

CHAPTER 1

Introduction

INTRODUCTION

Advances in information technology, coupled with changes in society, have had a tremendous impact on our educational and training systems. Participants in this educational and training paradigm require rich learning environments supported by well-designed resources. They expect on-demand, anytime/anywhere high-quality learning environments with good support services. In other words, they want increased *flexibility* in learning—they want to have more say in what they learn, when they learn, and where and how they learn. They may choose a mix of traditional and new learning approaches and technology; they may want to study at their chosen time and location and at their own pace (Khan, 2007). Therefore, there is a tremendous demand for *affordable, efficient, easily accessible, open, flexible, well-designed, learner-centered, distributed and facilitated learning environments*.

Can we do what learners want? Nunan (1996) stated, “Teaching and learning may be created through exploring different ways of delivering education. When 'delivery' or 'learning' is coupled with the word flexible, the intention to increase for learners both their access to, and their control over, particular teaching and learning environments is implied.” New developments in learning science and technology provide opportunities to develop learning environments that suit students' needs and interests by offering them the choice of increased flexibility. A mix of traditional and new learning approaches and technologies is instrumental in creating innovative learning environments with increased flexibility.

With the advent of the Internet and online learning methodologies and technologies, providers of education (K12 and higher education) and training are creating e-learning materials to fulfill the demand. Online learning is becoming more and more accepted in workplace. Institutions are investing heavily in the development and deployment of online programs. Academic institutions, corporations, and government agencies worldwide are increasingly using the Internet and digital technologies to deliver instruction and training. At all levels of these institutions, individuals are being encouraged to participate in online learning activities. Many instructors and trainers are being asked by their institutions to convert their traditional face-to-face (f2f) courses to e-learning. Individuals involved in designing e-learning or converting f2f courses to online environments are faced with many challenges: *What is e-learning and how is it different from f2f*

learning? What does and does not work for e-learning? How does one measure e-learning success? etc.

In this chapter, e-learning is discussed from the perspectives of open, flexible and distributed learning environment; and how its various learning features can be designed to address critical issues of e-learning environment. The following is an outline for the chapter:

- What is E-Learning?
- Open and Distributed Learning Environment
- Traditional Instruction and E-Learning
- Learner-Focused E-Learning System
- Components and Features of E-Learning
- A Framework for E-Learning
- Review of E-Learning Features with the Framework

WHAT IS E-LEARNING?

With the Internet's and digital technologies' rapid growth, the Web has become a powerful, global, interactive, dynamic, economic and democratic medium of learning and teaching at a distance (Khan, 1997a). The Internet provides an opportunity to develop learning-on-demand and learner-centered instruction and training. There are numerous names for online learning activities, including E-Learning, Web-Based Learning (WBL), Web-Based Instruction (WBI), Web-Based Training (WBT), Internet-Based Training (IBT), Distributed Learning (DL), Advanced Distributed Learning (ADL), Distance Learning, Online Learning (OL), Mobile Learning (or m-Learning) or Nomadic Learning, Remote Learning, Off-site Learning, a-Learning (anytime, anyplace, anywhere learning), etc. In this book, the term **e-learning** is used to represent open, flexible and distributed learning.

Designing and delivering instruction and training on the Internet requires thoughtful analysis and investigation, combined with an understanding of both the Internet's capabilities and resources and the ways in which instructional design principles can be applied to tap the Internet potential (Ritchie & Hoffman, 1997, cited in Khan, 1997b). Designing e-learning for open, flexible and distributed learning environments is new to many of us. After reflecting on the factors that must be weighed in creating effective open, distributed and flexible learning environments for learners worldwide, the following definition of e-learning is formulated in this book.

E-Learning can be viewed as an innovative approach for delivering well-designed, learner-centered, interactive, and facilitated learning environment to anyone, anyplace, anytime by utilizing the attributes and resources of various digital technologies along with other forms of learning materials suited for open, flexible and distributed learning environment.

The above definition of e-learning raises the question of how various attributes of e-learning methods and technologies can be utilized to create learning features appropriate for diverse learners in an open, flexible and distributed environment.

Open and Distributed Learning Environment

What is an open and distributed learning environment? According to Calder & McCollum (1998), "The common definition of open learning is learning in your own time, pace and place" (p. 13). Ellington (1997) notes that open and flexible learning allows learners to have some say in how, where, and when learning takes place. Saltzberg & Polyson (1995) noted that distributed learning is not synonymous with distance learning, but, they stress its close relationship with the idea of distributed resources:

Distributed learning is an instructional model that allows instructor, students, and content to be located in different, non-centralized locations so that instruction and learning occur independent of time and place. . . . The distributed learning model can be used in combination with traditional classroom-based courses, with traditional distance learning courses, or it can be used to create wholly virtual classrooms. (p. 10)

Janis Taylor of Clarke College in Iowa who teaches students coming from different places in the Midwest commented on open, distributed and flexible learning:

Consider a student user who described her online education as open because she can sit out on her back deck supervising her children in the swimming pool while doing her homework. Now that's open-air and *open* learning. One of my pre-service teachers works in a chemical lab in Cleveland, another is a court reporter three hours drive from me and another is a nurse in rural western Iowa. I, their teacher, am sitting in a small liberal arts college in eastern Iowa, a state badly needing to tap new people to come into the teaching profession. How could I get them all here to my campus if e-learning weren't *distributed*? This open and distributed learning environment made learning flexible for a young traveling business woman who says "I take my college course, my instructor, and all of my fellow students with me on every business trip. With my laptop in my hotel room, I can view my teacher's demonstration, discuss it with my classmates in the Chat Room, and turn in my assignment by e-mail." Now that's a *flexible* college program (J. Taylor, personal communication, June 22, 2004).

Flexibility in learning is, therefore, dependent on the openness of the system and the availability of learning resources distributed in various locations. A clear understanding of the *open and distributed* nature of learning environments will help us create meaningful learning environments with increased flexibility. Figure 1 graphically shows how an open and distributed educational system contributes to flexibility.

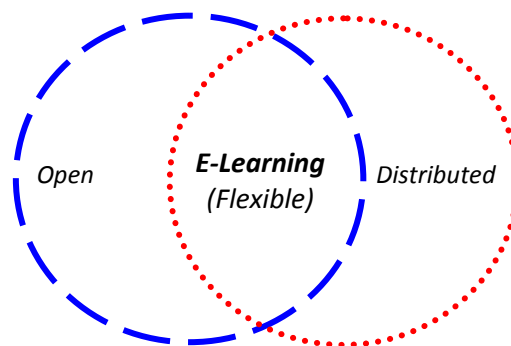


Figure 1: Open and Distributed Learning

Traditional Instruction and E-Learning

The design and format of open, flexible and distributed e-learning can be different from traditional classroom instruction. Traditional classrooms are space bound. Traditional instruction treats learning pretty much as a *closed system*, taking place within the confines of a given classroom, school, textbook, field trip, etc. (Greg Kearsley, personal communication, January 27, 2000). Classroom-taught courses are not necessarily closed systems; many teachers assign students to do library based research papers, interview members of a professional community, engage in service-learning activities, and extend their learning initiatives far beyond the classroom itself. Unfortunately many classes are bound by their four walls involving only the thoughts of the instructor, the textbook writer and occasional student comments. Classroom courses are also closed in the sense that they are limited to only those students who can physically come to the location (Janis Taylor, personal communication, May 24, 2004)

On the other hand, e-learning extends the boundaries of learning, so that learning can occur in the classrooms, from home and in the work place (Relan & Gillani, 1997). It is a flexible form of education because it creates options for learners in terms of where and when they can learn (Krauth, 1998). A well-designed e-learning course allows learners to become actively involved in their learning processes. However, a poorly designed e-learning course can be just as rigid and dogmatic and non-interactive as a poorly taught face to face course. The scope of openness and flexibility in e-learning is dependent on how it is designed. "While having an open system has its appeal, it can make designing for it extremely difficult, because in an open system, the designer agrees to give up a certain amount of control to the user" (Jones & Farquhar, 1997, p. 240). The more open the learning environment, the more complex the planning, management, and evaluation of it (Land & Hannafin, 1996). For example, the instructor cannot monitor who helps the student on tests unless proctored.

Learner-Focused E-Learning System

A leading theorist of educational systems, B.H. Banathy (1991), makes a strong case for learning-focused educational and training systems where "the learner is the key entity and occupies the nucleus of the systems complex of education" (p. 96). For Banathy, "*when learning is in focus*, arrangements are made in the environment of the learner that communicate the learning task, and learning resources are made available to learners so that they can explore and master learning tasks" (p. 101). A distributed learning environment that can effectively support learning-on-demand must be designed by placing the learners at the center. In support of learner-centered approach, Moore (1998) states:

Our aim as faculty should be to focus our attention on making courses and other learning experiences that will best empower our students to learn, to learn fully, effectively,

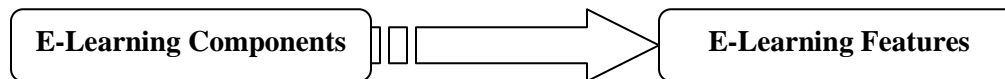
efficiently, and with rewarding satisfaction. It is the responsibility of our profession to study ways of maximizing the potential of our environments to support their learning and to minimize those elements in their environments that may impede it. (p. 4).

Success in an e-learning system involves a systematic process of planning, designing, evaluating, and implementing online learning environments where learning is actively fostered and supported. An e-learning system should not only be meaningful to learners, but it should also be meaningful to all stakeholder groups including instructors, support services staff, and the institution. For example, an e-learning system is more likely to be meaningful to *learners* when it is easily accessible, clearly organized, well written, authoritatively presented, learner-centered, affordable, efficient, flexible, and has a facilitated learning environment. When learners display a high level of participation and success in meeting a course's goals and objectives, this can make e-learning meaningful to *instructors*. In turn, when learners enjoy all available support services provided in the course without any interruptions, it makes *support services staff* happy as they strive to provide easy-to-use, reliable services. Finally, an e-learning system is meaningful to *institutions* when it has a sound return-on-investment (ROI), a moderate to high level of learners' satisfaction with both the quality of instruction and all support services, and a low drop-out rate (Morrison & Khan, 2003).

In the next section, various attributes of the Internet and other digital technologies are discussed in terms of how they can be used to create meaningful learning environments.

COMPONENTS AND FEATURES OF E-LEARNING

An e-learning program is discussed here in terms of various components and features that can be conducive to learning. *Components* are integral parts of an e-learning system. *Features* are characteristics of an e-learning program contributed by those components. Components, individually and jointly, can contribute to one or more features (Khan, 2001c). For example, *e-mail* is an asynchronous communication tool (component) which can be used by both students and instructors to interact on learning activities. Therefore, with appropriate instructional design strategies, e-mail can be integrated in an e-learning program to create an *interactive* feature between students and the instructors. Think about it this way. While traveling on an airplane, passengers can use Airfone to communicate with others on the ground. In this case, *Airphone*, is a component of the airplane system that allows passengers to establish a *synchronous communication* (feature). Likewise *e-mail*, *mailing lists*, *newsgroups*, *conferencing tools* (components) along with appropriate *instructional design principles and strategies* can contribute to a *collaborative* feature for students working on a group project. The Website <http://BooksToRead.com/wbt/component-feature.ppt> hosts a PowerPoint slide presentation emphasizing the point made above.



E-Learning Components

I have organized e-learning components into seven categories. As the e-learning methodologies and technologies continue to improve, components within the seven categories may need to be modified and new components may be available to be added. Components updates can be found at <http://BooksToRead.com/wbt/component.htm>). Please note that none of these components can

create meaningful e-learning features without the proper integration of *instructional design* which is included in the list below as one of the most important part of e-learning components.

1. Instructional Design (ID)
 - a) Learning and Instructional Theories
 - b) Instructional Strategies and Techniques
2. Multimedia Component
 - a) Text and Graphics
 - b) Audio Streaming (e.g., Real Audio)
 - c) Video Streaming (e.g., QuickTime)
 - d) Links (e.g., Hypertext links, Hypermedia links, 3-D links, imagemaps, etc.)
3. Internet Tools
 - a) Communications Tools
 - i) Asynchronous: E-mail, Listservs, Newsgroups, etc.
 - ii) Synchronous: Text-based (e.g., Chat, IRC, MUDs, messaging, etc.) and audio-video conferencing tools.
 - b) Remote Access Tools (Login in to and transferring files from remote computers.)
 - i) File Transfer Protocol (ftp), etc.
 - c) Internet Navigation Tools (Access to databases and Web documents.)
 - i) Text-based browser, Graphical browser, VRML browser, etc.
 - ii) Plug-ins
 - d) Search Tools
 - i) Search Engines
 - e) Other Tools
 - i) Counter Tool
4. Computers and Storage Devices
 - a) Computer platforms running Graphical User Interface (GUI) based operating systems such as Unix, Windows, Macintosh, Linux and non-GUI based operating systems such as DOS. Mobile devices such as handheld personal digital assistants (PDAs) running Palm operating system, Pocket PC Windows and other platforms.
 - b) Hard drives, CD ROMs, DVDs, etc.
5. Connections and Service Providers
 - a) Modems
 - b) Dial-in (e.g., standard telephone line, ISDN, etc.) and dedicated (e.g., 56kbps, DSL, digital cable modem, T1, E1 lines, etc.) services (<http://whatis.com/dsl.htm>)
 - c) Mobile technology (e.g., connected wireless, wireless LAN, wireless WAN, wireless PAN or personal area network)
 - d) Application Service Providers (ASPs), Hosting Services Providers (HSPs), Gateway Service Providers, Internet Service Providers (ISPs), etc.
6. Authoring/Management Programs, Enterprise Resource Planning (ERP) Software, and Standards
 - a) Scripting Languages (e.g., HTML - Hypertext Markup Language, VRML - Virtual Reality Modeling Language, XML – Extensible Markup Language, RSS - Rich Site Summary, is a text-based format, a type of XML <http://www.faganfinder.com/search/rss.shtml#what>, XSL - Extensible Style Sheet language, XHTML – Extensible Hypertext Markup Language, CSS - Cascading Style Sheets, WML-Wireless Markup language, Java, Java scripting, etc.).

- b) Learning Management System (LMS) and Learning Content Management System (LCMS)
 - c) HTML Converters and Editors, etc.
 - d) Authoring Tools and Systems (easier to use than programming languages)
 - e) Enterprise Application or Enterprise Resource Planning (ERP) Software in which e-learning solutions are integrated. (An article entitled “Integrating your Learning Management System with your Enterprise Resource Planning System” provides valuable information:
http://www.thinq.com/pages/white_papers_pdf/ERP_%20Integration_0901.pdf)
 - f) Interoperability, Accessibility and Reusability Standards (<http://www.adlnet.org/>)
7. Server and Related Applications
- a) HTTP servers, HTTPD software, etc.
 - b) Server Side Scripting Languages – JavaServer Pages (JSP), Active Server Pages (ASP), ColdFusion, Hypertext Preprocessor (PHP), Common Gateway Interface (CGI)—a way of interacting with the http or Web servers. CGI enables such things as image maps and fill-out forms to be run.
 - c) Wireless Application Protocol (WAP) gateway—changes the binary coded request into an HTTP request and sends it to the Web server.

E-Learning Features

A well-designed e-learning program can provide numerous features conducive to learning. However, these features should be meaningfully integrated into an e-learning program to achieve its learning goals. The more components an e-learning program integrates, the more learning features it is able to offer. However, the effectiveness of e-learning features largely depends on how well they are incorporated into the design of the programs. The quality and effectiveness of an e-learning feature can be improved by addressing critical issues within the various dimensions of open, flexible and distributed learning environment (discussed later in Table 1.3). The following are examples of some e-learning features: *Interactivity, authenticity, learner-control, convenience, self containment, ease of use, online support, course security, cost effectiveness, collaborative learning, formal and informal environments, multiple expertise, online evaluation, online search, global accessiblity, cross-cultural interaction, non-discriminatory, etc.* As components of e-learning improve as a result of the advent of the Internet and online learning methods and technologies, existing e-learning features will improve and new features may be available to us. Several features that are contributed by e-learning components are presented in Table 1.1.

Table 1.1: Features and components associated with e-learning environments

E-Learning Features	E-Learning Components	Relationship to Open, Flexible and Distributed Learning Environment
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<i>Ease of Use</i>	A standard point and click navigation system. Common User Interface, Search Engines, Browsers, Hyperlinks, etc.	A well-designed e-learning course with intuitive interfaces can anticipate learners' needs and satisfy the learners' natural curiosity to explore the unknown. This capability can greatly reduce students' frustration levels and facilitate a user-friendly learning environment. However, delays between a learner's mouse click and the response of the system can contribute to the frustration level of users. The hypermedia environment in an e-learning course allows learners to explore and discover resources which best suit their individual needs. While this type of environment facilitates learning, it should be noted that learners may lose focus on a topic due to the wide variety of sources that may be available on an e-learning course. Also, information may not always be accessed because of common problems related to servers such as connection refusal, no DNS entry, etc. (Khan, 2001c).
<i>Interactivity</i>	Internet tools, hyperlinks, browsers, servers, authoring programs, instructional design, etc.	Interactivity in e-learning is one of the most important instructional activities. Engagement theory based on online learning emphasizes that students must be meaningfully engaged in learning activities through interaction with others and worthwhile tasks (Kearsley & Shneiderman, 1999). E-learning students can interact with each other, with instructors, and online resources. Instructors and experts may act as facilitators. They can provide support, feedback and guidance via both synchronous and asynchronous communications. Asynchronous communication (i.e., e-mail, listservs, etc.) allows for time-independent interaction whereas synchronous communication (i.e., conferencing tools) allows for live interaction (Khan, 2001c).
<i>Multiple Expertise</i>	Internet and WWW	E-learning courses can use outside experts to guest lecturers from various fields from all over the world. Experiences and instruction that come directly from the sources and experts represented on the Internet can tremendously benefit learners.
<i>Collaborative Learning</i>	Internet tools, instructional design, etc.	E-learning creates a medium of collaboration, conversation, discussions, exchange, and communication of ideas (Relan & Gillani, 1997). <i>Collaboration</i> allows learners to work and learn together to accomplish a common learning goal. In a collaborative environment, learners develop social, communication, critical thinking, leadership, negotiation, interpersonal and cooperative skills by experiencing multiple perspectives of members of collaborative groups on any problems or issues.
<i>Authenticity</i>	Internet and WWW, instructional design, etc.	The conferencing and collaboration technologies of the Web bring learners into contact with authentic learning and apprenticing situations (Bonk & Reynolds, 1997). E-learning courses can be designed to promote authentic learning environments by addressing real world problems and issues relevant to the learner. The most significant aspect of the Web for education at all levels is that it dissolves the artificial wall between the classroom and the 'real world' (Kearsley, 1996).

Learner-Control	Internet tools, authoring programs, hyperlinks, instructional design, etc.	The filtered environment of the Web allows students the choice to actively participate in discussion or simply observe in the background. E-learning puts students in control so they have a choice of content, time, feedback and a wide range of media for expressing their understandings (Relan & Gillani, 1997). This facilitates student responsibility and initiative by promoting ownership of learning. The learner-control offered by e-learning is beneficial for the inquisitive student, but the risk of becoming lost in the Web and not fulfilling learner expectations can be a problem and will require strong instructional support (Duchastel, 1996).
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In designing e-learning environments using the features described above, we should explore (issues within the various dimensions) of open, flexible and distributed learning environments (OFDLEs). In the next section, I present a framework that discusses issues of OFDLE. Also, later in this chapter, I review an e-learning feature for its effectiveness using issues within the various dimensions of OFDLE (see Table 1.4).

A FRAMEWORK FOR E-LEARNING

The seeds for the E-Learning Framework began germinating with the question, "What does it take to provide flexible learning environments for learners worldwide?" With this question in mind, since 1997 I have been communicating with learners, instructors, trainers, administrators, and technical and other support services staff involved in e-learning in both academic (K12 and higher education) and corporate settings from all over the world. I researched critical e-learning issues discussed in professional discussion forums, and designed and taught online courses. I reviewed literature on e-learning. As the editor of *Web-Based Instruction* (1997), *Web-Based Training* (2001), and *Flexible Learning* (2007), I had the opportunity to work closely on e-learning issues with about two hundred authors from all over the world who contributed chapters in these books.

Through these activities, I have come to understand that e-learning represents a paradigm shift not only for learners, but also for instructors, trainers, administrators, technical and other support services staff, and the institution. We (i.e., students, instructors, and staff) are accustomed to the structure of a traditional educational system where instructor-led, face-to-face classes are the learning environment. E-learning, on the other hand, is an innovative way of providing instruction to diverse learners in an environment where students, instructors, and support staff do not see each other. The format of such a learning environment is different from traditional classroom instruction. As indicated earlier, traditional classroom-based instruction takes place in a closed system (i.e., within the confines of a given classroom, school, textbook, or field trip) whereas e-learning takes place in an open system (i.e., it extends the boundaries of learning to an open and flexible space where learners decide where and when they want to learn). Learners in an open, flexible and distributed learning environment need immediate attention and feedback on their work in order to continue their learning processes. We have to provide the best support systems for them so that they do not feel isolated and join the list of dropouts.

As we are accustomed to teaching or learning in a closed system, the openness of e-learning is new to us. In order to create effective environments for diverse learners, however, we need to jump out of our closed system learning design mentality. We need to change our mindset—that's

the paradigm shift. In order to facilitate such a shift, and in response to the range of issues I saw in my research, I created the E-Learning Framework (Figure 1.2).

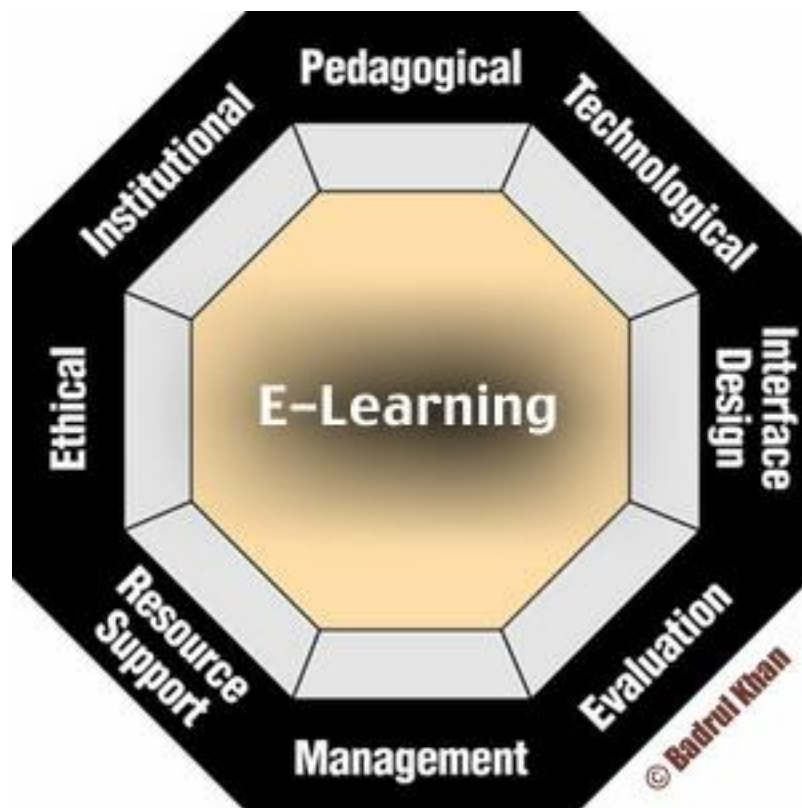


Figure 1.2: The E-Learning Framework

The purpose of this framework is to help you think through every aspect of what you are doing during the steps of the e-learning design process. Therefore, in this book, I am going to take each of the eight dimensions of this framework (for example, Chapter 1 deals with institutional dimension of the framework), and show what questions you should ask about each dimension as you design an e-learning segment either a lesson, a course or an entire program.

I found that numerous factors help to create a meaningful learning environment, and many of these factors are systemically interrelated and interdependent. A systemic understanding of these factors can help designers create meaningful learning environments. I clustered these factors into eight *dimensions*: institutional, management, technological, pedagogical, ethical, interface design, resource support, and evaluation (Table 1.2). Various issues within the eight dimensions of the framework were found to be useful in several studies that were conducted to review e-learning programs, resources and tools (Khan, 2007; Khan & Smith, 2007; Romiszowski, 2004; Singh, 2003; Chin & Kon, 2003; Kuchi, Gardner, & Tipton, 2003; Mello, 2002; Barry, 2002; Goodear, 2001; Khan, Waddill, & McDonald, 2001; Dabbagh, Bannan-Ritland, & Silc, 2001; Khan & Ealy, 2001; El-Tigi & Khan, 2001; Zhang, Khan, Gibbons, & Ni, 2001; Gilbert, 2000; and Kao, Tousignant, & Wiebe, 2000).

Table 1.2: Eight Dimensions of E-Learning Framework

Dimensions of E-Learning	Descriptions
<i>Institutional</i>	The institutional dimension is concerned with issues of administrative affairs, academic affairs and student services related to e-learning.
<i>Management</i>	The management of e-learning refers to the maintenance of learning environment and distribution of information.
<i>Technological</i>	The technological dimension of e-learning examines issues of technology infrastructure in e-learning environments. This includes infrastructure planning, hardware and software.
<i>Pedagogical</i>	The pedagogical dimension of e-learning refers to teaching and learning. This dimension addresses issues concerning content analysis, audience analysis, goal analysis, medium analysis, design approach, organization, and learning strategies.
<i>Ethical</i>	The ethical considerations of e-learning relate to social and political influence, cultural diversity, bias, geographical diversity, learner diversity, digital divide, etiquette, and the legal issues.
<i>Interface design</i>	The interface design refers to the overall look and feel of e-learning programs. Interface design dimension encompasses page and site design, content design, navigation, accessibility and usability testing.
<i>Resource support</i>	The resource support dimension of the e-learning examines the online support and resources required to foster meaningful learning.
<i>Evaluation</i>	The evaluation for e-learning includes both assessment of learners and evaluation of the instruction and learning environment.

Each dimension has several subdimensions (Table 1.3). Each subdimension consists of items or issues focused on a specific aspect of an e-learning environment. Throughout the book, the issues within each subdimension of the E-Learning Framework are presented as *questions* that course designers can ask themselves when planning e-learning. As you know each e-learning project is unique. I encourage you to identify as many issues (in the form of questions) as possible for your own e-learning project by using the framework. One way to identify critical issues is by putting each stakeholder group (such as learner, instructor, support staff, etc.) at the center of the framework and raising issues along the eight dimensions of the e-learning environment. This way you can identify many critical issues and answer questions that can help create a meaningful e-learning environment for your particular group. By repeating the same process for other stakeholder groups, you can generate a comprehensive list of issues for your e-learning project.

For example, *is the course sensitive to students from different time-zones (e.g., are synchronous communications such as chat discussions are scheduled at reasonable times for all time zones represented)?* This is an example of a question that e-learning designers can ask in the *geographical diversity* section of the *ethical* dimension. As we know scheduled chat discussions may not work for learners coming from different time zones. In the US, there are the six time zones. Therefore, e-learning course designers should be sensitive to diversity in geographical time zones (i.e., all courses where students can reasonably be expected to live in different time zones).

The purpose of raising many questions (which are included at the end of each chapter as **e-learning quick checklist items**) within each dimension (see Table 1.3) is to help designers think through their projects thoroughly. Note that there might be other issues not included in the book, or not yet encountered. As more and more institutions offer e-learning worldwide, designers will become more knowledgeable about new issues within the eight dimensions of e-learning.

Table 1.3: Sub-dimensions of the E-Learning Framework

INSTITUTIONAL (Chapter 2) Administrative Affairs Academic Affairs Student Services MANAGEMENT (Chapter 3) People, Process and Product (P3) Continuum Management Team Managing E-Learning Content Development Managing E-Learning Environment TECHNOLOGICAL (Chapter 4) Infrastructure Planning Hardware Software	PEDAGOGICAL (Chapter 5) Content Analysis Audience Analysis Goal Analysis Design Approach Instructional Strategies Organization Blending Strategies ETHICAL (Chapter 6) Social and Cultural Diversity Bias and Political Issues Geographical Diversity Learner Diversity Digital Divide Etiquette Legal Issues	INTERFACE DESIGN (Chapter 7) Page and Site Design Content Design Navigation Accessibility Usability Testing RESOURCE SUPPORT (Chapter 8) Online Support Resources EVALUATION (Chapter 9) Evaluation of Content Development Process Evaluation of E-Learning Environment Evaluation of E-Learning at the Program and Institutional Levels Assessment of Learners
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The E-Learning Framework can be applied to e-learning of any scope. This "scope" refers to a continuum defined by the extent to which instruction is delivered on the Internet and hence must be systematically planned for. The weight placed on any e-learning dimension or sub-dimension, or on any set of e-learning items, will vary with the scope of the instruction. This continuum is described below, with examples, to show the type and scope of e-learning activities and how their design relates to various dimensions of the framework.

At the "micro" end of the continuum, e-learning activities and information resources can be designed for face-to-face instruction in educational and training settings (e.g., blended learning activities). In the high-school physics classroom, for example, a teacher can use Shockwave simulations to support the cognitive work of analyzing data, visualizing concepts, and manipulating models. See, for example, the simulations available at Explore Science (<http://www.explorescience.com>.) The teacher would have to design activities that provide context for and elaboration of this highly-visual, Web-mediated simulation. In a traditional course, the E-Learning Framework's *institutional* and *management* dimensions will matter much less than the *learning strategies* section of the *pedagogical* dimension (Table 1.3) which provides guidelines for integrating the simulation into the curriculum.

Further along the continuum, more comprehensive design is required for the complete academic or training course, where content, activities, interaction, tutorials, project work, and assessment must all be delivered on the Internet. Petersons.com provides links to a large number of such courses that are exclusively or primarily distance-based. (The Petersons

database can be searched at <http://www.lifelonglearning.com>). Additional dimensions of the E-Learning Framework will be useful in designing such courses.

Finally, at the "macro" end of the continuum, the E-Learning Framework can serve the design of complete distance-learning programs and virtual universities (Khan, 2001a), without a face-to-face component, such as continuing education programs for accountants or network engineers. Petersons.com, again, provides links to dozens of such programs as well as to institutions based on such programs. For example, designers of Web-based continuing education for accountants dispersed all around world would have to plan for every dimension of the E-Learning Framework in considerable detail. They would have to work with computer programmers, testing specialists, security professionals, subject-matter experts, and accountants' professional organizations. These designers would have to do everything from planning a secure registration system to considering cultural and language differences among accountants seeking continuing education credit.

As the scope of e-learning design expands, design projects change from one-person operations to complex team efforts. *The E-Learning Framework can be used to ensure that no important factor is omitted from the design of e-learning, whatever its scope or complexity.*

You might wonder: *Are all sub-dimensions within the eight dimensions necessary for e-learning?* You might also wonder: *There's a lot of questions here! Which ones do I need to address?* Again, it depends on the scope of your e-learning initiative. To initiate an e-learning degree program, for example, it is critical to start with the institutional dimension of the E-Learning Framework and also investigate all issues relevant to your project in other dimensions. In this case, a comprehensive readiness assessment (see *readiness assessment* section of institutional dimension in Chapter 2) should be conducted. However, to create a single e-learning lesson, some institutional sub-dimensions (such as *admissions*, *financial aid*, and others) may not be relevant.

Designing open, flexible, and distributed e-learning systems for globally diverse learners is challenging; however, as more and more institutions offer e-learning to students worldwide, we will become more knowledgeable about what works and what does not work. We should try to accommodate the needs of diverse learners by asking critical questions along the eight dimensions of the framework. The questions may vary based on each e-learning system. The more issues within the eight dimension of the framework we explore, the more meaningful and supportive a learning environment we can create. Given our specific contexts, we may not be able to address all issues within the eight dimensions of the framework, but we should address as many as we can.

Review of E-Learning Features with the Framework

As indicated earlier, all e-learning features must be designed to help students achieve their learning goals. An e-learning program consisting of well-designed instructional features can lead to its success. The eight dimensions of the E-Learning Framework can identify the critical issues of an e-learning environment, and provide guidance on addressing them. We can improve the effectiveness of an e-learning feature by answering the questions raised in the framework. For example, *ease of use* is one of most important features in an e-learning environment. In Table

1.4, an e-learning feature (i.e., *ease of use*) is reviewed for its effectiveness in a course from the perspective of each of the eight dimensions.

Table 1.4: Review of an E-Learning Feature with the Framework

E-Learning Feature	E-Learning Dimensions	Issues/Concerns
<i>Ease of Use</i>	<i>Institutional</i>	Are instructor/tutor and technical staff available during online orientation?
	<i>Management</i>	Does the course notify students about any changes in due dates or other course relevant matters such as server down?
	<i>Technological</i>	Are students taught how to join, participate in, and leave a mailing list?
	<i>Pedagogical</i>	Does the course provide a clear directions of description what learners should do at every stage of the course?
	<i>Ethical</i>	Does the course provide any guidance to learners on how to behave and post messages in online discussions so that their postings do not hurt others' feelings?
	<i>Interface design</i>	How quickly can users find answers to the most frequently asked questions on the course site?
	<i>Resource support</i>	Does the course provide clear guidelines to the learners on what support can and cannot be expected from a help line?
	<i>Evaluation</i>	If learners are disconnected during an online test, can they log back and start from where they left off?

There are questions similar to those in Table 1.4 that can be used to review how a feature such as *ease of use* can be made a part of an e-learning program. All these questions in Table 1.4 covering the eight e-learning dimensions point to one critical element, *is it really easy to use?* Therefore, for each feature we should explore as many issues as possible within the eight dimensions of the e-learning environment.

QUESTIONS TO CONSIDER

Can you think of any e-learning components not included in the seven categories of components listed in the chapter?

Can you think of any e-learning features not included in the chapter?

ACTIVITY

1. Using Internet search engines, locate at least one article that discusses various e-learning components listed in the seven categories. Discuss how they (i.e., components) contribute to various learning features.

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