as a model.
- Oral responses which comprise verbal and/or visual presentations to questions.
- Written responses which comprise typed or hand-written responses to questions.

However, as learning becomes more collaborative, situated and distributed in its context, conventional methods of assessment of learning outcomes become inadequate. These have to be replaced with tasks and assessment procedures that can be focused on the processes of learning, perception, and problem solving. Methods that can capture some of these processes are learning logs, critical reflections and portfolios. In situated learning contexts,

assessment can no longer be viewed as an add-on to the learning and teaching process, or seen as a separate stage in a linear process of instruction and post-test. Assessment must become a continuous part of the learning process where it serves to promote and support learning.

Assessment that is designed to promote and support learning during the course of the learning and teaching process, may be seen as serving a formative purpose in that it allows skills development to be identified, reflected upon and corrected in a continuous manner. Assessment that seeks to ascertain a final measure of learning capability often at the end of a course, serves as a summative measure. A one-off sampling of students' work is not adequate to make a reliable judgment of the overall quality of their work. We need to examine student's work regularly and continuously without drowning either the students or staff in meaningless tasks.

Reflection

- A big challenge for teachers is how to make assessment as authentic and realistic as possible, and as such more meaningful and motivating for the learners.

- How can assessment be made more authentic and meaningful for the learners? Is this always possible? If not, then why not?

- How can information and communications technology be used strategically to assess learning achievement?

Tell us a Story

- Can you relate an example or experience, which reflected an attempt to develop and utilize authentic approaches to assessment, with or without the use of information and communications technology?

Best assessment practices

Principles of best practices in the assessment of learning outcomes are not hard to find. The American Association of Higher Education has sponsored the development of a set of these that are available from the Web (http://condor.depaul.edu/~acafflpc/aahe.htm). See also a paper by Linda Suskie on the topic of fair assessment practices for students (http://www.sabes.org/resources/adventures/vol14/14suskie.htm). The following are a selection of sound assessment practices drawn from these sources.

1. Assessment of learning achievement must be grounded in sound educational principles. Assessment should not be considered as an end in itself. It should be seen as an effective instrument for learning improvement, and especially because students give it so much attention. Its effective use embodies the kind of learning we value for our students. These educational principles should drive not only what we assess but also how we assess. When issues about educational principles, goals and values are overlooked, assessment becomes an exercise in measuring what is easy, rather than a process of improving learning.

2. Assessment is most effective when it reflects an understanding of learning as multidimensional, integrated, and revealed through performance over time. Learning is clearly a very complex process. It entails not only the development of knowledge and understanding in a given domain, but what learners can do with that knowledge and understanding. It also involves the development of desirable values, attitudes, and behaviors which affect academic success and performance outside the formal educational setting. Assessment should reflect these understandings by employing a diverse array of methods, including those that call for actual performance, over time so as to reveal change, growth, and increasing degrees of integration of what has been learned and taught.

3. Assessment works well when, what it seeks to improve learning and when its intentions are transparent. Assessment of learning achievement is a goal-oriented process. It entails

comparing actual performance and behavior with intended learning outcomes and expectations. Clear, shared and realistic goals are the pre-requisites for focused and useful assessment practices.

4. Assessment requires attention to the achievement of learning outcomes as well as the experiences that led to those outcomes. Teachers and students tend to place a great deal more emphasis on measures of the achievement of learning outcomes. However, to improve learning outcomes, we need to know something about students' experiences along the way. Certain assessment practices such as the use of learning logs and portfolios, for instance, can help us understand which students learn best under what conditions.

5. Assessment works best when it is continuous. Learning improvement is best supported when assessment comprises a series of activities performed over the duration of study. This may mean tracking the progress of individual students or of cohorts of students and providing them with the necessary feedback and guidance.

Reflection

- What are the challenges for the teachers in trying to achieve these goals?

- How can information and communications technology help achieve these outcomes?

Tell us a Story

- Can you relate an experience that reflected any one or more of the foregoing principles with or without the use of technology? What were the challenges encountered?

Online assessment tools

With the growth of online education, there is naturally growing interest in online assessment tools. A quick search on the Internet will reveal a great deal of information.

(see for instance:

http://www.academyinternet.com/elearning/assessment.html;

http://www.tafe.swin.edu.au/indsci/assess/tools.htm;

http://www.brainchild.com/;

http://www.articulate.com/qmlp.html?gclid=CIaAosqJzIMCFTxz
Dgod5QMO9w).

Moreover, most prominent learning management systems, such as *Blackboard* and *WebCT* come with built-in assessment tools which allow the development of questions and surveys with objective type as well as open-ended responses. These are useful in online education as they enable frequent testing and provision of feedback. However, they remain somewhat unsuited for assessing more complex learning activities such as group work and project work.

Threats to online assessment practices

With online education comes increasing problems with security and the authenticity of work that is submitted by students as part of their assessment requirements. As a result there has been growing concerns about the improper use of material from the Internet (see http://www.plagiarism.org/).

In order to combat misuse of material from the Internet, software programs such as "Turnitin" have been developed (see http://www.turnitin.com/static/home.html). This software can be integrated and used with major learning management systems such as *Blackboard* and *WebCT*.

Providing Feedback

Assessment activities are most effective when they are accompanied with feedback. From a review of research on the effects of feedback, Kulhavy (1977) concluded that while feedback can be used to correct errors in performance, feedback is more effective when it follows a student response (see also Naidu, 1994; 2003). However, Kulik and Kulik (1988) observed that feedback delivered following learners' response is beneficial only under controlled and somewhat artificial conditions. They recommended immediate feedback for conventional educational settings. Schimmel (1983) found that the amount of information in

feedback was unrelated to its effects and Bangert-Drowns, Kulik, Kulik and Morgan (1991) showed that feedback does not always increase achievement. From these general assessments of the effects of feedback, several conclusions can be drawn about feedback and the conditions of feedback in learning.

1. At the simplest level, feedback is aimed at correcting errors in understanding and performance. However, like the assessment of learning outcomes, the provision of feedback is a lot more complex process.

   - Feedback is usually designed to inform learners about the quality and/or the accuracy of their responses. This kind of feedback is specific and directly related to the performance of the prescribed task. It may be delivered directly to the learners, or mediated by information and communications technology.

   - Feedback can be directed at different aspects of learning. Some feedback is primarily designed to influence affective learning outcomes such as motivation. Others might be directed at understanding of subject matter content.

2. Feedback may differ in terms of its content which is identifiable by:

   - The amount of information proffered in the feedback;
   - The similarity between information in the feedback and that in the learning and teaching transaction; and
   - Whether the feedback restated information from the original task, referred to information given elsewhere, or provided new information.

Reflection

- What are the challenges for the teachers in trying to achieve these goals regarding feedback?
- How can information and communications technology be used to optimize the provision and impact of feedback?

Moderating online learning

Moderation of the learning process comprises supporting learning with the help of a variety of instructional interventions. It is an integral part of any educational context and is often carried out by teachers and tutors as well as students themselves. Moderation of learning can serve several purposes. One of its most important functions is the provision of feedback on learning. In online learning, where the teacher is not *in situ* during much of the learning and teaching process, moderation (or e-moderation) takes on an added degree of importance (see Salmon, 2000; 2003).

E-moderation refers to the acts of managing, facilitating and engendering group based computer-mediated communication (CMC). Such communication can be synchronous or asynchronous. In the synchronous mode, even though the participants may be physically separated from one another, the communication takes place in real time (i.e., they are logged on at the same time and reacting to each other's comments as soon as these are received). Synchronous computer-mediated communication is quite like a telephone conversation except that the communication channel in the former is normally text-based while in the latter it is voice-based. Synchronous voice-based communication that is mediated by computers is becoming possible with Voice over Internet software.

In the asynchronous communication mode, participants involved in the discussion are active (i.e., logged online) at different times, and may be separated from one another by physical distances. In the asynchronous mode, those who wish to communicate with others can do so in their own time and place without the need for face-to-face contact or being online at the same time. Users can

post messages to new or current issues in their own time where these messages are stored for others to view, comment on, and review later.

Computer mediated communication technologies

Computer mediated communications technologies that enable manage and support such group-based discussion are reviewed in the following. For a detailed review of computer mediated conferencing technologies and a discussion of their uses see Harasim (1993), Harasim, Hiltz, Teles & Turoff, (1997), Mason & Kaye (1989), Naidu (1989), Naidu, Olsen & Barrett (1994), and Rapaport (1991).

E-mail: one-to-one communication

E-mail refers to electronic communication between two individuals with the help of a suitable software application such as Yahoo mail™, Eudora™ or Microsfot Outlook™. Wherever the appropriate technology is available, email is being very widely adopted for private and personal communication, as well as for the conduct of business activities (see also Poling, 1994).

E-mail list: one-to-many communication

An e-mail list is an electronic mail facility that allows one-to-many communication via text-based email communication. Mailing lists are often used to support discussions or information exchanges on a certain subject among a group of people who are subscribed to that mailing list. Upon subscribing to the list, each subscriber gets every message that is submitted to the list. A common form of a mailing list is as a newsgroup. There are newsgroups on just about every subject you can think of. Some groups discuss only one subject, while others cover a number of different subjects.

Inter-relay chat: one-to-one and one-to-many communication

Inter-Relay Chat (IRC) or "talk" is a way of communicating electronically with people in "real time", that is, synchronously. In this mode, participants in the chat session are able to send and receive messages almost immediately. Of course, they need to be logged on at the same time (see Rapaport, 1991).

Electronic bulletin boards: one-to-many communication

Electronic bulletin boards are like good old fashion notice boards, except that the former are electronic spaces and the latter are physical spaces where you can stick a note with thumb tacks. Electronic bulletin boards are electronic spaces where you are able to post information for others to read at their own time and pace (see Rapaport, 1991).

Computer conferencing: one-to-many communication

Computer conferencing combines the functionality of electronic mail and electronic bulletin or message boards. Messages sent to a computer conference are stored in a central location rather than being distributed to individual e-mail boxes such as in a mailing list. Just as in face-to-face conference settings where participants have to move to particular rooms to hear particular speakers, participants in a computer conference are required to actively access the emails in computer conferences which will be waiting for action in that conference. Once they are logged into the conference, participants can read a response and act on it. This is asynchronous communication because a participant can respond to a message or contribute to a discussion at anytime and from any place. The messages sent to the conference are stored on the host computer from where a participant can read it, reply to it, or start a new thread (see Velayao, 1994).

Attributes of good conferencing systems

David Woolley (1996) suggested that no one computer mediated conferencing system has the potential to meet all the needs of someone. Having said that, he has put forth a number of attributes of good computer mediated conferencing systems. These are briefly reviewed in the following. For a fuller discussion of these attributes see
http://www.thinkofit.com/webconf/wcchoice.htm#goodconf

Separate conferences for broad topics

Most conferencing systems will afford this feature. Whether the discussion areas are called conferences, forums, or newsgroups, they provide a basic level of organization. Different conferences enable a focus on different subjects or topics, and allow you to

establish small discrete groups or communities who are enthusiastic about particular topics. These communities can grow to cement their interests and relationships beyond the formal educational settings.

Threaded discussions within conferences

Most conferencing software also enable posting of messages in response to other messages such that a line of responses can be traced back to the original comment. This is called "threading" and it takes the form of a hierarchical structure, in which the topic is the starting point for a series of responses that follow. Most conferencing systems offer this capability for up to two to three responses to an original thought. Threads can get lost after that which is why it is very important to impress upon participants to keep their comments focused on the topic and to start a new thread when necessary.

Informative topic list

A conference participant should be able to easily see the list of the topics in a conference and the questions or issues that need a response. At the minimum, the list of topics in a conference should show each topic's title and some indication of the amount of activity in the topic: the number of responses, date of the last response, or both. The topics should be able to be sorted in some form. Participants should always be able to go back to the beginning of a topic and follow it through to the most recent response.

Support for both frequent readers and casual browsers

A computer conference should support both, frequent reading and casual browsing. Those who wish to browse should be able to choose a conference manually and scroll through the list of topics, moving backward or forward sequentially through topics, and returning to the topic list. A frequent reader, on the other hand, should be able to move through a list of conferences, skipping topic lists entirely and getting immediately to the new, unread messages. Moreover, readers should be able to search messages by date, author, or keyword.

Access control

Publicly accessible conferences will require different types of access and control than those within the context of a formal online course. In a publicly accessible conference, a conference host or moderator will need control over who can access the conference and what level of access is allowed to participants. For example, it might be necessary to give some participants read and write permission, and others read only access. The situation in a conference within a formal course would be different as every participant there will be required to have read and write access. Moreover, the host of a conference should have good tools for managing a conference discussion, such as tools for weeding out obsolete topics, archiving those that are worth saving but no longer active, and moving a divergent thread of a topic to a new topic of its own.

E-moderation skills

While creating opportunities for learning, online learning environments also create demands on learners for new skills in managing their own learning. Being successful in such learning environments requires learners to have the ability to organize, evaluate, and monitor the progress of their learning. Not all learners possess these skills, and so they have to be taught how to take advantage of the opportunities that online learning affords. A useful way of conceptualizing key skills for managing and facilitating computer mediation conferencing has been developed by Salmon (2000; 2003). These are briefly reviewed in the following.

Forming

The first task in the moderation of an online learning environment comprises the orientation of participants for computer conferencing. At this early stage, several skills are necessary for the formation of the group. In a formal educational setting, it is very likely that most of the participants will not know each other. So it will be important to provide them with an opportunity to introduce themselves to others in the group. This will comprise explaining their academic and other interests but more importantly their specific interest in the subject. Some students will be familiar with the conventions of computer mediated conferencing, while others will not. Some may be threatened by

the technology and irritated by many of the conventions of this mode of communications. As such it may be useful to agree on some common ground rules for communicating online.

At this early stage the development of respect, tolerance and trust among the group is very important. The moderator can set the tone of the communication, and try to model those sorts of behaviors for the group to emulate. These would include things like, how much to write in each message, how frequently, and the tone of the language that might be appropriate. Some agreement at this stage on the etiquettes of communicating on the net (also known as "netiquette") would be appropriate.

Functioning

This comprises ensuring that the group is on track for completing the assigned tasks. Foremost, it will include making clear the goals and outcomes of the conference. In addition to this, providing some structure and direction for the ensuing discussions will lead to a coherent conversation on the assigned topic. Participants should be encouraged to participate responsibly, and equitably to ensure that everyone is contributing their fair share to the discussions. Participants should also be encouraged to share their ideas and opinions with group members in good faith. They ought to feel free to ask questions, and seek the opinions and support of others in the group.

Formulating skills

By this stage in the discussion, conference participants are able to build a deeper level understanding of the subject matter. Strategies to support this will include summarizing the ideas and thread of the discussion at regular intervals, asking participants to assist and check each other's understanding of complex ideas, linking theory with practice and elaborating current material with previously learned material.

Fermenting

This is starting to happen when participants are engaging more readily in debate and discussion about the central issues, challenging each other's ideas, meanings, reasoning and concepts. Any controversies in this regard need to be handled very carefully by the moderator, and students should be taught the skills to manage debates. Criticizing ideas without criticizing

people is an important but difficult skill to develop. It is important to challenge the ideas of others but it is essential that students learn not to alienate other group members in this process. For example, ideas can be challenged in subtle ways by asking questions, suggesting alternatives, asking for their reasoning and justification of arguments. Students could be encouraged to find out how the thinking and reasoning of group members' differ and how the different ideas could be integrated into a smaller set of propositions on the subject. At the end of this process, the moderator must bring the discussion to some sort of a close.

Here are some further interesting resources on issues relating to e-moderation and facilitating on-line learning discussions. Have a look at it.
http://www.lesley.edu/faculty/myoder/discuss/resources.html

Reflection

- Reflect upon how moderating in e-learning environments differs from moderating in conventional face-to-face settings.

Tell us a Story

- If you have had some experience of e-moderation, relate an experience of a strategy (or strategies) that you adopted, including its challenges and successes.

Points to Remember

- Assessment of learning outcomes is most effective when it is continuous and grounded in sound educational principles.

- Major threats to assessment practices in e-learning include the increased risks of security and plagiarism.

- Most major contemporary LMSs, are still lagging behind in the provision of effective assessment tools that can be used for a range of assessment activities.

- E-moderation skills are critical in supporting students who are studying online (both synchronously and asynchronously).

ONLINE LEARNING MANAGEMENT SYSTEMS

Chapter 4

Goals

The goals of this chapter are to:

1. Survey trends and issues in relation to online learning management systems.
2. Explore strengths and limitations of online learning management systems and how to approach their selection.

Online learning management systems

Online learning management systems are a suite of software tools that enable the management and facilitation of a range of learning and teaching activities and services. In large-scale operations, online learning management systems (or LMSs as they are commonly known) can save costs and time. In conventional educational settings, online-learning management systems can help to improve the speed and effectiveness of the educational processes, communication among learners, and also staff and students. Use of LMSs in nontraditional educational settings (such as in distance education contexts) allows organizations to maximize their value by enabling flexible access to its resources and services. A few of the widely known LMSs are: Blackboard™, WebCT™, FirstClass™, Moodle™, and Lotus Learning Space™ (http://www.studymentor.com/studymentor/).

Most online learning management systems also incorporate a learning content management system (LCMS), which is a set of software tools that enables the, storage, use and reuse of the subject matter content.

Contemporary organizations recognize that the use of online-learning management systems have the potential to significantly improve their image and value, as well as access to their services. Recent studies conducted by industry analyst Brandon Hall suggest that there has been a steady rise in the use of LMS for education and training over last few years (http://www.brandon-hall.com/).

Most LMSs will have the following features: course content delivery capabilities; management of online class transactions; tracking and reporting of learner progress; assessment of learning outcomes; reporting of achievement and completion of learning tasks; and student records management. It is likely that the next generation of LMSs will have additional features such as better collaborative learning tools and better integration with other complementary systems, and with portable and wireless (mobile-learning) devices. It is also suggested that the next generation of LMSs is going to be increasingly browser-based and less reliant on umpteen downloads or plug-ins on the user's desktop. They will have to be easier-to-use, more robust, scalable and more easily customizable. With the growing interest in the sharing of study materials, they are also likely to comply more with industry standards and with complementary systems.

Adherence to emerging standards

With the proliferation of online learning in all sectors of education and training, one of the most vital issues in the development of LMSs is going to be compliance with uniform, industry-wide standards for delivering and supporting learning and teaching materials. Proprietary learning resources (commonly known as "learning objects") generally do not operate across different platforms, making them difficult and expensive to use easily. To enable learning objects to be reused and managed across various learning management systems, the online-learning industry has embarked on initiatives for the development of industry-wide standards and specifications.

A widely known initiative in setting such industry-wide standards for the sharing of digital learning resources is SCORM (Shareable Content Object Reference Model. SCORM is a widely accepted framework for defining learning objects that has been developed by the United States Department of Defense to promote the use of digital learning objects across different learning management systems (see also http://searchwebservices. techtarget.com/sDefinition/0,,sid26_gci796793,00.html).

As these standards continue to push for wider recognition and adoption, developers of LMS and LCMS, and learning resources

who comply with their specifications are going to strengthen user confidence. See chapter 5 in this guide on "digital learning objects" and their implications for emerging LMSs.

Limitations of contemporary LMSs

[Note: The limitations of contemporary LMSs that are raised in the following segment as well as elsewhere in this chapter were first raised in a discussion paper by Dr. Kemi Jona of Cognitive Arts, a Chicago-based e-learning organization. These limitations have been adapted and reproduced here from his unpublished discussion paper titled "Learning Management Systems: A focus on management, not learning"].

One of the greatest *faux pas* of virtually all contemporary LMSs has been their tendency to emulate, as best as possible, conventional classroom-based learning and teaching practices. In beginning with conventional classroom-based practices as the standard the developers of LMSs have continued to perpetuate the many pitfalls of these educational settings. This equates to a false start for LMSs, because developers have failed to capitalize on the critical attributes of LMS tools. These include features such the flexibility it can afford, the variety of interaction it can support, and the type of study materials it can incorporate. Many contemporary LMSs tend to put learners in a rather passive role, where they can read large amounts of textual material, and engage in on-line discussions. This does not offer much more than what is possible in a conventional classroom setting. Many of these LMSs lack the tools and capability to engage learners and teachers in the development of complex cognitive and social skills, such as those that involve collaboration, professional judgment and decision-making and where there are many potential solutions, and no single straightforward answers.

There is no doubt that many of the contemporary LMSs provide excellent tools for managing learning throughout an organization, however, if not carefully used, they can actually lead to a degradation in the quality and effectiveness of learning (Jona, nd). Many LMSs comprise templates for the creation of online course content. These tools help teachers design and create courses easily and quickly in a familiar environment without the need for much training. These built-in authoring tools are fine if one needs to quickly build an online-learning environment where discussion

and debate are central to understanding and knowledge building. However, they are rather insufficient for creating online-learning courses, where there is a need to develop knowledge of subject matter such as mathematics and science, which require illustration and demonstration.

Moreover, most contemporary LMSs tend to operate as "page-turning" online which consists of a typically linear sequence of screens containing chunks of information (Jona, nd). The level of user interactivity in this activity consists of simply clicking a button or hyperlink to proceed to the next screen. Although sometimes animations, audio, or video elements are added to these sequence of screens, the underlying model of the course that is built using these tools is very uninteresting and a rather poor substitute for conventional classroom-based practices (Jona, nd).

Another feature of LMSs, which is claimed as a key benefit, is their ability to track learning activities. Most contemporary LMSs have the capability to collect, organize and report data on learners' activities. These may include data on time spent on a learning activity, when it was started and completed, and number of attempts at an assessment item. The main problem with this kind of tracking of the details of a learner's activities in an online-learning course eliminates a key benefit that this environment affords, which is the creation of a safe environment that frees students from the fear of failure and the pressure of time that is endemic of a conventional classroom. It is possible that learners who know that every time they click something is being tracked and recorded, they are probably likely to feel less comfortable experimenting, taking chances, and pushing the limits of their knowledge. It is possible that instead of learning from their own mistakes, they will work to avoid making any mistakes at all (Jona, nd).

Reflection

- Reflect upon the foregoing complaints leveled against many of the contemporary e-learning management systems.

The perfect LMS is still evolving

As users become more knowledgeable and comfortable with the use of LMS, they are beginning to demand advanced features and functionality, including support for wireless devices, better collaborative learning tools, and better content management capabilities. The next-generation of LMSs will have to have improved functionalities, customizability, flexibility, interoperability, and scalability (Jona, nd). Moreover, as users move beyond the thrills and frills of the technology, they are also focusing attention on the educational functions of the tools. This augurs well for both the developers and novice users, as it signals the development of robust learning management systems that are guided by pedagogical considerations and not by what the developers or the tools can do.

Selecting a learning management system

Selecting the right online-learning management system and achieving a successful implementation is a large undertaking. This is particularly so for organizations which have historically relied on conventional classroom-based approaches to learning and teaching. Evaluating the many associated issues that contribute to the acquisition of a comprehensive LMS and ensuring that the organizational infrastructure is able to support it is a major challenge. Fortunately, help is freely available form a variety of sources (see for instance the following:

http://www.edutools.info/ index.jsp?pj=1;
http://www.edutools.info/static.jsp?pj=8&page=HOME).

Foremost, the selection of an online learning management system needs to be an integral part of an overall strategic e-learning plan for the organization. A first step in the LMS decision-making

process is to define the learning and teaching goals of an organization and how it seeks to pursue those goals. Being clear about the values and the goals that an organization seeks to promote in relation to learning and teaching will allow one to ascertain how closely an off-the-shelf LMS aligns with those values and goals. The next step in the process is to investigate all reasonable options by seeking information from potential vendors, as each will certainly offer different features, functionality, support strategies, and costs. Once you have this information, you are in a position to ascertain the suitability of selected systems for your organizational needs.

There are several options when deciding to purchase an LMS. These include:

- Purchasing an off-the-shelf LMS and using it as is;

- Purchasing an off-the-shelf LMS and modifying it;

- Having a LMS custom-developed for your needs; and
  Developing your own LMS based on the architecture of The Open Knowledge Initiative.

Of course, the best option for anyone will depend upon their readiness, budget, how closely an off-the shelf LMS program supports their unique needs, and their overall e-learning plan. It is very likely that no single off-the-shelf LMS program will have all the features or performs all the functions required to comply a 100% with all of anyone's needs. Selecting the right LMS is very user specific and involves a series of tradeoffs between user needs, capabilities and the suppliers of the technology.

Reflection

- Reflect upon the implications (benefits and costs etc.) of adopting the use of an e-learning management system.

Tell us a Story

- Can you relate any experience (your own or that of your colleagues) in the adoption and use of an e-learning management system?

Resources on LMSs	
Learning Management Systems (LMS)	http://www.brandon-hall.com/ http://advisor.com/doc/11335
	http://www.learningcircuits.org/glossary
Methodology of LMS 2002	http://www.brandonhall.com/public/ publications/LMS2002/methodology.pdf/
	http://www.brandonhall.com/public/ publications/LMS2002/
TopClass	http://www.wbtsystems.com/
	http://gln.dcccd.edu/topclass/help/ info.html
WebCT	http://www.webct.com/
Blackboard	http://company.blackboard.com/
Virtual-U	http://www.telelearn.ca/
Developing SCORM Content	http://www.rapidauthor.com/home/ Compliant index.htm
	http://www.thecommonplace.net/forum/ messageview.cfm?catid=3&threadid=24
	http://www.readygo.com/aicc/ section under IMS contains XML script.
	http://www.maxit.com/daz_aicc_scorm_ info.html

Points to remember

- Learning management systems (LMSs) are software applications that comprise a suite of tools for learning and teaching online. Some of the widely known LMSs are: WebCT, Blackboard, Moodle.

- Most LMSs have tools for creating content (authoring tools), organizing them and delivering online. LMSs are useful for supporting communication among learners and also tracking and reporting their progress.

- A key limitation of contemporary LMSs is their tendency to emulate the conventional campus-based classroom-based learning and teaching process.

- The selection of LMS depends on strategic planning, budget, technological readiness and value systems of an organization.

DIGITAL LEARNING OBJECTS

Goals

The goals of this chapter are to:

1. Define digital learning objects and their role in e-learning and on-line learning.
2. Describe the processes of identifying and defining learning objects with metadata.
3. Describe the processes of packaging, storing and distributing digital learning objects for reuse in e-learning course design, development and delivery.

Introduction

Interest in digital learning objects is directly related to the growth of e-learning. Digital learning objects are like books, journal articles and other types of learning and teaching resources that may be found on the shelves of libraries and bookshops. However, unlike most books and journal articles that are found in libraries and bookshops, digital learning objects are stored only in electronic form, hence its association with e-learning. Digital learning objects may include anything from a set of learning outcomes, learning designs or whole courses to multimedia and other forms of resources, as long as they are kept in electronic from. Like books and journal articles, digital learning objects are catalogued and stored in learning object repositories so that they can be easily identified, searched and reused. While standards and conventions for cataloguing books and journals are widely known and adopted, the standards for cataloguing digital learning objects are still in the early stages of their development.

What is a learning object?

A "learning object" is any item that has the potential to promote learning. As such, a printed book, a journal article, or a newspaper report is a learning object. The term "learning object" is derived from object oriented programming where items of potential educational use are seen as "objects". An object in this context is

generally understood as an amalgamation of related variables and methods. Therefore, an object that can promote learning and teaching is seen as a "learning object" (see Fairweather & Gibbons, 2006).

A key attribute of learning objects is their discrete nature. Their discreteness enables learning objects to be categorized and stored independently, and reused in a range of educational settings. Developers of learning objects have used a range of descriptors to capture their discrete character. Some of these descriptors include molecular, organic or granular structure, LEGO® or Lincoln Logs® (see http://opencontent.org/docs/post-lego.pdf; http://wiley.byu.edu/post-lego/post-lego.pdf by David Wiley).

Like any other real-world object such as a car, house or a boat, a learning object will have a commonly recognizable state and behavior. A car, for instance, will have a name, make or model (which is its state), and a definition of its engine power and performance in particular settings (which is its behavior). In the same way, a learning object can have descriptors of its state and behavior. Describing and labeling learning objects accordingly will enable them to be easily and accurately identified for reuse by multiple users and in a range of educational settings. This is exactly what cataloguing systems such as the Library of Congress Classification System, and referencing conventions such as the American Psychological Association Publications Style aim to accomplish.

What is a digital learning object?

A "digital learning object" is any electronic resource that has the potential to promote learning. Typically these include scripts, images, and multimedia modules etc in digital format. They are often developed as discrete entities so that they can be reused by multiple users and in a range of educational settings.

Since the development of digital learning materials is an extremely time-consuming and expensive undertaking, the assumption is that once developed, they ought to be able to be used, reused and shared by a large number of people and in a wide range of settings.

Characteristics of learning objects

Apart from being discrete entities, learning objects are identifiable by several other notable features. For instance, learning objects

must necessarily be able to be easily *transported,* and *reused* in a variety of educational settings, otherwise there isn't much point in developing these as discrete entities. They must also be interoperable in a range of educational environments otherwise their potential for reuse is compromised, which will clearly impact their value and use.

Moreover, as interest in learning objects grows, there is likely to be a wide variety of learning objects that are developed, just as there are a wide variety of other types of learning resources that can be found in bookshops and libraries. Some of these learning objects will comprise just the content item. However, others will comprise much more than the content including expected learning outcomes, assessment items to ascertain if these learning outcomes have been achieved as well as *metadata* on the object. There will also be a wide variety of learning objects that will be developed (see http://www.e-learningcentre.co.uk/eclipse/Resources/contentmgt.htm). These would include learning objects that are factual (e.g., levels of air pollution by countries or regions in the world), procedural (e.g., procedures for reducing air pollution), principle-based (e.g., principles for minimizing air pollution), and conceptual (e.g., models for reducing air pollution).

With increasingly more detail being added to learning objects, they are likely to become more context-bound rather remain more context-independent. Moreover, as the focus on the instructional role of learning objects intensifies, there is serious danger that learning objects will begin to drive pedagogical practices rather than pedagogy driving the use of the learning resources. There is already talk of pedagogy in advance of learning objects (see for instance http://www.cc.uah.es/msicilia/CHB_CFP.pdf; http://community.flexiblelearning.net.au/GlobalPerspectives/content/article_4077.htm). Developers of learning objects will need to be aware of the advantages and disadvantages of this trade-off between context-dependence and context-independence of learning objects and the implications for their use and interoperability.

Purpose and misconceptions

It is widely acknowledged that digital learning objects (and indeed all types of learning objects) are developed to promote learning

and teaching. It has also been suggested that "the future of learning is inextricably linked to the development of quality learning objects" (McGreal, 2004, p. 14).

While there is no doubt that learning can benefit from good quality learning resource materials, high quality learning is the result of many more factors than learning objects or resources. The factors that influence learning include learner readiness, their interest and motivation in the study of the subject matter, the nature and quality of the learning experience including the nature of the assessment activities, and the nature and quality of feedback and support that is available to students. Hence it seems unwise to suggest that learning objects (digital or other) are going to determine the future of learning. Just as best selling books have not necessarily improved the quality of learning, there is no reason to assume that learning objects are going to significantly impact the quality of learning.

Identifying and defining digital learning objects with metadata

In order for digital learning objects to be easily identified and located by users, they have to be uniformly and systematically defined with *metadata*. Metadata is data about data. They are similar in type and serve the same purpose that is served by data that is found on library catalogue cards about the state and behavior of various resource items in a consistent format.

Work on the development of learning object metadata standards has been led by the Institute of Electrical and Electronics Engineers Learning Object Metadata (IEEE LOM) standards committees (IEEE, 2003; IEEE LOM, 1990). The metadata standards that have been developed by IEEE LOM standards committees have been refined and simplified by various groups including CanCore (Canadian Core) (Friesen, 2004). Other similar best practice guidelines include the Dublin Core Usage Guide, the CIMI Guide to best practice, and the online Archive of California Best Practices Guidelines. For a detailed discussion of these efforts see Friesen, Hesemeier and Roberts (2004, pp. 225-235).

While work on the development of standards for learning object metadata continues, some concerns have been expressed about the nature and direction of this work (see Friesen, Hesemeier and

Roberts (2004, pp. 232-234). Some of these concerns include:

- The relationship of best practice guidelines to the development of tools for the creation of metadata. It is suggested that these tools must be developed so that they are able to be adapted to meet the requirements of particular user groups and specific implementations.
- Partial automation of the creation of metadata. As tools for the creation of metadata are being developed, it is suggested that many of these processes can be automated via content creation tools.
- End-users need not be directly exposed to many of the structures of Learning Object Metadata. The suggestion is that it is not advisable to present less skilled end-users with all the elements for the creation of metadata.
- Learning object metadata does not offer any provisions for version control or digital rights management. Learning object metadata has elements that address some of these concerns, but these are insufficient for a proper management of issues related to intellectual property.

Processes of packaging, storing and distributing digital learning objects

Digital learning objects, once they have been appropriately classified and labeled with metadata, are best stored in learning object repositories which can enable them to be easily located, shared and reused in a variety of educational settings. Digital learning object repositories are "the libraries of the e-learning era" (Richards, Hatala & McGreal, 2004, p. 242). When made available in such repositories, digital learning objects are also open to peer-review and scrutiny which in-turn is useful for the improvement of their quality. It is unlikely, however, that a single repository will be able to house in one place all digital learning resources, just as no one library stores all the books in one location, or no one publisher publishes and distributes all the books.

Digital learning objects can be stored and made available to users in a range of ways and from a variety of locations. Therefore, it makes sense to have a "distributed" model of learning object repositories which uses network communications technologies to

distribute and share digital learning objects among repositories (see Richards, Hatala & McGreal, 2004, pp. 237). These authors also suggest that a successful digital learning object repository is one that promotes the sharing of records along with being able to facilitate access to the learning objects. Like specialist libraries, there might be learning object repositories which will specialize in housing particular types or genre of resources. Useful specialist repositories might be those that might house only "experience-based learning designs" or assessment strategies that are congruent with constructivist or collaborative learning designs. Moreover, like different libraries, these repositories may also offer different, and a wide range of services to its users.

A number of initiatives in the development of digital learning object repositories that demonstrate a distributed repository architecture have been described by Richards, Hatala & McGreal (2004, pp. 236-243). These include POOL (Portal for Online Objects in Learning), POND (a repository using the POOL protocol) and SPLASH (a desktop client that communicates with peers via the POOL protocol). Other efforts in building learning object repositories include MERLOT (Multimedia Educational Resource for Learning and Online Teaching), CAREO (Campus Alberta Repository of Educational Objects), and a growing list of Learning Content Management Systems - LCMSs (see Kestner 2004; Washburn, 1999).

Implications of an "educational object economy"

With the growth in e-learning and online learning, there is sure to be increasing interest in the development, storage, and distribution of digital learning objects. Proponents of e-learning and online learning are certain and very clear about the central role that digital learning objects and repositories will play in such educational settings.

Some claim that "the future of learning is inextricably linked to the development of quality learning objects" (see McGreal, 2004, p. 14), others see digital learning objects as the "building blocks of e-learning" (see Richards, Hatala & McGreal, 2004, p. 236), and learning object repositories as the "libraries of the e-learning era" with the potential to "fuel e-learning as the stock exchanges fuelled the industrial era" (see Richards, Hatala & McGreal, 2004, p. 242).

There are some others who are not as enthusiastic or convinced about an educational economy that is founded on the promise of digital learning objects – at least not just yet. However, these are still early days in the development, cataloguing, storing and sharing of digital learning objects. While digital learning repositories anxiously await for a critical mass of learning objects to be developed, there is no doubt that the currently limited pool of resources will grow (Ternier, Duval & Neven, 2003).

The standards for cataloguing digital learning objects with metadata are still evolving (see Richards, McGreal & Friesen, 2002). There are many problems in current practices with the lack of clarity and consistency in the definition of various attributes of learning objects such as in their level of interactivity and their context (Wiley, 2001; Mohan & Brooks, 2003). There are also unresolved issues with the location and opportunities for viewing suitable items from a digital learning repository as is possible in libraries (see Mohan, 2004).

A critical issue in the development, storage and sharing of digital learning objects is related to how academics and developers of such material view academic work and intellectual property issues related to it. Traditionally academic output in the form of publications (journal articles and books etc) has been handled by commercial publishers according to longstanding publication and distribution practices. However, conventions in relation to the production, distribution and sale of digital learning objects are still unclear and emerging. For instance, there are concerns about the rewards to academics and developers for developing learning objects and sharing these across repositories. Making them freely available in repositories is not necessarily in the best interest of academics (see Koppi & Lavitt, 2003).

A key promise of digital learning objects and its availability across repositories is the opportunity for benefiting from sharing and reusing resources that are expensive and time-consuming to produce. While this sounds like a laudable concept, it has been suggested that not all content developers are likely to be as enthusiastic about making available their learning and teaching content on repositories without appropriate rewards and safeguards against its use and adaptation (Wiley, 2003). Moreover, not all learning objects may be able to be used as is in

different educational settings. This means that there will be a tendency for users to modify and adapt the original version for their use. Naturally this would require the consent of the original owner and developer of the learning resource. Furthermore, once a digital learning resource is modified, there will be issues relating to the ownership of the revised version and how the original work should be acknowledged. Clearly without appropriate digital learning objects rights management conventions, such issues and concerns will hinder progress on the sharing of digital learning objects across learning object repositories.

Reflection

- What opportunities for learning and teaching do you think that digital learning objects offer in your educational context?

Tell us a Story

- Describe a scenario from your educational context outlining how you see digital learning objects might be suitably used to support learning and teaching. Be sure to consider the opportunities they are likely to present, their limitations and constraints against their use.

Points to remember

- A 'learning object' is any item that has the potential to promote learning.
- A 'digital learning object' is any electronic resource that has the potential to promote learning.
- The ideal learning objects are those that are discrete, interoperable and context free so that they can be re-used in a variety of educational settings.
- For ease of use, learning objects are identified, organized and located with the help of metadata.
- Critical issues in the cataloguing and retrieving of learning objects, include peer review of LOs, intellectual property rights, and their use in tenure and promotion for the creator.

ONLINE LEARNING COURSE DEVELOPMENT MODELS

Goals

The goals of this chapter are to:

1. Review the growth and development of online-learning environments.
2. Explore models of course development for online-learning environments.

Contemporary online learning practices

Contemporary online learning environments are characterized by a growing use of commercially produced learning management systems, which enable online access to subject matter content, asynchronous online discussions, collaborative learning activities, and online assessment. Organizations which seek to adopt online education are quickly realizing that it is not a cheap or easy option (see Simpson, 2005). Online education requires a great deal of resources and careful planning. Some of the strategies used as part of this level of planning include breaking large numbers of students into smaller groups, assigning them specific tasks, and providing them with direction and specific guidance, and setting timelines for discussion. Educators are becoming aware that open, unguided asynchronous online discussion forums can be very ineffective. Students will not give open-ended discussions their time and attention if they are not directed at specific learning or assessment activities.

Most online learning management systems support collaborative learning and small group work, which are widely recognized as desirable educational practices. They enable students to be easily grouped to work on a range of learning activities either online or offline. More importantly, LMSs enable small group work deliberations and activities to be accessible to teachers and tutors to see, critique and comment on. In conventional educational settings, these important aspects of learning would have been accessible only to the group members. Having access to these

deliberations gives teachers added insights into group processes and the contributions of individual members to group work. This insight is critical in promoting fairer assessment practices of group work. Naturally, this kind of educational practice makes student work more visible and open to scrutiny just as the online learning and teaching environment breaks down the barriers to the lecture room walls and makes the teacher and the teaching more visible and open to critique.

Some of the operational and administrative issues that are central to developing and implementing a successful online-learning program include:

- Adopting cost-effective on-line learning management systems that are scalable, and hopefully customizable in order to cope with large numbers of students, and serve the needs of particular contexts and a wide variety of approaches to teaching and learning.

- Adopting learning and teaching designs that maximize the input of the teachers and tutors, and do not leave students floundering in an open and flexible learning space.

- Closely aligning learning and assessment activities in order to ensure that students are more actively engaged in their learning and taking responsibility for their own learning.

- Breaking down the distinctions between "teacher" and "taught" as computer-based conferencing enables students to take on a tutorial role as they learn how to learn from each other.

Reflection

- Is online-learning here yet? Give reasons for your response.

Tell us a Story

- Can you think of a situation where everything in a course is online, as opposed to being partially online?

Models of course development

Online-learning environments with their dependence on technology are very different, in several important ways from conventional educational settings. In conventional educational settings much of the responsibility for teaching and learning is in the hands of the teacher who is also the subject matter expert. In online-learning environments, the teacher who may also be the subject matter expert is no longer in complete control of all the activities. The technology for instance is usually managed and serviced by someone else. Someone else may also manage the content that is delivered by the technology, even though the teacher in charge may have developed it.

Many of the online-learning environments are the result of a team effort, which brings together a wide range of expertise including subject matter experts, learning management system and web developers, graphic artists, and systems engineers to produce a course. This team approach to course development has been widely used especially by distance education institutions. Nevertheless, there are less collaborative approaches as well, in which a single subject matter expert might be able to do everything, or do it with minimal and occasional help.

The choice of a particular approach to the development of an online-learning course is based on several factors including the academic tradition and resources available to the organization. Institutions that are dedicated to online and distance education have tended to adopt a more collaborative course team approach. Conventional campus-based educational providers, on the other hand have tended to adopt a lesser collaborative approach. In any event, the development of an online-learning course comprises a new experience for many. It calls for new skills such as in e-moderation and some de-skilling as well (i.e., shedding off of old lecturing habits). Old habits die hard, and when faced with circumstances that render some of one's previous experience "irrelevant" there is quite a lot of uneasiness, loss of confidence, disillusionment, hostility, and at times withdrawal from the activity altogether.

Types of online-learning courses

Robin Mason (1998) of the United Kingdom Open University has suggested that most online-learning courses sit on a continuum of a "partially online" or a "fully online-learning course" (see http://www.aln.org/publications/ magazine/v2n2/mason.asp).

A "partially online" course is one that integrates existing resource materials that are available either in print or non-print form such as textbooks etc. with some elements of online learning. This might include the use of a learning management system or simply a mailing list for some asynchronous discussion (for example see Naidu, & Oliver, 1999). Such courses promote the concept of what is commonly referred to as "blended learning", where more than one mode is used to teach a course. Most distance educators have known such courses as "wrap around courses" because much of the teaching and learning activities in such courses are wrapped around existing resource materials such as textbooks.

A "fully online" course, on the other hand, is one that will have most of its learning and teaching activities carried out online. I say "most of its learning and teaching activities" because invariably everything about a course could not possibly be carried out online. Moreover, it might not be advisable to do so. For instance, students would always be studying away from the computer from printed materials, textbooks and other resources from libraries. There would be no real need to put these online, and it might not be possible to do so for reasons that have to do with costs and copyright laws. Mason calls this "integrated courses" (see http://www.aln.org/publications/magazine/v2n2/mason. asp).

Wrap around model

This model of online-learning relies on study materials, which may comprise online study guides, activities and discussion "wrapped" around existing previously published resources such as textbooks or CD-ROMs etc. This model represents a resource-based approach to learning, as it seeks to use existing material that is relatively unchanging and is already available online of offline. Such courses, once they are developed, can be taught or tutored by persons other than the course developers. Collaborative learning activities in the form of group work, discussion among peers, and online assessments may be supported by computer conferencing, or mailing lists (see Naidu & Oliver, 1996; 1999). Unfortunately, quite often, these online learning elements tend to be added to the course and do not form an integral part of the assessment requirements of the course.

The integrated model

This model is closest to a full online-learning course. Such courses are often offered via a comprehensive learning management system. They comprise availability of much of the subject matter in electronic format, opportunities for computer conferencing, small group-based collaborative online learning activities, and online assessment of learning outcomes. For the moment though, some of the subject matter content will be best-accessed offline in already published textbooks and other sources. The learning and teaching in these courses takes place in the computer conferences, in which the prescribed readings and the assigned tasks are discussed. Much of this learning and teaching activity is fairly fluid and dynamic as it is largely determined by individual and group activities in the course. To some extent, this integrated model dissolves the distinctions between "teaching" and "learning" in favor of the facilitation of learning (see Bielaczyc & Collins, 1999).

Reflection

- What should an "online learning course" look like? Give your reasons.

Points to remember

- Online course development activity is a team effort which brings together a wide range of expertise.
- These include subject matter experts, instructional designers, learning management systems administrators, web developers, graphics artists, multimedia programmers, audio and video producers, and systems engineers.
- Online courses range from those that are 'partially online' to 'fully online'.

MANAGEMENT AND IMPLEMENTATION OF E-LEARNING

Chapter 7

Goals

The goals of this chapter are to:

1. Explore the preconditions for e-learning activities.
2. Examine the administrative requirements of e-learning activities.
3. Examine the implementation requirements of e-learning activities.

Preconditions of e-learning

E-learning, like any organized educational activity is a very complex undertaking. Many organizations seeking to engage in e-learning activities quite often overlook the fact that its successful deployment requires the same level of diligence and rigor in its planning, management and implementation that is necessary in setting up conventional education systems. In fact, e-learning has added elements such as the technology infrastructure that require attention far beyond that is necessary in conventional educational settings.

Furthermore, e-learning is neither a cheap nor an easy educational option. It does not offer a quick fix for problems associated with dwindling enrollments, distance education, or poor teaching and learning. Lack of careful planning and implementation of e-learning can actually lead to decreasing standards and morale, poor performance in learning and teaching, and wasted resources and loss of revenue.

Any efforts to embark on e-learning must be preceded by very careful planning. This would necessarily comprise, strategic and operational planning that are consistent with the values, mission and goals of an organization. Educational organizations that have a history of employing alternative approaches to learning and teaching such as distance education will have many of the prerequisites and dispositions for e-learning already in place which

they can easily capitalize and build upon. However, conventional campus-based educational organizations that have traditionally relied on residential face-to-face classroom-based learning and teaching activity would need to reconsider their values, mission and goals of educational provision in order to adequately accommodate the adoption of e-learning activities.

A critical component of this orienting or reorienting for the successful adoption of e-learning is institutional sponsorship. For e-learning to succeed in any setting, there has to be complete support for the initiative from the highest levels. This is important not only because it will have implications for funding allocation for any such new initiative, but also because of its implications for the mindset of the rest of the organization. Staff needs to buy into the initiative and be committed to its success (Hawkridge, 1979). Without this kind of a ground swell of support and commitment from its foot solders, any such new initiative is doomed for failure in any organization. These are the preconditions for the successful deployment of e-learning, and they have to be in place as part of the preparation for its deployment in any organization. Without adequate attention to these preconditions, e-learning is unlikely to achieve its full potential in any organization, no matter how robust and reliable is its technology and the infrastructure to support it.

Administrative requirements of e-learning

Like any organized educational activity, e-learning needs to be very systemically (ie., from a systems level) managed. Foremost this will include attention to the technology and the infrastructure that is necessary to support it. It will include different approaches to course design and development and strategies for generating and managing subject matter content from that which is suitable in conventional educational settings (see also Naidu, 1994; 2003).

The technology. While this is crucial to the success of any e-learning activity, technology is not the driver of the initiative. It is there to serve an educational function and such, it is a tool for learning and teaching. However, it has to be robust, reliable and affordable. It is critical to ensure that this is so, just as it is important to ensure that in a classroom-based educational setting, the classroom is available and it is comfortable, and it has the necessary equipment such as tables and chairs and other tools

for teaching and learning to take place. Most teachers and students in such educational settings would take these facilities for granted and they will be unaware of what goes on behind the scenes to ensure that the classroom setting works in the way in which it is expected to work. Staff and students alike would be very agitated if the computer, the projector, or the lights in the classroom did not work, as that would be very disruptive to their learning and teaching activities. In the same way e-learning technology needs to work just as transparently and fluidly to allow teachers and students to concentrate on learning and teaching and not be distracted by the technology. If teachers and students have to be taught to operate this technology, then there should be processes and programs in place for this training to occur, routinely.

Course design and development. Like any other organized educational activity, e-learning, is a team effort, as a number of people and a range of expertise need to be brought together to make e-learning work. In conventional educational systems, course design and development is the sole responsibility of the subject matter expert who is also the teacher. E-learning will require the delivery of that subject matter content in alternative forms such as online or on a CD-ROM. Some teachers are able to produce their content themselves. However, this might not be the best use of their time and expertise in most educational settings. A more efficient and effective model of course development is the team approach, which brings together people with subject matter knowledge and expertise in the development of technology enhanced learning materials. However, the establishment and nurturing of such a team process is not to be taken lightly as it has implications on where the boundaries lie for various types of expertise and on the costs of supporting it across a large organization (see also Foster, 1992; Holmberg, 1983; Mason & Goodenough, 1981; Riley, 1984; Smith, 1980).

Subject matter content management. In conventional educational settings, the generation and presentation of the subject matter content is the sole responsibility of the teacher. In e-learning, while the teacher may still be generating this content, for it to be made accessible to the learners, it needs to be modified, enhanced and presented in a form that is amenable to the technology that is in use (see Lewis, 1971a; 1971b; 1971c;

Lockwood, 1994; Riley, 1984; Rowntree, 1994). Content once generated will need to be updated in order to retain its currency and relevance. For this to happen, academic staff and other content developers will need expert assistance with learning and instructional design activities. They will need to be supported in the design and development of such self-study materials in alternative media forms. Permissions will be required in the form of copyright clearance to publish some of this material in such form. In large educational settings, this will create a substantial amount of work, which will require enough trained staff and appropriate procedures and processes (see Kember & Mezger, 1990; Jenkins, 1990; Naidu, 1987; 1988).

Implementation requirements of e-learning

In conventional classroom-based educational settings, teachers spend a great deal of their teaching time in subject matter content presentation. This activity usually takes the form of lectures where teachers go through a body of subject matter content. Students on the other hand, spend a great deal of their study time in sitting in lectures taking down lecture notes. Irrespective of whether this is a good or bad educational practice; it is certainly an inefficient and ineffective use of teachers' and students' time. If subject matter content needs to be presented, then there are surely several more efficient and effective ways of presenting it. Sitting students down in a lecture room and having them take down notes, often not so accurately, is certainly not one of those ways. E-learning, with its use of information and communications technology, enables the presentation of subject matter content in alternative forms, as such freeing up lecture time which can now be more usefully devoted to the facilitation and support of learning activity.

However, e-learning in itself does not guarantee efficient or effective learning and teaching. For it to be efficient and effective, a great deal of care and attention needs to go into its implementation. This comprises attention to the recruitment and registration of students, facilitating and supporting learning, assessing learning outcomes, providing feedback to learners, evaluating the impacts of e-learning on the organization, and a host of other issues related to these functions (see also Naidu, 1994; 2003).

Student registration. Most educational and training organizations have rigorous systems and processes in place to manage student registrations and their graduation. Those who choose to adopt on-line learning would want to also ensure that they are able to recruit, registrar and manage their students online in the fashion of e-commerce and e-business. Doing so would be consistent with an ethos and philosophy of making one's registration processes accessible online. This would require administrative systems to be in place and that the staff members are appropriately trained.

Learner support. In the context of e-learning, learner support takes on an added importance, as learners become separated in time and place from the teacher and the educational organization. This does not mean that necessarily more learner support is required. What changes is how learner support is provided, where and when and how often it is provided and who provides it (see Holmberg, 1986). An online learning course, may not be supported and facilitated by those who developed these courses.

Assessment of learning and the provision of feedback. While in e-learning, the fundamental and guiding principles of assessment of learning outcomes and providing feedback on learning remains the same as that for any other educational setting, what changes is how some of the learning outcomes can and might be assessed and also how feedback may be provided. Most educational settings must also deal equitably and fairly with unfair practices such as plagiarism and authenticity of student work. E-learning because of the flexibility it affords in terms of time and space independence are more prone to unfair learning and assessment practices. Opportunities for these occurrences need to be properly managed.

Evaluation of the impacts of e-learning. It is crucial to have processes in place for knowing how you are doing with what you have initiated. This will include how your staff and students are engaging in e-learning. Without this kind of evidence, you are in no position to know how you might be traveling and what changes and/or improvements are necessary. Evaluation of impacts is often neglected or inefficiently carried out in most educational settings. Evaluation of the impacts of your processes should be closely integrated into the planning and implementation of any e-learning activity (see Naidu, 2005).

Reflection

● What are some of the particular challenges in the management and implementation of e-learning activity?

Tell us a Story

● Relate an experience that you or your colleagues have faced, and how you have approached these challenges?

Points to Remember

● E-learning is neither a quick fix nor a cheap option for educational problems.

● Effective implementation of e-learning requires planning at the strategic and operational levels consistent with the mission of the educational organization.

● A positive disposition in the organization towards technology is a must for the successful deployment of e-learning.

● Think about educational function of the technology, before its implementation.

● Putting in place robust, reliable and affordable technology is essential for creating a comfortable teaching and learning environment.

● Consider adoption of team approach in course design and development for e-learning. Subject matter experts need assistance with course design, copyright clearances and host of other issues.

EVALUATING THE IMPACTS OF E-LEARNING

Chapter 8

Goals

The goals of this chapter are to:

- Explore issues related to the evaluation of e-learning and teaching activities.
- Propose a comprehensive plan for the evaluation of e-learning and teaching.

Goals of evaluation

A major goal of any evaluation activity is to influence decision-making. For any organization to be able to attain its mission, a comprehensive evaluation strategy for ascertaining the impacts of its various teaching, learning and research related activities is crucial. This strategy needs to be systemic and systematic in its approach to gathering different types of data and feedback from a range of sources, and with the help of a variety of instruments. The gathering of this kind of data and feedback is also crucial to ensuring a high quality of service, and effective utilization of information and communications technology in teaching and learning.

The term "evaluation" is being used here to refer to the systematic acquisition of feedback on the use, worth and impact of some activity, program or process in relation to its intended outcomes (see Naidu, 2005). The most basic distinctions between various types of educational evaluation activities are drawn between formative, summative, and monitoring or integrative evaluation (see also Kirkpatrick, 1994; Naidu, 2002, 2005; Reeves, 1997, 1999).

Evaluation methodology

You should aim to gather data from all stakeholders (i.e., students and staff) regularly using a set of evaluation instruments within a consistent evaluation framework which should include front-end analysis, formative, summative and integrative evaluation. You

should also aim to collect a variety of data using a range of data gathering instruments. However, you would want to keep the data gathering process as simple and as less intrusive as possible.

Front-end analysis comprises a set of ways by which you would plan to ascertain the readiness of students and staff and their preferences in relation to teaching and learning online. Carrying out such surveys periodically and especially prior to the full roll-out of e-learning will enable your organization to get a better handle on how to align its services to meet the needs of prospective users. The information gathered will help to inform the organization on the nature of its user needs, their perceptions and expectations, and any gaps in the provision of existing support.

Formative evaluation would involve gathering feedback from users and other relevant groups during the implementation process. Its purpose would be to identify problems so that improvements and adjustments can be made during the implementation stages of e-learning in your organization. You may wish to plan to carry out formative evaluations routinely and regularly. It would be best that these evaluations use a consistent set of tools comprising surveys, and focus group interviews with users.

Summative evaluation will enable you to ascertain the full impacts and outcomes of e-learning on teaching and learning at your organization. You would usually carry this out upon the completion of an e-learning program, even though there is not likely to be a crisp dividing line between formative and summative evaluation phases. As part of this process, your aim is to periodically assess the sum impacts of e-learning on teaching and learning activities in your organization. Data gathered should reveal how e-learning is responding to challenges facing teaching and learning in your organization, and the extent to which you are achieving benchmarks and milestones which you have set.

Monitoring or integrative evaluation will comprise attempts to ascertain the extent to which the use of e-learning or online learning is integrated into regular teaching and learning activities at your organization. Data gathered as part of this process will reveal the extent to which, and how teaching and learning activities in the organization have been impacted with e-learning.

For more information on evaluation tools have a look at these sites.

- http://ncode.uow.edu.au/evaltool.html
- http://www.tltgroup.org
- http://www.tltgroup.org/programs/ftools.html
- http://www.tltgroup.org/programs/flashlight.html
- http://mime1.marc.gatech.edu/MM_Tools/ evaluation.html
- http://ncode.uow.edu.au/evaluation.html
- http://ncode.uow.edu.au/evalart.html
- http://ncode.uow.edu.au/evalcase.html
- http://ncode.uow.edu.au/evalstrat.html
- http://www.uwex.edu/disted/evaluation.html
- http://ncode.uow.edu.au/evalother.html
- http://eval.cgu.edu/
- http://ericae.net/nintbod.htm
- http://www.unc.edu/cit/guides/irg-49.html
- http://www.unc.edu/~elliott/evaluate.html
- http://www.icbl.hw.ac.uk/ltdi/cookbook/cookbook.pdf

Reflection

- What are some of the particular challenges in the evaluation of e-learning?

Tell us a Story

- Think of any that you or your colleagues have faced, and how you have approached these challenges?

Points to Remember

- Evaluation refers to the systematic acquisition of feedback on the use, worth and impact of some activity, program or process in relation to its intended outcomes.
- Any evaluation strategy should include front-end analysis, formative, summative and integrative evaluation activities.
- Evaluation of e-learning is no different and should aim at gathering data from all stakeholders.

Acknowledgement

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What do we mean when we say...?

See also :
http://www.learningcircuits.org/ glossary

Action learning
This is learning that is derived from doing, and reflecting in and on that activity.

Approaches to learning
Refers to how one goes about the process of engaging in a learning task or activity, such as in a serial or linear versus a holistic manner.

Appropriate learning technologies
These are technologies that have been carefully selected in light of the nature of the subject matter and skill that is being taught, the learning context, the nature of the learners, and the relative costs of comparable technologies.

Assessment
This is the measurement of students' achievement of learning outcomes.

Assessment tasks
These are activities that learners complete in order to demonstrate their knowledge and competencies.

Assessment tools
These are instruments such as examinations, quizzes and IQ tests, which are designed to assess particular student competencies.

Asynchronous communication
This refers to all forms of verbal and non-verbal exchanges between and among participants in contiguous and non-contiguous settings, who are separated temporally from one another.

Authentic assessment
This refers to assessment that closely reflects reality and situations that the learner is most likely to encounter in professional practice.

Authentic learning environments
These are learning and teaching arrangements that reflect reality and situations that the learner is most likely to encounter in professional practice.

Authentic learning tasks
These are educational activities that closely mirror activities that learners are likely to encounter in real-life.

Automated feedback
This refers to feedback that is provided to all learners in some standard format. This kind of feedback is normally prepared in advance and stored such that the learner is able to receive it almost immediately.

Cognition
This refers to the capability of the learner to understand and derive meaning from any stimulus such as reading, viewing, observing, or doing something.

Cognitive apprenticeship
This refers to a model of training and education in which learning and understanding is derived from being immersed in relevant cognitive tasks.

Cognitive flexibility theory
Largely the work of Rand Spiro, Paul Feltovich, and Richard Coulson, cognitive flexibility theory is an attempt by these authors to reflect the interconnectedness of subject matter especially that in ill-structured domains, and its implications for learning and teaching.

Cognitive skills
These refer to our mental capabilities and our abilities to perform tasks that draw upon memory and thought.

Cognitive skills development
This refers to the empowerment of our mental capabilities, our memory, and our ability for rational thought.

Collaboration
This refers to the act of working or doing something together, towards the accomplishment of common or divergent goals.

Collaborative inquiry
This refers to group-based efforts in the pursuit of information or new knowledge.

Collaborative learning
This refers to group-based learning activities that are usually focused on the accomplishment of common learning goals.

Computer-supported collaborative learning
This refers to all collaborative learning activities that are supported and managed via computers.

Collaborative learning tools
These are learning aides, instruments, and strategies that are designed to optimize engagement in group-based learning activities.

Communication
This refers to the act of passing information from one source to another.

Computer mediated communication
This refers to all electronically supported communication between individuals or among groups.

Computer conference
This is an electronic environment that is able to simultaneously host a number of large and small group activities and discussions.

E-mailing lists
Commonly known as "mailing lists", these are text-based electronic communication channels that support group-based discussion.

Communities of practice
These refer to groups of people who are identifiable by their common interests, profession, or work.

Computer-based assessment
This refers to the assessment of learning achievement that is managed via a computer.

Computer-based learning
This refers to learning activities that are managed via a computer.

Computer-mediated learning
This refers to all learning activity that is delivered and supported via a computer.

Constructivist learning activities
These are activities that situate learning in authentic learning tasks,

and which enable learners to derive understanding by being immersed in these tasks.

Courseware
This refers to all "wares", i.e., educational resources that are directed at or associated with learning and teaching in a subject or course.

Courseware design and development
This refers to the planning and production of all educational resources that are directed at or associated with learning and teaching in a subject or course.

Distance learning
This refers to all organized learning activities under the influence of an educational organization that are carried out by learners who are separated in time and space from their educational organization.

Distributed learning
This refers to all organized learning activities under the influence of an educational organization that are carried out by learners in a number of educational locations, and who may be separated in time and space from their educational organization.

Distributed problem-based learning
This refers to problem-based learning activities carried out by learners in educational settings where they are separated in time and space from their educational organization.

Educational design
This refers to the planning of all educational activities that are associated with the pursuit of particular intended educational outcomes.

Educational objectives
These are statement of outcomes of planned educational projects or programs.

Educational systems design
This refers to the planning of educational projects and programs that are associated with the pursuit of particular educational outcomes.

E-learning
This refers to all organized learning activities under the influence of an educational organization that are carried out with the help of information and communications technologies.

Evaluation
This refers to the systematic acquisition of information and feedback on the use, worth and impact of some object, program or process in relation to its intended outcomes.

Experiential learning
This refers to all organized learning activities that are grounded in the experience of learners or the organization.

Feedback
This refers to information that is gathered or received on the impacts of some object, program, or process.

Flexible learning
This refers to learning arrangements that allow learners access to learning opportunities and resources at a time, place and pace that is convenient to them.

Formative assessment
This refers to the measurement of learning achievement during the educational process in order to monitor the progress of students through the process.

Formative evaluation
This refers to the measurement, during

the implementation process, of the use, worth and impacts of some object, program, or process in relation to its intended outcomes in order to monitor its progress.

Information and communications technology (ICT)
These refer to computer and telephonic technologies, usually working in an integrated mode.

Information commons
These are learning arrangements in educational settings where space and resources are made available to learners in a flexible and user-friendly manner.

Information design
This refers to the arrangement and presentation of information in a user-friendly and pleasant manner.

Information literacy
This refers to one's awareness of relevant information and resources, their ability to know where to locate it, and know how to use it efficiently and effectively.

Instructional design
This refers to the planning of learning and teaching activities that are associated with the pursuit of particular intended learning outcomes.

Instructional systems design
This refers to a widely recognized and iterative process, which incorporates the analysis, design, development, and evaluation of any educational or training activity.

Interactivity
This refers to all forms of transactions between and among learners, as well as the learners and the learning resources.

Interactive multimedia
This refers to computer-based software that suitably integrates audio-video, text, and animation to engage and motivate its users.

Learning
This refers to the acts of deriving meaning from some object or process, following which there is a demonstrable change in the learner's cognition and behavior.

Learning by designing
This refers to the utilization of the act of designing some object or process as an anchor for situating and engendering learning.

Learning communities
These are groups that develop because of shared concerns and interests, and which thrive on the pursuit of these shared goals.

Learning Content Management System (LCMS)
This is an electronic environment that serves as a content repository, which stores, manages, and maintains the learning content. The purpose of a LCMS is to manage the students' learning content and often times the development of that content. The LCMS separates the content from its delivery and look, and feel.

Learning designs
These are plans and models for approaching the acts of learning in uniquely different ways.

Learning journal
This is a record of one's learning. It reflects significant changes in the views and perceptions of the journal keeper about the subject matter and the learning experience.

Learning Management System (LMS)

These are software applications that comprise an integrated suite of tools to enable online learning interventions.

Learning object

Broadly defined, this refers to any discrete resource (such as a book, subject or a course) that can be put to educational use. A digital learning object is an electronic resource with educational potential that can be stored, catalogued, searched, and reused.

Learning Resource Catalogue (LRC)

This is a database of learning resources catalogued according to meta-tags.

Learning portfolios

These are files or folders, which contain students' work, including evidence of their learning.

Multimedia

This refers to computer-based software that suitably integrates audio-video, text, and animation into a single product.

Multimedia design and development

This refers to the planning and production of computer-based software that suitably integrates audio-video, text, and animation into a single product.

Online assessment

This refers to measurement of learning achievement that is conducted in an electronic networked environment, such as an intranet or the Internet.

Online collaboration

This refers to collaborative activities that are carried out over an electronic networked environment, such as an intranet or the Internet.

Online learning

This refers to all learning activities that are carried out over an electronic networked environment, such as an intranet or the Internet.

Online pedagogy

This refers to unique approaches to learning and teaching that are particularly suitable for an electronic networked learning environment, such as an intranet or the Internet.

Online socialization

This refers to all forms of communication in an electronic networked environment, such as an intranet or the Internet that leads to cohesion and community building in a group.

Open learning

This refers to all organized learning activities under the influence of an educational organization that are accessible to learners in many ways such as the time, pace and place of study.

Pedagogy

This is the science of teaching.

Peer feedback

This refers to all forms of responses and reactions, on a group member's work, from fellow members of the group.

Problem solving

This is the process of identifying the causes of a problem and seeking for solutions to that problem.

Problem-based learning

This refers to an approach to learning in which a problem situation serves as the focus and anchor of all learning activities.

Professional practice

This refers to one's engagement in all activities that are consistent and congruent with a particular profession.

Project-based learning

This refers to an approach to learning in which a project serves as the focus and anchor of all learning activities.

Role-play

This refers to the enactment of particular roles, usually in a contrived situation, for the purposes of learning and teaching, and entertainment.

Scaffolding learning

This refers to supporting students in their learning, and gradually withdrawing that support as they become more adept and proficient at learning.

Self-assessment

This refers to attempts at ascertaining learning achievement by oneself, usually with the help of automated marking schemes and feedback.

Simulation & modeling

This refers to the articulation of real-life scenarios, processes, and objects with artificial forms, representations and models of the same.

Situated learning

This refers to learning wherein the situation serves as the focus and anchor of all learning activities.

Social presence

This refers to evidence of being and existence in communal or group-based settings. In the context of electronic conferencing environments, for instance, social presence refers to the visibility of participants with the use of emoticons and other textual means.

Socialization

This refers to the process of community building among groups.

Student support

This refers to all forms of assistance that is provided to students to support their learning.

Student-centered learning

This refers to all educational activities, which considers the students, their needs, and circumstances at the center of the process.

Summative assessment

This refers to the measurement of learning achievement at the end of the educational process as an indicator of students' final achievement in the course or program.

Summative evaluation

This refers to the measurement, at the end of the implementation process, of the use, worth and impacts of some object, program, or process in relation to its intended outcomes, in order to ascertain its total impacts.

Synchronous communication

This refers to all forms of simultaneous verbal and non-verbal exchanges between and among participants in both contiguous and non-contiguous settings.

Technology enhanced learning

This refers to all learning activities that are in some way empowered by the use of any form of electronic media such as audio-video and various combinations of information and communications technology.

Tele-mentors

These are academic advisors, and other student support staff who are temporally and spatially separated from those they advise.

Virtual learning

This refers to all learning activities that occur in non-contiguous educational settings where the learners and their

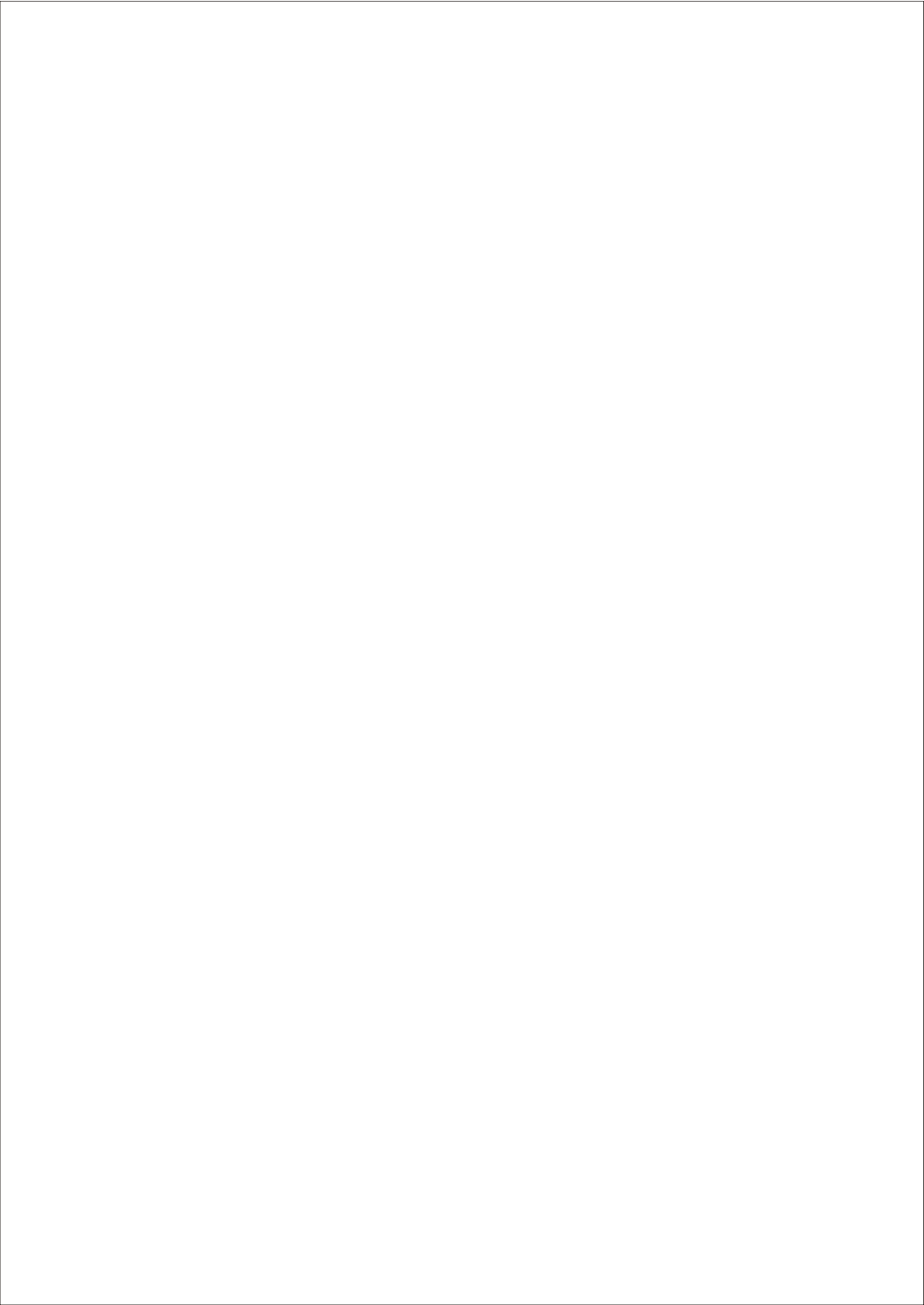teachers are separated temporally and spatially.

Virtual worlds
These are artificial environments that are designed to reflect real-life situations.

Web-based learning
This refers to all learning activities that are managed on the World Wide Web.

Web-based role-play simulation.
This refers to role-play activities that are carried out on the World Wide Web.

The Commonwealth of Learning (COL), Vancouver, Canada established The Commonwealth Educational Media Centre for ' Asia (CEMCA), New Delhi in 1994. The Commonwealth of Learning (COL) is an intergovernmental organisation created by Commonwealth Heads of Government to encourage the development and sharing of open learning/distance education knowledge, resources and technologies. COL works with Commonwealth nations to improve access to quality education and training.

COL Mission
Recognising KNOWLEDGE as key to cultural, social and economic development, The Commonwealth of Learning is committed to assisting Commonwealth member governments to take full advantage of open, distance and technology-mediated learning strategies to provide increased and equitable access to education and training for all their citizens.

CEMCA Mission
In consonance with the mission of the Commonwealth of Learning, the Commonwealth Educational Media Centre for Asia promotes the meaningful, relevant, and appropriate use of information and communication technologies to serve the educational and training needs of Commonwealth member states of Asia.

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