Turkish Online Journal of Distance Education-TOJDE October 2002 ISSN 1302-6488 Volume:3 Number:4

Accomplishing Access & Equity in Education: Using the Web to Design and Deliver Courses Online

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Introduction

World Wide Web (WWW), commonly know as Web, is a mega hypertext/hypermedia communication and information network on the Internet. Using hypertext links rather than a hierarchical menu structure, the Web links are non-linear structured in chunks or nodes of information that allows users multiple access possibilities (Dillion & Zhu, 1997). Rather than using a text-based interface, the Web uses a graphical interface by combining hypermedia links to electronic photo, graphics, audio and/or digital video facilities in an electronic interactive environment. This network, a collection of computers and peripheral devices connected together, allows users to create, send and receive electronic data throughout the World (Jonassen, 1999). Therefore, worldwide resources have become easily accessible through the Web.

The Web has opened a powerful, dynamic, open and flexible collaborative electronic milieu to communicate, share and exchange global resources, knowledge and information online. This network, also, has a power to bring the World to our homes, offices and classrooms or wherever we access it. Therefore, the Web has become one of the most crucial media for learning and teaching activities by providing new rich online educational experiences for us in time.
Nowadays, each education system from the globe has been trying to employ the Web into its curriculum. As a result, the traditional methods and activities of the face-to-face learning and teaching milieus are changed rapidly and converted online. By changing the face of education, in other words, the Web has opened the new ways of learning and teaching.

The Web, however, cannot automatically help learners improve their learning skills, and faculty develop their teaching methods and strategies. The Web itself is just an electronic data source. Like the design of any instruction, designing the Web as an instructional tool must include certain design models based on instructional theories, methods and strategies (Kurubacak, 2000). Using the Web as an instructional tool requires carefully redesigning and revolutionizing learning and teaching milieus to design and deliver courses online.

Theoretical Background of Using the Web for Designing and Delivering Online Courses

The Web continues to grow in education. In the past few years, the delivery information over virtual environments among universities, colleges, faculties and learners has increased. Online courses have become a crucial aspect in any level courses. Therefore, a number of learners are involved in online educational projects with other schools around the World (Tolley, 1999).

The accessibility and flexibility of online learning creates convenient global communication settings in education. In the fall 1997, the University of Minnesota College

of Education and Human Development (CEHD) administration charged an international Web development team with designing and maintaining a standardized Web presence for higher education in the United States. This increased the interests of colleges to deliver instructional information and materials via the Web. It is estimated that roughly forty percent of colleges and universities in the United States either have online programs or have been developing web-based course today.

Although online learning can provide tremendous potential for education, it must be well designed, which depends on several critical issues. In particular, online learning must encourage learners and instructors around the World to share and exchange their learning experiences, strategies and methods. Moreover, online learning must provide a framework for producing a virtual learning environment to improve productivity and quality for both learners and instructors. It must connect learners and instructors each other virtually to encourage the use of global online resources.

Mory, Gambill and Browing (19987) examined the experiences of two university graduate learners while taking an online course over the Web to identify design, implementation and motivation issues. These two learners reported these following four points: 1) discussion among learners is beneficial, 2) there is an artificial politeness between them in the written interactions, 3) the communication with instructors is good, primarily utilizing email; and 4) they need more visual and auditory medium rather than text. According to their study, Gambill and Brown strongly suggest that the instructor must encourage student success by adjusting course environments and revising assignments and readings, sufficient technical support for the instructor and learners should be provided, a variety of presentation formats including visual and audio materials should be provided for learners, and the instructor should provide a detailed schedule and timeline to learners, so they can stay on the right track.

Research in the social context of learning provides substantial support that traditional teacher-centered approaches must be replaced with learner-centered environments in educational environments (Alexander & Murphy, 1994). Unlike traditional learning settings, online learning is a complex process that supports a student-centered learning environment, and involves interactions among learners, instructors, contents and the educational environment.

Bostock (1997) mentions that communication between learners and instructors plays a vital role in online learning milieu. Simply placing course content on the Web gives flexible access to learners, but makes does not require in active learning. The Web distribution must allow more flexibility in responding promptly to learners' concerns and needs. Learners in virtual environment must do more than simply receive information (Duffy & Jonassen, 1992). To engage and participate in activities and tasks to enhance comprehension, understanding, and knowledge, Bonk and Cummings (1998) outline ten key points on how to design a learner-centered online learning setting: 1) provide a safe learning community, 2) foster engagement, 3) give choices, 4) facilitate learning, 5) offer feedback, 6) support apprentice learning, 8) use recursive tasks, 9) build on the Web links, and 10) be clear and help promptly.

Online learning stimulates a range of innovative applications influencing the learning methods and techniques. Learning on the Web can provide more concrete experiences than learning by traditional instructional tools. Online learners, however, must acquire knowledge in deferent ways and construct their own learning scaffold on the Web.

A well-designed online course can result significantly better learning scores. Learners working with the web-based system spend more time to study the subject, which did affect their performances. Schutte (1996) reports that a well-designed online learning must be significantly higher peer contact, better understanding of course materials, greater effect on learning, flexible, and more time spend on class work. Based on the

studies given below, online learning must have at least these three main aspects (Bonham & Seifert, 1999): 1) allow learners to actively chose learning paths and reflects their own needs and interests (multi-linearity or non linearity characteristics), 2) promote incidental and contextual learning through interconnected subjects and ideas (de-centering or connective property), and 3) dissolve the time and place barriers (virtual presence).

Online learning must include an active and constructive learning process. Learners can interpret the main idea and construct the meaning from the material. It must provide one of the best accomplished learning milieus to engage learners in constructing knowledge by acquiring, generating, analyzing, manipulating, and structuring information (Jonassen, 1999). Therefore, nowadays, the use and effectiveness of instructional online activities are the main focus of much research on online learning (Beyer, 1998; Hackbarth, 1997; Soloway & et. al., 1991; Soloway, Guzdial & Hay, 1994). Online learning can provide many instructional activities for learners. For example, email is a useful tool for collaborative activities among learners from all over the World (Bonk, Appelman & Hay, 1996). Bulletin board allows learners to set up and present their own multimedia documents and resources (Bonk & Reynolds, 1997). The Web conferencing, electronic discussion and interactive chat windows create virtual classrooms providing three-dimensional interaction between learners and resources (Bonk, Appelman, & Hay, 1996; Bonk & Reynolds, 1997). The virtual electronic classroom, however, is a unique contribution, but a complex field to build educational knowledge.

Martindale and Ahern (1998) also strongly emphasize web-based intervention. Most online participants, who are very familiar with the Web and subject matter, are successful in mastering the instructional content. These participants, also, are ready for the Web intervention much earlier than slower-processing participants. The slower-processing participants have difficulties accessing information. They are new to the Web use and electronic mail. These learners also have difficulty entering a URL and navigating through a Web page that they request more details on how to complete the intervention. These slower-processing learners need basic work on the Web use. Another study conducted by Black, Klingenstein and Songer (1997) has shown that learners did not like to collaborate via the Web, because they stated a desire fore more information and instruction on how to utilize online learning.

Developing effective online learning requires more than just using the operational capabilities of the Web. The instructional design principles must be integrated into learning environment for three major purposes: 1) define and implement learning strategies to function as information processors that can help learners understand, retain and apply the online material; 2) provide individualized feedback to learners while learning with this new environment; and 3) determine media combinations and appropriate interactivity level and learning strategies to fit the learners.

Using the Web for Designing and Delivering Courses Online

Online learning (OL) can be defined as taking advantage of the Web potential based on instructional design principles to design information. It is a novel approach for delivering educational information and activities on the Web. There are numerous names for online learning (Khan, 2000): Web-Based Instruction (ONLINE LEARNING), Web-Based Learning (WBL), Web-Based Training (WBT), Internet-Based Training (IBT), E-Learning, Distributed Learning (DL), Advanced Distributed Learning (ADL), Distance Learning, Mobile Learning (or m-Learning) or Nomadic Learning, Remote Learning, Off-site Learning, etc. In this article, the online learning term represents an open, flexible and distributed learning milieu for designing and delivering courses on the Web.

Khan (1997) defines online learning as "...a hypermedia-based instructional program which utilizes the attributes and resources of World Wide Web to create a meaningful learning environment where learning is fostered and supported." Not only does the Web

improve our educational lives, but also it allows us to participate in a wide range of educational experiences online.

Relan and Gillami (1997) also define online learning as "...the application of repertoire of cognitively oriented instructional strategies within a constructivist and collaborative learning environment, utilizing the attributes and resources of..." the Web. According to them, the online instructional strategies must be designed in the following ways (Relan and Gillami, 1997): 1) as a resources for identification, evaluation, and integration of a variety of information, 2) as a medium of collaboration, conversation, discussions, exchange, and communication of ideas, 3) as an international platform for the expression and contribution of artistic and cognitive understandings and meanings, and 4) as a medium for participating in simulated experiences, apprenticeship, and cognitive partnership.

This electronic learning setting allows learners the ability to interact and collaborate with other learners, professors and experts beyond the walls of their traditional classrooms. It seems that time and space limitations will no longer be an essential barrier for the educational settings since the Web has begun to provide totally new learning experiences to us.

The learners in online courses generally are responsible for their learning process and results (Reeves, & Reeves, 1997), have the freedom to move from their environment to anywhere all over the World (Soloway, Guzdial, & Hal, 1994), have a choice of content, time, resources, feedback, and a variety of media for expressing their understanding (Khan, 1997), can explore existing resources and information according to their needs and interests (Dyrli & Kinnaman, 1996; Farr &Tone, 1994; Khan, 1997), can construct their own knowledge by engaging learners' thinking skills (Duffy & Cunningham, 1996; Jonassen, 1999), can learn through exploring the foundations, justifications, decisions and value of a fact, principle, skill, or concept knowledge (Jonassen, 1999), have a choice whether actively participate in learning activities or just observe them in the background (Kirkley & Bolling, 1995), and meet their own specific needs in self-paced and self-assessing environment (Khan, 1997).

Online learning is an important medium for designing and delivering instruction by addressing a variety of learning styles (Khan & Vega, 1997). The learning milieu is redesigned for learner-centered rather than teacher dominated learning. Today, this trend can be observed in many educational environments.

To use the Web for designing and delivering courses online, it must be developed an online education model, which provides us a useful framework to describe, analyze and evaluate the virtual education settings. This theoretical framework of online education must include a theory of learning and to describe the design features of an online course. This theoretical framework has three dimensions associated with online learning: 1) overall design such as the theoretical or pedagogical basis, instructional approach, etc.; 2) instructional methods and their strategies such as the transmission of course content, the facilitation of learners learning, fostering student collaboration and participation, etc., and 3) instructional activities such as electronic mail, Listservs, the Internet links, multi-user domains, etc.

A Model for Designing and Delivering Courses Online

Today's existing online courses in education have generally occurred in three ways (Khan, 2000): 1) classroom-based instruction including information posted on the Web as an alternative delivery mode for information presented in class, 2) classroom-directed learning supplemented with specific web-based activities, and 3) courses delivered totally online relying on web-based resources as a delivery system for course interaction. The

courses deliver via the Web must be examined through an online learning model, which provides the basic instructional elements for effective online design. This online leaning model, also, must demonstrate a continuum of approaches, philosophies, methodologies, and instructional activities in order to provide effective instructional interactions not only faculty, but also learners.

To use the Web for designing and delivering any type of online courses, it must be developed an online learning model, which provides us a useful framework to describe, analyze and evaluate the virtual education. This theoretical framework of online learning must include a theory of learning and to describe the design features of an online course. The many overall instructional approaches can be used for delivering instructional information over the Web. Theoretical framework, however, must have dimensions associated with online learning, such as the theoretical basis and instructional approach, instructional methods and their strategies and instructional activities. A particular learning theory, however, can be applied to deliver and design online learning. Therefore, "...the deliberate selection of a particular theoretical position provides the necessary basis for corresponding instructional methods... (Bannan & Milheim, 1997)" for online learning.

Kurubacak (2000) modified the Bannan & Milheim online learning model (1997) to design and deliver courses online to provide a useful framework for analyzing and describing

educational web-based materials (Table 1 please click here).

The specific purposes of Bannan & Milheim online learning model consisted of three dimensions (Bannan & Milheim, 1997): 1) the overall design characteristics of a specific course including its basic instructional model and the conceptual learning theory represented by its design, 2) the general instructional methods including learning strategies. For example, the transmission of course content, the facilitation of student learning, fostering collaboration and participation, role playing, and modeling of previous student work, and 3) the instructional activities including items such as email, multi-user domains, and Listservs, etc. Bannan and Milheim (1997) declare that their theoretical framework for online learning included the learning theory and its instructional model to describe the design features of a specific course. Thus, this model can assist "... instructors, researchers, and course developers in their pursuit of quality... (Bannan & Milheim, 1997)" online learning.

The model developed by Kurubacak determines online instructional approach, the theoretical and educational foundations of the approach, and the potential virtual strategies, methods and instructional activities (Table 1). The author, also, point out that must involve the control of learning activities and significantly impacted the online learning methods. This modified model has two main dimensions: 1) Online dissemination, and 2) online collaboration and facilitation.

Online Dissemination

Online learning becomes an alternative medium for delivering instructional information by addressing a variety of learning styles (Khan & Vega, 1997). At the same time, it is an open system and self-directed-learning environment, which fosters more learner control. The instructor cannot wholly control learners who can access any pages directly on the Web. The instructor does not know exactly how learners interact with other learners, instructors or online information into online learning.

Online dissemination has these three main features: 1) break the artificial wall between the classroom and the world (Kurubacak & Gonzales, 2002; Khan, 1997), 2) address real world problems and issues relevant to learners by bringing realism and authentic learning experiences to learners and instructors (Bonk & Kira, 1998; Jonassen, 1999; Savery &

Duffy, 1996), and 3) allow learners to share and exchange information as one person to other and/or one person to the entire world (Bonk & Kira, 1998). In short, the Web allows instructors and learners to collaborate and interact with each other beyond the classrooms without time and geographic space limitations.

Online learning uses a systematic approach to deliver a cross-cultural communication course (Zhu & Vazquez-Montilla, 1999). Online learners can connect their knowledge and practice, and have more in depth reflection in the construction of knowledge when learning online. Although these are diverse learners, and have different learning styles, they can collaborate with each other online. Online learners use learner-centered and reflective knowledge construction, and previous experiences as learning strategies. Bonk (1999) suggests the following five levels to design and deliver course via the Web: 1) online syllabus (instructors use the Web to promote course and teaching ideas), 2) student explorations of online resources (learners use the Web to explore previous resources, both in and outside of class), 3) learners generated resources published on the Web (learners use the Web to generate resources and exemplary products for the class), 4) online course resources (instructors use the Web to create and present class resources, such as handouts, prior learners work, class notes), and 5) repurpose online resources (instructors take the Web resources and course activities from one course and, making some judgments, use them in another).

In summary, a well-designed online learning must cover at least these three characteristics: 1) an online course syllabus to give information in detail about the course and its activities, 2) the related online resources and their URL addresses provided by both instructors and learners, and 3) online assignments, works and/or projects to share and exchange the knowledge.

Online dissemination of the modified online model by Kurubacak has three subsections: 1) posting information online, 2) online link sources, 3) posted projects online. The researcher found more research on link sources when reading the related resources.

Posting Information Online

Posting information online is a key way for instructors to organize and disseminate resources. Before taking an online course, learners can view both course and instructor information on the net (Bannan & Milheim, 1997). Instructors can post online course syllabus, assignments, reviews, sample exams, frequently ask questions about assignments, and personal information about the teacher.

To deliver course information and learning activities, instructors have to design a course Web page. In order to develop an effective course Web page for online class, instructors must first assess the experiences and concerns of the other instructors who have already developed and taught an online course. The needs and interests of the learners have a great value to instructors to design interactive a course Web page. Designing a course Web page is essential for learners and instructors to interact with each other online as well. It is a necessary to design a course Web page for an online course. Not only must this page support online collaboration among learners, but also provide necessary and updated information based on the concerns and needs of online learners.

Rebelsky (1999) worked on online information design. The learners were generally satisfied with the resources provided online. According to Rebelsky (1997), learners did not use all resources provided for them in this study. However, different learners used different resources. Also, different learners found different resources useful. The most commonly used resources were the class outlines and frequently ask questions and answers. The majority of learners in this study indicated that they preferred using the resources chosen for them. Also, they preferred printing out online resources provided for

them. The researcher observed that providing more important documents and the Web resources to learners helped them prioritize class resources. Like Rebelsky, Koschmann (1994) analyzed forty-one political science courses with their own Web pages on the Web. He found that the typical course site was digital resting place for a variety of course materials that could more easily be distributed to learners in printed format.

In short, instructor must design a course Web page to promote course and teaching ideas via the syllabus. Online activities, also, must be integrated in an online syllabus, such as student publications of exemplary work; online cases, tests and quizzes; class polling, case voting and suggested the Web links; email pals, critical friends, and mentoring; virtual debates, reflections and reactions; and an evaluation for the course Web site (Bonk, 1999).

Online Link Sources

The Web provides ability to online learners to a vast amount of the Internet-based resources including text, audio, graphics, and video. The Web itself is a huge data collection, and an immensely powerful research tool. Harasim and her colleagues (1995) describe the linkage between online communities and the vast resources on the Web as knowledge networking. This network provides flexibility to navigate online resources by supporting learner control and self-directed learning. Therefore, learners can explore their own interests and needs, and become active in their own learning by using collaborative strategies (Romiszowski & Mason, 1996). Additionally, not only instructors, but also learners can post their own materials online and link them to resources from throughout the World. Unlike printed resources, these online resources can be easily updated and disseminated by instructors and learners.

Online information resources play an imperative role in offering rich content to learners. To facilitate online learning resources, administrative systems must be wholly functional from the outset of delivery. Online resources (such as special activities, electronic rooms and space, and tools, etc.) require a stable network and enough bandwidth to adequately deliver text, video and audio materials efficiently (Bonk & Kira, 1998). However, there are some essential considerations for resource- related decisions in online learning milieu: 1) determine the requirements, roles, and responsibilities supported in online by faculty and learners, 2) recognize various roles that instructors assume in online, such as moderator, advisor, mentor, etc., 3) complete a substantial analysis and review of online resources, 4) determine short-term and long-term needs for the variety of resources needed to support the project number of learners adequately who enroll in online-delivered courses, 5) review technical resources concurrently with other resources to produce and manage online learning, 6) determine essential information resources needed in online, 7) evaluate the interplay of resources related to degree of support, and 8) provide training and development needs of all learners to serve the resources. Determining unique contributions of online resources is especially crucial to online learning.

Sharing online resources promotes learners active and interactive learning experiences from multiple perspectives (Bonk, Medury, & Reynolds, 1994). Using online link sources provides some key features to learners (Butler, 1998; Donders, Eek, & Remmers, 1995; Goldberg, 1997; Siegel & Kirkley, 1997): 1) communicate with online sources from all over the world, 2) browse through libraries, museums, and archives around the world, 3) use a searchable course glossary, 4) use the search engines to find relevant online searches related to the course content or the research project, and 5) benefit from the experiences and instruction that come directly from the sources. Online learners must organize their own information for online publication. A recent research study looked at how fourth and sixth graders from seven cities in the United States used online resources (Mendels, 1998). This study has showed that learners who used online materials did better work

than those who did not.

The Web has numerous online resources. Therefore, instructors must be careful in examining these online resources to match their teaching and learning objectives (Sherry, 1998) by exploring potential online sources to develop learning content and activities based on learners' prior experiences.

Posted Projects Online

Learners must submit their assignments to engage in discussion. To share and exchange their ideas, learners must post their works and anecdotes on the course Web page to a global audience (Harasim, 1993). They, also, can publish their personal information or photographs.

These socio-cultural activities and links provide more insightful information and a friendly environment to learners. Thus, online learning creates an milieu where online resources are used to help collaborative learning among learners, between learners and instructors, and between a class and a wider community.

Online Collaboration & Online Facilitation

Vygotsky's (1986) socio-cultural theory of cognitive development is rapidly influencing diverse educational arenas. Vygotsky's tenets about learning and development emphasize the importance of social interaction with other people such as adults, more capable peers, or experts. Recent electronic collaboration studies support Vygotskian views that learners internalize the scaffolding of more capable peers. According to Hiltz (1994), collaborative instruction "...means that both teachers and learners are active participants in the learning process; knowledge is not something that is delivered to learners, but rather something that emerges from active dialogue among those who seek to understand and apply concepts and techniques..." (p.23). Collaborative online learning is a learning process that emphasizes group or cooperative efforts among learners and instructors on the Web (Hiltz, 1997). For example, in the Jason project founded by Robert Ballard, learners collaborate with their peers and world experts in science, technology, engineering and social studies. Online learners participate in annual electronic field trips to a network of educational, research and cultural institutions in the United States as well (NASA SeaWIFS Project, 2000).

Pea (1994) describes two modes of online communication that foster collaborative learning: 1) in information transmission (knowledge is imparted to the learner by some from of instruction), 2) in ritual communication (learners share common knowledge and values through socialization and participation with other group members).

Collaboration covers active participation and interaction. Online learning stresses active participation and interaction between learners and learners, between learners and instructors, and between learners and experts (Bonk, Medury, & Reynolds, 1994; Harasim, Calvert, & Groeneboer, 1997). Therefore, an online learning model can organize and structure online interactions among learners, instructors, experts from outside, and/or global online sources with no time and space limitations (Sherry & Wilson, 1997; Harasim, Calvart, & Groeneboer, 1997; Gamas & Solberg, 1997). This model, also, can encourage and engage learners to work with them together on their learning activities (Relan & Gillani, 1997).

Online learning is praised for promoting group work and collaborative learning. It, also, allows learners to contribute more direct learning process (Bonk & Kira, 1998). For example, KIDLINK is one of the largest collaborative projects with 48.000 children in

seventy-seven countries (KIDLINK, 2000). Learners from these countries have been participating with each other since1990 in global projects and dialogs.

Online interaction facilitating collaborative learning and instructional strategies is an imperative and fundamental principle in virtual milieu. Online interaction maximizes the opportunities for on-going interaction among learners, instructors, and experts from a global learning environment. Gunawardena and Zittle (1995) identify five areas affect online interaction, which are learner-centered instruction, participation, social presence, cognitive strategies, and collaborative learning.

To encourage interaction in an online setting, the strategies are given below: 1) learners must judge themselves and express their views; 2) participants must use the Web, email and appreciation of the distance environment; 3) web-based tools must encourage the involvement and interaction among learners, and 4) participants must improve their views regarding the value of learning from their classmates.

Sherry and Myers (1996) developed a collaborative design models including authentic tasks and knowledge development by generating research questions and reflections. They identified an authentic task as taking ownership of a task whose cognitive challenges are consistent with the cognitive demands of design environment. This environment supported knowledge construction and sharing of ideas. Also, this learning setting enables learners to continue work on their own tasks. According to Sherry and Myers, knowledge development is to build a appropriate knowledge shared experiences and understanding.

Online collaboration supports learners sharing and exchanging their ideas, beliefs, opinions, knowledge, and information with other learners online. Also, they can study with not only instructors, but also experts from any places in the world. Online collaboration supports the following:
1) Learners can interact with other learners from around the World
a. asynchronous communication (email, Listservs, etc.) allows for time-independent interaction among learners,
b. synchronous communication (teleconference, etc.) allows for live interaction among learners,
c. learners have the freedom to move outside their environments to interact other learners from other places, and
2) Learners can interact with instructors and experts from around the world
a. asynchronous communication (email, Listservs, etc.) allows for time-independent interaction between learners and instructors-experts,
b. synchronous communication (computer conferencing, bulletin board etc.) allows for live interaction between learners and instructors-experts
c. online learning provides experts from various fields,
d. online learning provides a variety of perspectives from learners to outside experts and guest lecturers,
e. instructors and experts provide support, feedback, and guidance to learners, and
f. learners communicate individual authors', editors', or instructors' points of views.

Online synchronous model is closely related to the regular habits, experiences, and expectations of instructors. These online interactions take place in real time. For example, interactive video conferencing is a synchronous conference. The Web supports online asynchronous instructional activities. Asynchronous learning can be defined as learning any time and in any place by using the Web and its tools, such as email, computer conferencing, and bulletin board, etc. In particular, asynchronous online courses eliminate direct lecture transmissions, and also require instructors to develop different ways of supporting, evaluating and engaging learners. Asynchronous online communication allows learners to contribute at their most convenient time, and encourages them to analyze and reflect their discussions of the discussion topic.

Online group deliberation in asynchronous learning can be best conducted through spoken discourse and interpersonal interaction rather than mediated conversations. Online interaction and communication tend to be longer than face-to-face situations with more information from many resources, so participants should be more attentive to the who and what of a discussion. There are many benefits to online electronic collaboration vs. face-to-face ones (Khan, 1997): 1) discussions are focused and organized, 2) learners have time to think and develop ideas before entering comments, 3) as an individual, learners can join the discussion any time, even after the discussion started; and 4) learners can view how ideas and directions are previously developed. In face-to-face meetings, fewer learners can participate, because instructors have limited time for meetings.

Another aspect of online discussions is the loss of visual clues during discussions that can be problematic in asynchronous communications. Berge (1997) supports written communication in asynchronous learning, because it tends to be more reflective than spoken interaction. He also highlights that nonverbal cues, such as body language, mimics, etc., and other social context cues associated with face-to-face conversation are missing in text-based email conversations. Thus, written communication allows learners to focus on the content of the message rather than the presenter.

The roles of online instructor are being a facilitator and a guide through a collaborative learning process. Online instructor must provide motivation, organization, and mediation in online learning activities. According to Hiltz (1997), online teachers must deliver information by merging active participation and interaction. Therefore, their roles have become more supportive and less instructional. However, online instructor must understand the basic components of online learning to become active participants in electronic environments (Khan, 1997).

Online instructor must become facilitators of online instruction. For this reason, learners in online milieu must understand their as active contributors of instruction, and instructor roles as a facilitator. As a result, online learners must be trained on how to initiate or practice good online learning techniques. Lumpkings, Pippen and Parker (1997) point out that two or more learners can meet at a common location and collaboratively work on assigned activities, conference with the instructor, school personnel at distant sites and other student via the Web. Information exchanges and data transfers may occur from any combination of learners, resource, experts and/or instructors during these sessions. Experts and educators, furthermore, from all over the world become collaborators with learners and teachers in the classroom. The communication with experts and more capable peers online leads to learners' intellectual growth. A well-designed online model must provide virtual environments in which learners represent and share knowledge with experts.

Saunders (1989) describes a range of online interaction combined with the assigned tasks and suggested four primary categories for describing collaborative projects: 1) cowriting, collaboration on all steps of the writing process, 2) copublish, working together as a team to develop a collective document by sharing ownership and responsibility for the collective document, 3) corresponding, planning and composing individually in which student do not share ownership, and 4) coediting, collaborating to proofread and correct mechanical, content, and meaning errors.

Bonk, Medury and Reynolds (1994) categorizes computer conferencing and the taxonomy of collaborative writing into five levels: 1) Email and delayed messaging tools allowing learners to directly send messages from one computer to another, 2) remote access and delayed collaboration allowing learners regardless of time and space to remotely access, update and control messages, 3) real time brainstorming and conversation encouraging multiple users to simultaneously brainstorm on a topic through electronic messaging, 4) real-time text collaboration permits two or more learners to enact text-related changes on a document at the same time, and 5) real-time multimedia and/or hypermedia

collaboration fostering document sharing capabilities including video, music, and graphics, etc. Their study documented different levels of collaborative educational learning tools associated with social interactions and human learning.

The most common online tools for online learning collaboration including both asynchronous and synchronous communication are electronic mail, computer conferencing and bulletin board.

Electronic Mail (E-mail)

Most email studies were done in the early 1990's. After 1995, the majority of studies have shifted web-based computer conferencing. Electronic mail, commonly known as email, is another method of online collaboration. Unlike face-to-face conversations, email does not require participants to respond immediately. As a result, interactions seem to be more concise, so learners can post more thoughtful response and creative conversations. When learners engage in the experience of using email, they can improve their ability of writing and reading beyond the benefits communicating with others from the world.

A study by Cifuentes and Shih (1999) using American and Taiwan learners indicated that email was for more effective than synchronous communication for learning across a number of time zones. Online learners and instructors use email for their learning and teaching objectives. Online educators, also, can build a powerful relationship with learners by simply spending a few minutes each day to communicate with their learners via email.

Harasim and her colloquies (1997) examined twelve learners and faculty in the Instructional System Technology (IST) department at Indiana University. The participants in this study indicated that there was a cost and time efficiency benefit to use email for learning activities. However, a deluge of email was the problem in the learning setting. Email communication might resolve some communication problems, but it could also cause some new ones. Overload of messages could be a real problem for online instructors. Black and his colloquies (1997) discussed the learning issues involved when setting computer literacy objectives for graduate learners in education. He found that learners did not like having a computer use requirement, nor did they like peer collaboration with email because of lack of virtual clues. Finally, Black found that she was more involved the learners' individual projects than planned.

The use of email in online courses has some advantages: online discussion group work help learners understand the context better, online collaborative learning work provide learners a multi-dimensional view of point, and learners can easily define their scope of their own projects during online discussions. Online learners like reliable and quick delivery way of messages as well.

Sherry and Myers (1996) studied the group dynamics of collaborative learning team in their classrooms. Learners interacted with one another and with the team. Both face-to-face instruction and email communication were used during these interactions. There were two main findings in this study. First, team members began to develop expertise in their chosen areas. Also, their primary roles began to change. Second, the student roles shifted and peer mentoring became common. They provided resources and gave feedback to keep up the team 's energy. However, the learners successfully developed a collaborative project including reflection in action, building a common knowledge base, taking ownership of an authentic task, and generating research questions. An online instructor must be careful about two key points when using email as an instructional tool. Therefore, the deadlines for every task and process must be given to learners, and these tasks and process regularly should be monitored and reported to learners.

Using email as an instructional tool reduces document handling and fosters

communication. Online faculty can use email for answering direct questions from any learners, counseling, class assignments, general class announcements, occasional quizzes, direct communication with a particular student, posting grades, helpful hits about homework and assignments, and exercises for learners missing the class.

In summary, learners, instructors and schools can remotely collaborate with each other via email. Email communication has the following characteristics: 1) email is a speedy, informal and cost effective way to communicate with others from outside the class and school, 2) learners and instructor gain information that they may not have received through traditional communication channels, 3) using email can promote positive relationships between class and society, and 4) email may increase learners' and instructor' responsiveness to the larger groups. Learners and instructor can obtain first-hand information about each other via email communication.

Computer Conferencing

Computer conferencing is an asynchronous discussion, debate, and collaborative effort among a group of learners who share and exchange an interest in the specific topic (Jonassen, 1999). Web allows for hypertext and hypermedia settings to connect learners to the web-based network. Therefore, online learning can provide a more flexible and sophisticated environment extending the educational potential beyond the traditional text-only conferencing. Web-based computer conferencing creates online learning communities based on idea exchange, multiple perspectives and collegial interaction. Online projects, on the other hand, must involve one or two other classrooms to gain maximum cultural and regional diversity.

Computer conferencing allows communication anywhere any time in the World. Online conferencing emerges as a medium offering a wide range of interactivity for learners. In particular, computer conferencing supports high level interactive learning environments including learning strategies, methods and activities, such as student-instructor dialogue and collegial exchange, collaborative learning and knowledge sharing. Virtual classroom promotes interaction, which is usually lacking in the face-to-face classroom.

Online computer conferencing can create an effective online learning through participation, collaboration, and interaction in online learning communities. Additionally, web-based computer conferencing engages learners in wide range of discussion topics with peers, and allows learners to actively participate in these discussions (Bonk, Medury, & Reynolds, 1994). Online computer conferencing can help learners take benefit from multi-perspective views of ideas, solve their own instructional problems by sharing the solutions with other learners, and represent their own culture to each other.

Online computer conferencing creates online communities. However, the recent studies show that building these communities and effective online learning environments is difficult. Learners can feel isolated and disoriented when there is no face-to-face contact with other learners and instructors. Application of pedagogically appropriate educational theories and instructional strategies are the key points to build online communities via computer conferencing. To deliver online conferencing on the Web, some changes, such as both learner-centered and team-centered learning as well as experience-based and socially constructed knowledge in the traditional learning originations must be planned, implemented and evaluated by online institutions, instructors and learners.

Learners become active participants in online computer conferencing when the opportunity and encouragement are given. the following: democratic and egalitarian environment, reflective thinking, enhanced collaboration, and learners can learn much from others when they exchange ideas on a problem. However, there some reported limitations online conferencing: difficult group decision-making, disorientation and

navigation problems, limited knowledge sharing, and need for coherent organization and moderation.

Computer conferencing adds new dimensions to teaching and learning by promoting knowledge and understanding of diverse perspective. Online communication allows learners and instructors to link with other cultures and resources. For example, the Kansas middle school learners learned via this technology how to Alaska learners conducted community research, and also constructed a Web page to exchanges ideas and share knowledge with the world (Bonk & Kira, 1998). Online participants in an electronic discussion group work together, share success, increase their self-concept, and expand existing awareness. When working with each other collaboratively, learners can reflect on their experiences and problems. Consequently, online learners can fix the problems with their individual and collaborative solutions.

Jaffee (1998) mentioned that eight professors used electronic discussion groups as a part of their course work in the fall 1996. Ninety-six learners joined this research. The discussion list became an excellent tool to enhance communication skills in a natural environment. Learners improved the quality of their responses to the discussions, because they had enough time to think and process their ideas. Also, learners and instructor interacted with each other according to their time schedule; so electronic discussion groups provided convenient collaboration among them.

The use of electronic discussion has many benefits over the traditional classroom discussion. Some learners are impulsive learners who have the need to respond to every question. Also, they have the urge to make a comment on everything discussed in class. Others are reflective learners who need more time to process the question before answering. Electronic discussion groups provide equal opportunity for learners to participate. The main goal of computer conferencing is to provide a flexible framework to support advanced pedagogies associated with principles of active learning, collaboration, multiple perspective and knowledge building.

Bulletin Board

Asynchronous learning provides a learning environment at anytime and any place. The Bulletin Board is one of the most common asynchronous communication tools having multiple dimensions empowering learners to participate in and pursue online discussion. Bulletin boards enable instructors and learners to post ideas, thoughts, exercises, feedback, assignments, commends, and/or papers in a public forum. From the pedagogical point of view, forcing learners to write is the best part of the bulletin board system. Merron (1998) taught a course entitled Literary Journalism entirely online. By the end of seven-week course, the researcher got more than 700 postings from sixteen learners. Some of these postings were off subject, but most postings were substantive comments, feedback and questions about the subject matter. Merron (1998) mentions that must be the most motivating points of online learning setting.

The majority of learners are used to learning with face-to-face settings by focusing on a linear and single discussion topic. However, online learners must adjust themselves to the non-linear nature of asynchronous learning. This learners, also, can be encouraged to submit their comments, suggestions and/or feedback on the online board to the instructor and others learners. Picciono's study (1998) evaluated learners learning experiences with instructional design components of an asynchronous course at a large urban university. The findings have shown that reading and writing substantive Listserv postings took more time than the normal exchanges in a traditional class. Some learners preferred having the time to develop their thoughts before expressing themselves.

Not only is the level of online learner involvement in the use of an online bulletin board (OBB) crucial, but also the satisfactions of online participants with the use of this medium

are essential in virtual milieu. Online learners can be excited communicating with others via OBB; because they can work on new kinds of resources by obtaining new experiences fitted to their needs. The majority of online learners, also, can handle the obstacles even though they have little previous experiences, and join the electronic communities to share their thoughts and ideas on the Web. Consequently, these online participants can realize that OBB allow them to become actively engaged in an online community to share and create information. Online learners can improve their own professional learning activities, and develop their competence in the content area when more participation is supported on OBB.

Online learners in virtual environment can be involved in the class discussions in a short time after enrolling the course. These learners, also, bring different levels of skills and confidence to online learning. More mature learners are self-directed and willing to take on responsibility for their learning (Kurubacak, 2000). Online learners, on the other hand, need to know how to sift the OBB discussions for misinformation. In asynchronous communication, instructors cannot instantaneously correct or clarify a comment, but the amount of student participation in online learning can increase the number of comments.

Gamas and Solberg (1997) examined the use of electronic collaborations tools supporting student interpersonal communication and facilitating learning activities within five university courses. Participants in this study collaborated on sixteen discussion questions across seven classes, and also generated four hundred seventy entries into discussions forums. Online discussions generated activity throughout the semester. Also, they linked the prior learners to current learners in peer mentoring online learning settings. Learners and instructors shared information and online resources, and also examined these links from discussion forum messages. Learners in this research reported a great comfort level with other learners after working on online discussion forums. They also mentioned that there was a close link between the use of email and discussion forums providing the positive nature of communication.

Online conferencing implemented via email, computer conferencing or bulletin board have some common benefits given the following: 1) academically low or shy learners can have a chance to participate the discussion, 2) learners obtain permanent discussion records, 3) learners can obtain first-hand information about the discussion, 4) learners can join the discussion any time, and 5) learners can learn from other learners from an other culture. However, it is important that the instructor always mentors the discussion, because some learners prefer being silent or seldom participate in the online environment. Additionally, there can be many technological problems, so the virtual classroom cannot run efficiently.

Conclusion

The use of an online model for designing and delivering courses in academic settings is increasing rapidly and has become an important topic studied. However, not only is this model a tool to improve online teaching and learning, but also how the instructors integrate online tools and online activities into curriculum. An essential step in productively integrating online model is to start with an explicit definition of the roles of online instructors and learners. Furthermore, an online model for designing and delivering courses on the Web improves online learning and teaching for on-campus and off-campus learners to integrate online learning materials into curriculum, and access wide information data sources and experts as well as nonstop interaction with instructors and peers.

References

Alexander, P. A. & Murphy, P. K. (1994). The research base for APA's learner-centered

psychological principles. Papers presented at the American Educational Research Association Annual Meeting, New Orleans.

Bannan, B. & Milheim, W. D. (1997). Design of existing web-based instruction courses. In B. Khan, (Ed.), Web-Based Instruction (pp.381-387). Englewood Cliffs, NJ: Educational Technology Publications.

Berge, Z. (1997). Characteristics of online teaching in post-secondary, formal education. Educational Technology, 37(3), 35-47.

Beyer, B. K. (1998). Developing a thinking skills program. Boston: Ally and Bacon.

Black, L., Klingenstein, K. & Songer, N. B. (1997). Observations from the Boulder Valley Internet Project. T.H.E. Journal, 22(10), 75-80.

Bonham, G. M. & Seifert, J. W. (1999). The disruptive and transformative potential of hypertext in the classroom: Implications for active learning. Paper delivered at the 40th Annual Convention of International Studies Associations, Active Learning in International Affair Section, Washington, DC: (http://web.maxwell.syr.edu/ir/isa99.htm).

Bonk C. J. (1999). Online learning. Paper presented at the Teaching Online Workshop, Cincinnati, OH.

Bonk, K. J., Appelman, R. & Hay, K. E. (1996). Electronic conferencing for students' apprentices for students' apprentice perspective. Educational Technology, 36 (5), 8-18.

Bonk, K. J. & Cummings, D. J. (1998). Searching for learner-centered, constructivist, and sociocultural components of collaborative educational learning tools. In K. J. Bonk & K. S. King (Eds.), Electronic Collaborators: Learner Centered Technologies for Literacy, Apprenticeship, and Discourse (pp. 25-50). Mahwah, NJ: Lawrence Erlbaum Associates, Inc., Publishers.

Bonk, C.J., Medury, P. V. & Reynolds, T. H. (1994). Cooperative hypermedia: The marriage of collaborative writing and mediated environments. Computers in the Schools, 10(1-2), 79-124.

Bonk, C. J. & Reynolds, T. H. (1997). Learner-centered web instruction for higher-order thinking, team working, and apprenticeship. In B. H. Khan, (Ed.), Web-Based Instruction (pp.167-178). Englewood Cliffs, NJ: Educational Technology Publications.

Bonk, K. J. & King K. (1998). (Ed.) Electronic collaborators: Learner-centered Technologies for Literacy, Apprenticeship, and Discourse. Mahwah, NJ: Lawrence Erlbaum Associates. Bostock, S. J. (1997). A critical review of Laurillard's classifications of educational media. Instructional Science, 24, 71-88.

Cifuentes, E. & Shih, T. (1999). Preparation for online teaching. Paper presented at the AECT Conference, Huston, TX.

Dillion, A. & Zhu, E. (1997). Designing web-based instruction: a human-computer interaction perspective. In B. H. Khan (Ed.), Web-Based Instruction (pp. 221-224). Englewood Cliffs, NJ: Educational Technology Publications.

Dyrli, O. E. & Kinnaman D. E. (1996). Part 4: Connecting with the world through successful telecommunications projects. Technology and Learning, 16 (7), 56-61.

Farr, R. & Tone, B. (1994). Portfolio and performance assessment: Helping students evaluate their progress as readers and writers. Forth Worth, TX: Harcourt Brace College

Publishers.

Gamas, W. & Solberg, B. (1997). Classroom collaboration in cyberspace. (http://www.coe.uh.edu/insite/elec_pub/HTML1997/de_gama.htm).

Gunawardena, C. N., & Zittle R. (1995). An examination of teaching and learning process in distanc education and implications for designing instruction. In M. Beaudoin (Ed.), Distance Education Symposium 3: Instruction (pp. 51-63). University Park, PA: The Pennsylvania State University.

Hackbarth, S. (1997). Web-based learning activities for children. In B. H. Khan (Ed.), Web-Based Instruction (pp. 191-212). Englewood Cliffs, NJ: Educational Technology Publications.
Halpen, F. D. (1984). Taught and knowledge: An introduction to critical thinking. New Jersey: Lawrence Erlbaum Associates.

Harasim, L. (1993). Collaborating in cyberspace: Using computer conferences as a group-learning environment. Interactive Learning Environments, 3(2), 119-130.

Harasim, L., Hiltz, S. R., Teles, L. & Turoff, M. (1995). Learning Networks: A field guide to teaching and learning online. Cambridge, MA: MIT Press.

Harasim, L., Calvert, T. & Groeneboer, C. (1997). Virtual-U: A web-based system to support collaborative learning. In B. H. Khan, (Ed.), Web-Based Instruction (pp. 149-158). Englewood Cliffs, NJ: Educational Technology Publications.

Hiltz, S. R. (1997). Impacts of college level courses via asynchronous learning networks: Some preliminary results. Journal of Asynchronous Learning Network, (2), 1-9.

Jaffee, D. (1998). Institutionalized resistance to asynchronous learning networks. Journal of Asynchronous Learning Networks, 2 (2), 21-32.

Jonassen, D. J. (1999). Computer in the classroom mindtools for critical thinking. Second Edition. New Jersey: Prentice Hall.

Khan, B. H. (1997). Web-Based Instruction. Englewood Cliffs, NJ: Educational Technology Publications.

Khan, B. H. & Vega, R. (1997). Factors to consider when evaluating a web-based instruction course: A survey. In B. H. Khan (Ed.), Web-Based Instruction (pp. 375-380). Englewood Cliffs, NJ: Educational Technology Publications.

Khan, B. H. (2000). Web-based learning. (http://bookstoread.com/bestseller/khan/wbl.html).
KIDLINK (2000). http://www.kidlink.org.

Kirkley, S. & Bolling, E. (1995). Learner-centered design: Software for the Information Age (http:/www.indiana.edu/~iirg/ARTICLES/AAIM/lcd.html).

Koschmann, J. & et al. (1994). Using technology to assist in realizing effective learning and instruction: A principled approach to the use of computers in collaborative learning. Journal of the Learning Science 3(3), 227-264.

Kurubacak, G. (2000). Online Learning: A Study of Students Attitudes towards Web-Based Instruction (ONLINE LEARNING). Unpublished doctorate dissertation. Cincinnati, OH.

Kurubacak, G. & Gonzales, C. (2002). The Use of the Internet as an Enhanced Critical

Thinking Tool. Society for Information Technology and Teacher Education 2002 International Conference Proceedings. Nashville, TN.

Lumpkings, B., Pippen, F. & Parker, F. (1997). Collaborative distance learning (CDL): An instructional model designed to enrich teacher education courses. (http://www.coe.uh.edu/~coe911/HTML1997/de_lump.htm).

Martindale, J. & Ahern, S. Z. (1998). Utilizing Technology in educational research: Implementation with graduate students. Paper presented at the AECT Conference, Huston, TX.

Mendels, P. (1998). Grant program accepting proposals for learning technologies. New York Times. Retrieved June 25, 1998 from the World Wide Web http://www.nytimes.com/library/cyber/week/021498education.html.

Merron, J. L. (1998). Managing a web-based literature courses for undergraduates. (http://www.westga.edu/~distance/merron14.html).

Mory E. H., Gambill, L. E. & Browing, J. B. (1998). Instruction on the web: The online student's perspective. Paper presented at the AAEC Conference. (http://www.coe.uh.edu/insite/elec_pub/HTML1998).

NASA Sea WIFS Projects (2000) (http://seawifs.gsfc.nasa.gov/_SEAWIFS.html).

Pea, R. (1994). Seeing what we build together: Distributed multimedia-learning environments for transformative communications. Journal of Learning Sciences, 3(3), 285-299.

Picciono, A. G. (1998). Developing an asynchronous course model at a large urban university. Journal of Asynchronous Learning Networks 2 (1), 1-14.

Rebelsky, J. A. (1999). A web of resources for introductory computer science. (http://www.ncsa.edu/SDG/IT94?/Proceedings/Educ/rebelsky)

Relan, B. & Gillami, A. (1997). Incorporating interactivity and multimedia into web-based instruction. In B. H. Khan (Ed.), Web-Based Instruction (pp.231-237). Englewood Cliffs, NJ: Educational Technology Publications.

Reeves, T. C. & Reeves, P. (1997). Effective dimensions of interactive leaning on the world wide web. In B. H. Khan (Ed.), Web-Based Instruction (pp.59-66). Englewood Cliffs, NJ: Educational Technology Publications.

Sanders, J. (1997). Enchaining classroom interaction in distance education utilizing the world wide web. (ERIC Document Reproduction Service No. ED353452).

Savery, J. R. & Duffy, T. M. (1996). Problem-based learning: an instructional model and its constructivist framework. In B. G. Wilson (Ed.), Constructivist Learning Environments: Case Studies in Instructional Design (pp. 135-148). Englewood Cliffs, NJ: Educational Technology Publishing.

Schutte, J. G. (1996). Virtual teaching in higher education: Is the new intellectual superhighway or just another traffic jam. (http://www.csun.edu/sociology/vivexp.htm).

Sherry, L. (1996). Issues in distance learning. International Journal of Distance Education, 1 (4), 337-365.

Sherry, L. & Myers, K. M. M. (1996). Development research on collaborative design. Paper

presented at the 43rd Annual Conference of the Society for Technological Communication (pp.199-204). Arlington, VA: society for Technological Communication.

Sherry, L. & Wilson, B. (1997). Transformative communication as a stimulus to web innovations. In B. H. Khan (Ed.) Web-Based Instruction (pp. 67-73). Englewood Cliffs, NJ: Educational Technology Publications.

Soloway, E. & et al. (1991). Motivating project-based learning sustain the doing, supporting the learning. Educational Psychologist, 26, 369-398.

Soloway, E., Guzdial, M., & Hay, K. (1994). The challenge for HCI in the 21st century. Interactions, 1(2), 36-48.

Tolley, H. J. (1998). Teaching human rights on-line: cases for critical thinking and cross-cultural communication. (http://oz.uc.edu/thro/index.html).

Vygotsky, L.S. (1986). Mind in society. Cambridge, MA: MIT Press.
Zhu, E. & Vazquez-Montilla, J. (1999). Web-based distance learning: A case of using systems approach to design and deliver a cross-cultural communication course. Paper presented at the AECT Conference, Huston, TX.
