DISTANCE EDUCATION:
TECHNOLOGIES, ISSUES AND CONSIDERATIONS

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Abstract

Distance education has become a hot topic in higher education institutions. Today many universities offer college degrees to adults with work and family responsibilities and to the college level students. However, there are important issues and considerations in order to create a well-organized, successful distance-learning environment. Distance educators argue that pedagogical, organizational, institutional and ethical issues are quite important factors in addition to technological issues to have successful implementations in a distance-learning environment.

Key word: Distance education

Özet

Uzaktan eğitim, yüksek eğitim kurumlarında önemli konulardan birisi haline gelmiştir. Bugün birçok üniversite, aile ve iş sorumluluğu olan yetişkinlere ve üniversite düzeyindeki öğrencilere üniversite diploması sunmaktadır. Fakat başarılı ve iyi organize edilmiş bir uzaktan eğitim ortamı sunmak için önemli konu ve sorunlar vardır. Uzaktan eğitimciler pedagojik, örgütsel, kurumsal ve etik konuların teknolojik konularla birlikte uzaktan eğitimin başarılı bir şekilde uygulanmasında önemli etkilerinin olduğunu tartışırlar.

Anahtar kelime: Uzaktan eğitim

1. Introduction

In today's world a college degree has become an invaluable credential for a rapidly increasing number of professions. However, studying for a degree in a traditional manner demands major time commitment. For working professionals with family responsibilities, the pursuit of knowledge and training in the traditional manner is gradually becoming unattainable (Atieh, 1998). Therefore, for many thousands of working adults, the commitments involved in maintaining a career, along with the pressure and

demands of family life form an obstacle to returning to a traditional school to earn a college degree or master's degree (Duffy, 1997). However, advances in computer and communication technologies affect every aspect of our lives. Education is not an exception. Today many fully accredited colleges and universities offer a wide variety of on-line programs to working professionals and college students via computer and communication technologies (Atieh, 1998). In this study, I discussed distance education from past to present, and technologies and services for distance education. Finally, I discussed important issues and considerations in distance education.

2. Distance Education: Past and Present

Although distance education started as correspondence study in the mid-1800s, it was not until 1972 that the International Council for Correspondence Education (ICCE) invented the term distance education. The term describes the family of educational practices that had developed through the years around correspondence education (Moore, 1990).

Historically, there are three levels in distance education, according to Williams et al., (1999). Level 1 (1880s - 1960s) represents printed materials, radio transmissions, and audio and videotapes. That level is considered passive distance education since there was no opportunity for the learner and instructor to interact in a real time setting. Level 2 (1960s - 1990s) represents two-way audio teleconferencing, one-way video/two-way audio teleconferencing, computer-based training disks, CD-ROMs, laser disks, e-mail, computer-mediated conferencing, audio graphics and two-way interactive audio/video transmissions. Level 2 is considered passive to moderately active.

Level 3 (1990s - 21st century) represents hybrid environments that combine in one virtual classroom elements of all the distance education and distributed learning technologies as well as capabilities of the Internet and World Wide Web (Williams et al., 1999). In this kind of environment there is no one primary source of distribution. Instead, the characteristics of the subject or course being taught determine which technologies might be the primary or instructional form of distribution and which might be secondary or support forms of distribution (Williams et al., 1999).

3. Technologies and Services for Distance Learning

Communication technologies fall into different families: e-mail,

distribution lists, forum and conferencing, chat, desktop audio and video, and integrated tools. Each family reflects both the timing and the richness of the communication, supports different types of task and offers different advantages for use in distributed learning environments (Table 1).

Table 1. Software and services for online communication.

Family communication tools	Timing of communication	Richness of communication
E-mail	Asynchronous	Low: text only, but some can be enriched to moderate with attachments and HTML enhancements including hot links.
Distribution Lists	Asynchronous	Low: text only, but some can be enriched with clickable links to Web sites (URLs) and other objects (documents, etc.)
Forum and Conferencing	Synchronous	Low: text only, but some can be enriched to moderate with attachments and HTML enhancements including clickable links.
Chat	Synchronous	Moderately low: text, but presence enhanced by synchronous timing.
Desktop Audio Video	Asynchronous, synchronous	Moderate to high depending on extent to which hardware and network support vocal intonation and physical gesture; richness immediacy of response is lost.
Integrated Tools	Asynchronous, and/or synchronous	Varies according to tools included.

Source: Klobas & Renzi, 2000, p. 48.

3.1 E-mail

E-mail is the most common asynchronous communication medium in distance learning environments. It has long been possible to attach objects of any kind (from documents to multimedia enriched files) to e-mail. Recent technological developments make it possible to enrich the message itself by inserting HTML code in the body of the mail. It is possible to add different styles and colors to the text, to embed images or to reproduce full HTML pages (Klobas & Renzi, 2000). Also, e-mail is personal messaging in which learners and teachers can work one-on-one. Through the use of e-mail, the teacher can communicate with a learner, and a learner can exchange information with other learners. Therefore, e-mail is a medium to facilitate learning activities by gaining feedback from the teacher or other learners. Some distance programs also provide voice mail systems for learners to communicate with others via voice rather than the text form of e-mail

(Huang, 2000).

3.2 Distribution Lists

Distribution lists are systems where e-mail messages are sent to a centralized server, and from there distributed to lists of addresses. Use is as simple as sending an e-mail (Klobas & Renzi, 2000). Online discussion groups enable learners in distributed learning environments to converse about interesting topics with others. These discussion environments include list services (listserv) and newsgroups. Listservs have become a large discussion group on the Internet that facilitates e-mail distribution among members who subscribe to the listservs from anywhere. Newsgroups are similar to listservs, but newsgroups need users to actively participate for discussion while listservs' users passively receive the information from individual e-mail accounts (Huang, 2000).

Furthermore, Web-based distribution listservs are emerging. For instance, ONElist offers Web-based creation and maintenance of distribution lists with a range of options (e.g., public or private, moderated or unmoderated, etc.) and the list's archive is searchable. It is therefore now possible to use a free Web-based service to establish and maintain distribution lists, without the need to maintain a local server or software mounted locally. Now there is a trend toward integration of discussion lists with larger, integrated Web-based communication services and community building software. For example, eGroups enables creation of communities with a home-page, file space and more (Klobas & Renzi, 2000).

3.3 Conferencing Systems

Conferencing systems, also known as forums or discussion database organize messages in a **"tree"** structure. Messages are grouped in **"threads"** which allow participants to follow the sequence of messages exchanged in several discussions held in parallel. Sophisticated conferencing systems develop outside the Web and proprietary systems still provide the most functionally through specialized servers. However, many proprietary systems, e.g., Domino/Lotus Notes, FirstClass, now provide access through Web browsers (Klobas & Renzi, 2000).

3.4 Chat-room

Chat-room is a text-based synchronous communication environment. As it can be used with more than two users at the same time, its applicability to discussion groups in the production version of the project is more likely

(Nichols, 1997). Some richness is provided by the immediacy of communication where another person's words appears on the screen line-by-line or character-by-character (increasing the feeling of presence). Chat systems are often structured in **"rooms"** with public or private conferences, but some systems (e.g., ICQ and PowWow) allow direct point chat between two or more participants (Klobas & Renzi, 2000).

3.5 Audio and Video Tools

As asynchronous communication tools audio and video have a long history under the category of educational media for presentations and for interactive activities. The family of streaming technology and related software e.g., RealAudio, and RealVideo, has been a significant advance in one-way presentation of material from the Web. Audio and Video tools not only enables educators to record interesting material which surprisingly little effort but also broadcast of recordings via the Web (Klobas & Renzi, 2000). Also, an advanced Internet telephony market, free software, e.g., Microsoft's NetMeeting, and the adoption of standards have now made synchronous desktop audio and video communication both accessible and affordable. For instance, several products allow direct connection between tow users' computers as other solutions enable more computers to participate in live conferences via servers (Klobas & Renzi, 2000).

In addition, an effective use of multimedia and other audio and video tools requires sufficient bandwidth and hardware since images, audio, and graphics take more bandwidth that plain text (Huang, 2000). Thus, the users should have advanced related hardware and adequate size of network or bandwidth to be able to run the multimedia programs.

3.6 Integrated Tools

A sophisticated family of tools, e.g., ICQ and PowWow, provides integration of synchronous communication with other services that improve accessibility and functionality of synchronous communication. In general these tools maintain a list of Internet users, i.e., members of a collaborative learning group, with whom the user would like to keep in touch and provide information whether or not users on the list are currently connected to the Internet and free to communicate. While the best known integrated tools require specialized client software, other forms of integration are provided by the Web-based collaboration services, e.g., Lotus Domino/Notes, E-res, (Klobas & Renzi, 2000).

3.7 CD-ROM

The CD-ROM is characterized by a large storage capacity for video, audio, animation and interactive multimedia (Huang, 2000). A CD-ROM, once authored, is immutable, but may offer high quality resources in structured context (Hedberg et al., 1997). Many distance learning programs incorporate substantial use of interactive multimedia learning by using CD-ROM. CD-ROMs can not only provide structured courses with well designed programs, but they can also offer various representations in any combination of media formats e.g., text, image, graphics, sound, and animation (Huang, 2000).

Using interactive CD-ROM multimedia to model the knowledge base and to give the learner freedom to interact with it gives autonomy back to the learner. Rather than providing a set of pre-designed sequences that assume one learning model, a more interactive approach can be developed by giving the learner a bounded information landscape and the tools necessary to explore and investigate the information (Hedberg et al., 1997).

Also, using CD-ROMs learners in distance learning environments can study the content through their own computers, not only online environments. For instance, a CD-ROM can be an effective tool for the purpose of individual drill and practice (Huang, 2000).

4. Issues and Considerations in Distance Education

Technological issues are important concerns to have an effective and efficient distribution in a distance-learning environment (DLE). Issues such as bandwidth, speed of communication lines, and costs of hardware and software should be considered carefully in a DLE. Also, computer, modem, and network connection are very important concerns as well as access to hardware and software. Interaction among the faculty and learners without access to the technology in a distance-learning environment is impossible. How to use hardware and software is an associated concern as well (Hill, 1997).

In addition to the technological issues, pedagogical issues are rather important in distance learning environments. Pedagogical issues are related to instruction and learning. According to the distance educators, pedagogical issue pertains to the importance of the medium in distance learning environments. For instance, educators such as Winn (1990) argue that the

medium often drives the methodology, causing constraints on instruction. Also, Hill (1997) discusses that reliance on the technology for distribution of instruction increases the constraints exponentially. In addition, in a study with 285 learners, one tutor, and 12 junior academic coaches, Bostock (1997) analyzed the relationship between the Web and active learning when he was teaching a new course about the Internet to arts and humanities college students. He stated that simply placing lecture content on Web pages gives flexible access but makes no contribution to active learning. But, he also noted that Web forms and e-mail were essential for communication and interaction among the tutor, coaches and the learners. According to Jonassen, Peck and Wilson (1999), learners generally learn no differently from technologies or teachers when delivering instructional messages. Instead, technologies should be applied to engage learners in active learning, constructivist learning, intentional learning, authentic learning and cooperative learning (Jonassen, Peck & Wilson, 1999). Distance educators (i.e., Dede 1996; Cyris 1997; Khan, 1997) discuss that technology is effective in providing time and place flexibility and to eliminate barriers of distance. However, technology is not effective in teaching and learning when it is used to convey or deliver instructional messages to a passive learner (Jonassen, Peck & Wilson, 1999; Bostock, 1997).

Thus, the incorporation of several pedagogical methodologies and strategies in the distance learning environments contribute to breaking the constraints (Hill, 1997). Khan (1997) notes that learning and instructional theories, instructional design and curriculum development should be important components of the distance learning environments and web-based instruction.

In addition to the pedagogical issues, organizational issues also pertain to the preparation of the distance learning courses and projects (Hill, 1997). Planning for the courses and projects is one basic issue falling under organizational category. Course and project planning and preparation are important activities within the context of distributed learning. Faculty or facilitators should think several weeks or months ahead to produce the Web site, materials and to find appropriate information resources as well as enabling access to the tools to use the materials (Hill, 1997). Furthermore, an online learning environment or Web-based learning environment should include many resources, support collaboration, implement Web-based activities as part of the learning framework, and support both learners and faculty (Sherry & Wilson, 1997).

Moreover, institutional issues are important considerations in a distance-learning environment. Institutional issues are policy-related factors usually decided by the organization involved in the distributed learning environment. That area includes several concerns such as faculty development, promotion and tenure, course credit, payment, course validity and evaluation (Hill, 1997).

Ethical considerations are another important issue in a distance-learning environment. They need to be considered in any process such as admission, intake and retention of students, program and course marketing, program and course administration, course development and presentation, learner /faculty interaction, learner/learner interaction, and program, course and learner evaluation (Hill, 1997).

Finally, all issues discussed above should be considered carefully while initiating a learning environment at a distance. The more planning and support provided, the easier it will be for all participants to effectively experience distributed learning (Hill, 1997).

5. Conclusion

In the 21st century we see more and more advanced technology in the distance learning environments, however according to many distance educators, having the advanced technology does not guarantee to achieve the goals in a distance learning environment. Pedagogical, organizational institutional and ethical issues are quite important factors in addition to technological issues to have successful implementations in a distance-learning environment. Distance educators discuss that technology is effective in providing time and place flexibility and to eliminate barriers of distance. But, technology is not effective in learning when it is used to convey or deliver instructional messages to a passive learner. Therefore, the incorporation of several pedagogical methodologies and strategies in the distance learning environments contribute to overcome the barriers.

References

Atieh, S. (1998). How to get a college degree via the Internet. Rocklin, CA: Prima Publishing, Inc.

Bostock, S.J. (1997). Designing Web-Based Instruction for Active Learning. In B H. Khan (Ed.), Web-based instruction (pp. 225-237). Englewood Cliffs, NJ:Educational Technology Publications.

Crys, T. E. (1997). Teaching and learning at a distance: What it takes to effectively

design, deliver and evaluate programs. Englewood Cliffs, NJ: Jossey-Bass Inc.
Duffy, J. P. (1997). College on-line: How to take a college courses without leaving home. New York, NY: John Wiley & Sons, Inc.
Dede, C. (1996). The evolution of distance education: Emerging technologies and distributed learning. The American Journal of Distance Education, 10 (2), 5-35.
Hill, J. R. (1997). Distance learning environments via the world wide web. In B. H. Khan (Ed.), Web-based instruction (pp. 75-80). Englewood Cliffs, NJ: Educational Technology Publications.
Huang, H. (2000). Instructional technologies facilitating online courses. Educational Technology 40 (4), 41-46.
Hedberg, J., Brown, C., & Arrighi, M. (1997). Interactive multimedia and Web-based learning: Similarities and Differences. In B. H. Khan (Ed.), Web-based instruction (pp. 47-58). Englewood Cliffs, NJ: Educational Technology Publications.
Jonassen, D. H., Peck, K. L. & Wilson, B. G. (1999). Learning with technology: A constructivist perspective. Upper Saddle River, NJ: Prentice Hall, Inc.
Moore, M. G. (1993). Contemporary issues in American distance education. Elmsford, NY: Pergamon, Inc.
Khan, B. H. (1997).Web-based instruction (WBI): What is it and why is it? In B. H. Khan (Ed.), Web-based instruction (pp. 5-18) Englewood Cliffs, NJ: Educational Technology Publications.
Klobas J., & Renzi, S. (2000). Selecting software and services for Web-based teaching and learning. In A. Aggarwal (Ed.), Web-based learning and teaching technologies: Opportunities and challenges (pp. 43-59). Hershey, PA: Idea Group Publishing.
Nichols, G. W. (1997). Formative evaluation of Web-based instruction. In B. H. Khan(Ed.), Web-based instruction (pp. 369-374). Englewood Cliffs, NJ: Educational Technology Publications.
Sherry, L. & Wilson, B. (1997). Transformative communication as a stimulus to web innovations. In B. H. Khan (ed), Web-based instruction (pp. 67-74). Englewood Cliffs, NJ:Educational Technology Publications.
Williams, M. L., Pabrock, K., & Covington, B. (1999). Distance learning: The essential guide. Thousand Oaks, CA: Sage Publications, Inc.