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The rapid growth of Web-based instruction has raised many questions about the quality of online courses. This chapter presents a conceptual framework that can guide the development of online courses by providing a holistic perspective on online teaching and learning. Examples of instructional strategies that fit the framework are described.

An Instructional Strategy Framework for Online Learning Environments

Scott D. Johnson, Steven R. Aragon

Distance education is an instructional delivery system that allows students to participate in an educational opportunity without being physically present in the same location as the instructor. Although print-based correspondence study is the traditional method of distance education, more contemporary approaches rely heavily on various forms of instructional technology (Garrison, 1987).

The reason for much of the growth in distance education programs in recent years is the development of the Internet and improvement of technologies that support online learning environments. For example, among higher education institutions offering distance education, use of two-way interactive video and one-way prerecorded video was essentially the same in 1997–98 as in 1995, whereas the use of asynchronous Internet-based technologies nearly tripled in that same time period (Lewis, Snow, Farris, Levin, and Greene, 1999), and 88 percent of higher education institutions now plan to use Internet courses as their primary mode of instructional delivery for distance education (Waits, Lewis, and Greene, 2003). This change is not new to the distance education community, which has seen technology-based educational innovations come and go with much fanfare. The instructional films of the 1940s were expected to radically change the educational delivery system, as were instructional radio and television. Although each of these technology innovations had some impact on educational programs, they did little to change the fundamental nature of education itself. The Internet and computer technology, as the next generation of technological innovation to affect distance education, appears to have the power to significantly alter the education landscape.

In spite of the rapid growth in its use, there is considerable concern about the effectiveness of computer technology in education. Numerous studies comparing traditional classroom-based instruction with technology-supported instruction have found no significant differences in critical educational variables such as learning outcomes and student satisfaction (Clarke, 1999; Johnson, Aragon, Shaik, and Palma-Rivas, 2000; Navarro and Shoemaker, 1999; Smeaton and Keogh, 1999). A comprehensive book (Russell, 1999) and an up-to-date Web site (http://teleeducation.nb.ca/nosignificantdifference) contain a listing of over three hundred research reports, summaries, and papers on the effectiveness of technology-mediated distance learning. This comprehensive bibliography spans seven decades and highlights studies that reveal little or no significant impact of instructional technology on various educational variables.

The obvious conclusion from many studies in this field is that the technology used to support instruction has little impact on students' attainment of educational outcomes. The primary factor in any instructional initiative, regardless of format or venue, is the quality of the instructional design that is ultimately implemented. Based on the lack of evidence that technology significantly influences the learning process, scholars in the field of instructional technology now conclude that the technology used in an online program is not as important as other instructional factors, such as pedagogy and course design (Phipps and Merisotis, 1999). This is not a new idea, however, as Schramm stated in 1977: "Learning seems to be affected more by what is delivered than by the delivery medium" (p. 273).

This chapter describes a research and development effort that evolved during the creation of an HRD (human resource development) graduate program called HRE Online that was taught entirely online. The learning environment that was created to support HRE Online was based on the assumption that learning is a complex event that cannot be explained with a single theory of learning. Instead, we hypothesized that quality learning environments should be based on instructional principles that are derived from multiple learning theories. Through an analysis of existing literature and experienced-based practices throughout the development of HRE Online, we identified a set of instructional principles for online learning environments that are derived from a fusion of multiple theories of learning. Using these instructional principles as a framework, we then developed specific instructional strategies or techniques to be applied in an online learning environment.

Instructional Challenges for Online Course Designers

Innovations in instructional technology are often implemented in very traditional ways. For example, while television had the potential to significantly alter the way people were educated, its use as an instructional tool built on an existing instructional paradigm by providing a "talking head"

that merely passed information to the student. Using this innovation in this way lacked creativity and ignored the power of the technology.

The same problem now seems to be occurring in online instruction. Instructional designers are creating online courses that are simple conversions of their equivalent face-to-face counterparts. Although educational innovations such as active learning, collaborative learning, project-based teaching, and situation learning have changed the nature of face-to-face instruction, online courses tend to build on very traditional views of learning. Often the primary goal of an online course is to transfer information from the instructor to the student by providing students with access to information and expecting them to demonstrate their learning on an exam. Examples of traditional forms of face-to-face instruction that have been converted for online delivery include recorded lectures, online readings, homework assignments, and online tests.

The growth of online instructional programs raises an interesting question for online course developers. Should online course designs follow the "traditional" models of instruction, or should innovative approaches be incorporated into online programs? If the answer is to design online courses that go beyond instruction as an information delivery system, the challenge for Web-based course developers becomes clear. Instructional designers need to look for innovative ways to support quality teaching and learning without succumbing to the temptation to have online instruction become direct instantiations of traditional forms of instruction. The challenge for instructional designers is to devise ways to incorporate the most effective and innovative instructional strategies in courses delivered over the Internet.

Instructional Principles for Online Learning Environments

In order to meet this challenge, instructional designers must examine their traditional perspectives and adopt a philosophy of teaching and learning that is appropriate for online instruction. This does not imply that traditional learning theories such as behaviorism should be tossed aside in favor of the more contemporary social-constructionist theories. Instructional designers need to match their desired learning goals and instructional methods to the appropriate learning theories. We argue that this new philosophy should build on a combination of learning theories rather than be confined to one preferred perspective (Johnson, 1997). For example, quality online learning environments should be made up of elements of behavioral learning theory (for example, using positive reinforcement and repetition), cognitive learning theory (for example, addressing multiple senses, presenting new information in motivating ways, limiting the amount of information presented, and connecting new information to prior knowledge), and social learning theory (for example, encouraging group interaction, peer assessment, and personal feedback). Adopting a synthe-

sized theory of learning can have a synergistic result by integrating the most positive and powerful aspects of each individual learning theory into an online learning environment.

Specific aspects of adult learning theory guided the development of the pedagogical model that was used to develop the HRE Online master's degree program (Bandura, 1971; Cross, 1981; Knowles, 1984; Merriam and Caffarella, 1999; Vygotsky, 1978). Two conceptual models that were developed from an extensive study of the literature were reviewed. These two models were then synthesized into seven general principles that appear to be critical for quality learning environments (Johnson and Thomas, 1992; Johnson, 1997). We contend that powerful online learning environments need to contain a combination of these principles: (1) address individual differences, (2) motivate the student, (3) avoid information overload, (4) create a real-life context, (5) encourage social interaction, (6) provide hands-on activities, and (7) encourage student reflection (see Figure 3.1). This peda-

Figure 3.1. An Instructional Strategy Framework for Online Learning Environments
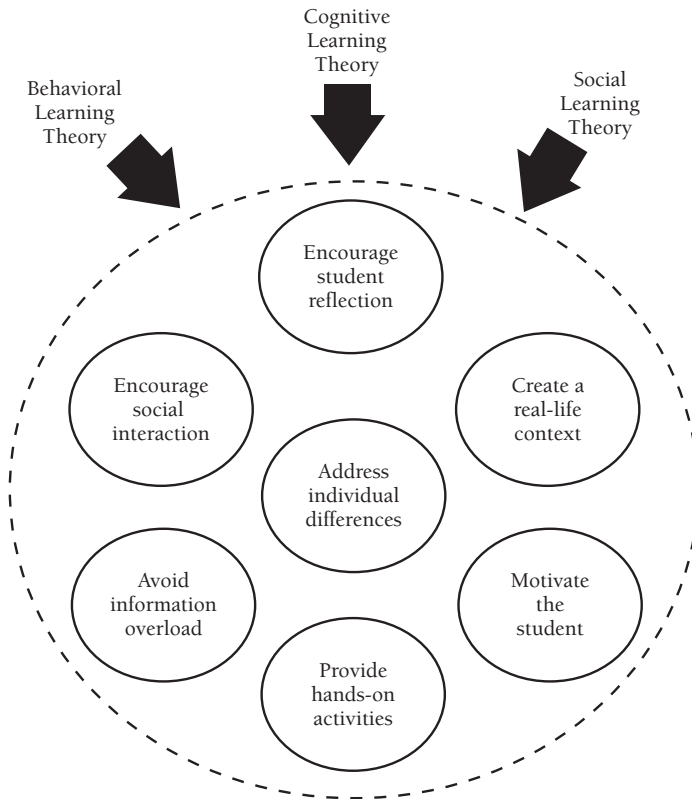
gogical model for online instruction was used to create the design template that is followed for each course in the HRE Online program.

The next section provides specific examples of instructional strategies that have been used in the HRE Online program. Each of these strategies highlights the importance and practical application of the seven principles of quality online learning environments.

Individual Differences. Differences among students within a learning context can be found in the areas of general skills, aptitude, information processing, and application of information to new situations. In addition, all learners differ in their ability to perform various education-based and real-world learning tasks. Consequently, the general abilities or preferences of the learner will affect his or her ability to achieve different learning outcomes. Individual differences specific to learning and instruction can be found in intelligence, cognitive controls, cognitive styles, learning styles, personality types, and prior knowledge (Jonassen and Grabowski, 1993). Recognition of individual differences has, for the most part, been taken into account and promoted through the instructional design template used in HRE Online. The following techniques and strategies have been used in our online courses to address individual differences.

Provide Content in Multiple Formats. This is done through the use of various communication technologies. Lectures are audiostreamed and synchronized with the applicable PowerPoint presentation. These lectures are also transcribed and posted in the course Web site, which is beneficial for students who travel and want to take the transcribed lecture with them to read. Content is also presented through WebBoard discussion groups, where students are required to share and discuss information with each other. Each course also has links to outside Web sites that provide supplemental material on the current topic.

Allow for Individual Locus of Control. All courses provide various means of navigation within the online course. Content can be accessed through links or a graphical organizer. Individuals can be as systematic or random in accessing course material as they desire. Although the course is built and presented in a hierarchical sequence, it does not have to be accessed in the same way, and students may even move through the course topics in random order.

Encourage Active and Collaborative Interaction. In light of the idea that the whole is greater than the sum of its parts, each course is designed with activities that are both individual- and group-based. Working within "virtual teams," students work together to solve problems, analyze cases, and develop group deliverables. These assignments allow individual ideas, perspectives, and experiences to be heard and collectively considered. The idea of "agreeing to disagree" is taught through these experiences.

Motivation. Motivation, in terms of student attention, relevance of content, confidence in one's ability to learn, and satisfaction with the learning experience are critical aspects of a learning environment (Keller and Suzuki,

1988). Instructors must be able to gain and maintain students' attention by providing an environment that is engaging and participative. Although keeping students' attention is critical, that attention cannot be maintained unless the students feel that the course material is relevant. In other words, the course content, activities, and assignments must be related to students' personal and professional goals. Students must also feel confident that they can be successful in the course and satisfied with their experience.

Strategies for enhancing student motivation in a Web-based environment can best be characterized as either novel and entertaining approaches or attempts to personalize the instruction. We have successfully used the following techniques to enhance the motivation of our online students.

Incorporate Games into the Online Environment. An example of a successful game for an online course is the popular television show "Who Wants to Be a Millionaire?" We have used this game during live synchronous sessions to summarize course content covered previously and to provide a sense of community among the students. The instructor plays the role of Regis Philbin, the game show host, and reads a question that requires the students to put a sequence of answers in the correct order. The students then type the correct order (for example, B, C, D, A) as quickly as they can into a WebBoard chat window. The student who first answers correctly becomes the contestant who calls a toll-free number so his or her voice can be patched through to the class. This provides live dialogue when the instructor asks a student the first of several multiple-choice questions. The student has the option of answering the question directly or, if unsure of the answer, can use one of two "lifelines." The lifeline "Ask the Audience" involves asking all students to post what they think is the correct answer in the chat space. The contestant can then use their colleagues' responses to select the correct answer. The contestant can also "Phone a Friend" by asking one particular student for help and then may respond by typing the answers in the chat space. The game continues until the student answers a predetermined number of questions correctly or responds with an incorrect answer. When this happens, another sequencing question is asked so another contestant can be selected.

Simulate a Radio Talk Show with Multiple DJs and "Call-In" Guests. In many online courses, the students spend much of the "class time" listening to the instructor through streaming audio or video technologies or in a live "Web cast" during a synchronous class session. As we all know, it can be both boring and difficult to listen to one voice for any length of time, especially when there are few visual cues to accompany the audio. To provide variety and a livelier online atmosphere, we have been successful having multiple speakers interact during these broadcasts to liven up the synchronous sessions.

Use Multimedia When Appropriate. Online courses tend to be primarily text-based forms of instruction. Although this may be preferable to some students, we must recognize that the students of today are different from

those of the past. The MTV generation seems to prefer visual over verbal stimulation, and there is no excuse for not incorporating multimedia into technology-based learning systems. We have found that graphic images, photographs, and videos enhance student motivation. For example, in several of our courses we have created short QuickTime clips from popular movies and television shows that can be streamed over the Web. These clips provide entertaining examples that support the concepts and procedures being discussed in class and provide a nice break from the textual format that dominates current online environments.

Information Overload. Providing too much information in a short period of time contributes to memory overload, which makes learning difficult and leads to confusion and poor retention. Psychological studies show that most people can manage about seven "pieces" of information at one time without too much difficulty (Miller, 1956). Providing more than that amount of information at one time overloads short-term memory. Instructional designers need to follow the Rule of Seven, which suggests that the amount of information presented at one time should be limited to no more than seven pieces of content (Clement, 1985). The Rule of Seven suggests that instructional designers "chunk" instructional content into small groups and give students the opportunity to learn each "chunk" thoroughly before being presented with new information. Using this strategy will result in better understanding.

The following strategies have been used successfully in our online program.

Limit the Amount of Content and Number of Activities. By following the Rule of Seven, we help avoid memory overload by purposely limiting the amount of information and activities we provide in a course. For example, we ask instructors to break their lectures into ten- to twelve-minute "chunks" or segments. These short lectures are recorded and converted into streaming media for delivery to students. The shortness of the lectures makes it easier for students to absorb them in one sitting and forces the instructor to concentrate on only a few main concepts in each "mini" lecture. This approach also fits ideally with the concept of a learning cycle.

Organize Instruction Around Learning Cycles. The instructional design model for the HRE Online program uses learning cycles at the core of its modular approach. Each course has a hierarchical structure containing sections, modules, and learning cycles. This approach allows for easy updating of courses over time and the development of custom courses to meet different client-group needs. More important, this instructional design approach builds on theories of adult learning.

Each learning cycle is made up of three components. The first component provides the student with access to new content through a streamed audio or video file or by reading an online article. The last component of the learning cycle involves evaluating the learning outcomes through an activity involving self-assessment, peer assessment, or formal instructor assessment and feedback. Once the learning cycle is completed, a new cycle

begins with the presentation of a new chunk of content, followed by new application and assessment activities.

Provide a Graphic Organizer for the Course. It is easy for students to get lost in any hypertext environment as they navigate through online courses that contain extensive layers of content distributed over multiple locations. To avoid the frustration and memory overload that can occur in a Web-based environment, we provide a visual representation of the course structure. This graphic organizer serves as a map for students as they navigate through various portions of the course. The graphic is also hyperlinked so students can move quickly to a desired location in the course by clicking directly on the image.

Contextual Learning. Context is an essential central element in learning because knowledge is a product of the activity, context, and culture in which it is developed and used (Brown, Collins, and Duguid, 1989). Wilson (1993) identifies three major premises of context and how these affect knowing and learning. The first is the idea that learning and thinking are social activities that are structured by constant interpersonal interaction. Second, the available tools within the particular situation significantly guide an individual's ability to think and learn. Third, human thinking is supported by interaction with the environment.

We offer the following recommendations to online instructors to promote contextual learning in the virtual classroom.

Create Virtual Learning Teams. At the start of each new course, students are placed in a virtual learning team consisting of three to four other classmates. This allows the instructor to replicate the group experience found in face-to-face settings. Students work together on weekly assignments and projects via conferencing systems, conference calls, e-mail, and instant messaging. This initiative provides a group context that is similar to what would be experienced in the face-to-face classroom.

Simulate Reality Using Appropriate Case Studies. Regardless of the delivery format, the more real-life examples that can be used, the better students will learn. Case studies are an excellent way to provide the context through which new learning can be developed. As with any situation when a case study is used, it is critical to choose cases that relate to the content of the course. In our online evaluation course, students are provided with a case describing a program in an organization that needs to be evaluated for effectiveness. Throughout the duration of the course, students are asked to design an evaluation around this case using the concepts, ideas, and procedures taken from the course materials. Students are provided with feedback through WebBoard discussions and weekly synchronous chat sessions.

Require Collaborative Projects with Schools, Businesses, or Other Organizations. Students are encouraged, when possible and appropriate, to develop course projects within the context of their work environment. This provides a real-life context in which to imbed application of the material. For example, in the online instructional design course, students develop a training package that represents six to eight hours of training time. The

majority of the students choose to develop a training package that addresses a performance issue within their organization.

Social Learning. Social learning theory combines elements from both behaviorist and cognitive theories and posits that we learn best by interacting with others in social settings (Merriam and Caffarella, 1999). Behavioral learning theory contributes to social learning because people do not learn from observation alone but through imitation and reinforcement of what they observe. Cognitive theory focuses on the cognitive processes involved in the observation over the resulting behavior, with the idea that individuals can regulate their own behavior by recognizing consequences. Social learning is manifested through socialization, social roles, mentoring, and locus of learning. Instructors and peers serve as a model for new roles and behaviors within an educational context.

Online faculty have used the following strategies successfully to promote this perspective.

Create a Personal Connection with Students. The goal is for the instructor to be perceived as a real person in mediated communication. This perception is promoted several ways. Each course has an audiostreamed welcome message from the faculty member, which helps the student put a face with the voice. In addition, using humor and vocal variety, personalizing examples, addressing students by name, questioning, praising, initiating discussion, and encouraging feedback all help make this connection. Personal connection can also be made through the use of "relational icons" or "emoticons" made by combinations of punctuation marks.

Peer Review and Feedback. Feedback from fellow students is as important as instructor feedback. Therefore, students in many online classes are asked to provide a meta-evaluation of another student's work. The purpose of the activity is for students to help their peers by providing comments that help the person understand the areas that are clear and well done and the parts that need further development. This activity also models appropriate format for the particular assignment being developed.

Require and Facilitate Interaction. This may not seem like a new approach, but in the online environment it is easy for students to be passive, both in weekly assignments involving the group and during synchronous chat sessions. In addition to basing a percentage of the course grade on participation, other initiatives can be taken as well. One is to post an agenda of the upcoming week's synchronous session. This serves as an advanced organizer and allows students to come to class better prepared for interaction. Another technique is to post discussion questions prior to a synchronous session so students can think about the topic and be ready for a discussion. Throughout the week, students are required to review comments and ideas that have been posted by other students and respond to them in a virtual class discussion.

Two things are important to keep in mind. First, although the quantity of interactions is important (as measured by hits on the WebBoard), the

quality of interaction is what should be stressed. If not, it becomes too easy for students to fall into the trap of providing comments that add little or no value to the discussion. Second, it is important that the instructor model the expected type of interaction by providing quality comments to the discussion as well.

Active Learning. There seems to be an assumed separation between knowing and doing in education (Brown, Collins, and Duguid, 1989), whereby knowing is valued over doing, and mental activity is valued over physical activity. However, cognitive theorists have challenged this perspective because the activities through which learning occurs are inseparable from cognition. In order for online instruction to be successful, some form of learner activity must be included.

Active learning can occur in many forms in an online environment. Discovery learning, project-based learning, and cooperative learning are common techniques for engaging students in activities that involve considerable amounts of creativity, decision making, and problem solving. Each of these instructional approaches emphasizes the importance of learning from goal-driven and activity-based experience. Because these types of activities usually take time to complete, they provide for sustained thinking about specific problems over long periods of time.

The following are specific examples of how active learning can be applied in an online environment.

Organize Online Courses Around Projects. Because HRD is a constantly evolving, applied field of study, it is reasonable to design an online HRD course with a heavy emphasis on the application of the skills and procedures needed by the HRD professional. The best way to accomplish this in an online environment is through a project-based approach. Application-rich courses can be designed around major projects and specific activities to be completed in order to create a final product. For example, in the instructional design course where students are expected to create a complete training module, they complete many tasks, such as conducting a needs assessment, developing training plans, and creating instructional media. By adopting a project-based approach, the online instructor can easily incorporate the concept of active learning into a virtual environment instead of providing the typical "read and write" online course.

Think-Pair-Share in a Virtual Environment. Having online students work in groups of two or three within a virtual environment is a great way to keep students active and focused on their learning. Think-pair-share is an active learning technique used in many face-to-face classes but is rarely used in a virtual environment. The goal is to help students organize prior knowledge, brainstorm questions, or summarize, integrate, and apply new information. This strategy can be used in both synchronous and asynchronous situations.

Use Small-Group Discussions During Synchronous Sessions. Although

few online programs seem to rely on synchronous class sessions, they can provide powerful opportunities for student interaction. We conduct weekly synchronous sessions in our program in which the instructor performs a live audio broadcast to the students over the Web while the students interact with the instructor and other students in a group chat space. Although this in itself encourages active learning, incorporating small-group interactions into the large-group discussions further enhances it. This is accomplished by having the instructor describe a discussion activity to the class and then asking them to enter their private "virtual team" chat space to discuss and complete the assignment. A specific time is given when the students are expected to return to the class chat space and share the major points of their discussion with the rest of the class. Although this technique is commonly used in many face-to-face classes, it is a unique, yet underused strategy in an online learning environment.

Reflective Learning. Mezirow defines *learning* as "the process of making a new or revised interpretation of the meaning of an experience, which guides subsequent understanding, appreciation, and action" (1990, p. 1). This process of reexamining and revising one's understanding occurs through reflection, which allows one's ideas, understandings, and experiences to be reviewed and challenged (Preskill and Torres, 1999) and leads to a change in one's values, strategies, and assumptions. Through reflection, individuals can correct their misconceptions by revisiting their beliefs and challenging the nature of their knowledge. Watkins and Marsick (1993) see reflection as a key to continuous learning.

The following three strategies can be used to promote reflective learning.

Provide Extensive and Timely Feedback. Although most instructors already know this, it is important to remember that the online environment removes some of the human "checks and balances" that face-to-face students have with the instructor. Although the opportunity to ask questions and have interaction with the instructor is relatively equal, feedback received through physical distance, eye contact, facial expressions, and personal topics of conversation is not present for these individuals. Therefore, it becomes even more important that the instructor take time to provide feedback that is detailed enough to paint a complete evaluative picture. This includes addressing not only the areas that were weak or in need of improvement but providing praise for the areas that were done well. Instructors are encouraged to get this feedback to the students no later than a week after the assignment is turned in.

Incorporate "One Minute Papers" and "Muddiest Point" into Class. "One Minute Papers" are short writing exercises in which students are asked to reflect on a particular topic as a form of knowledge assessment activity. Students are asked to post a quick list of the new knowledge they gained through a particular session. The "Muddiest Point"

activity allows students to identify the areas of confusion or uncertainty or to raise additional questions around the content of the session. Both of these activities benefit the students and instructor by providing feedback on what was clear and what may need further attention through the use of reflection.

Online Diaries or Reflective Journals. Diaries and journals promote continuous reflection throughout the course. Entries can be self-directed or promoted by an issue, question, or experience posed by the instructor. Journals allow students to reflectively interact with various course topics and experiences and, as noted earlier, critically examine how their values, beliefs, and attitudes fit with the material. This is a way that promotes growth beyond what regular instructor-and-student interactions provide.

Conclusion

The instructional strategy framework discussed in this chapter is clearly a work in progress. Although the framework is based on well-recognized theories of learning and represents a synthesis of ideas from multiple perspectives, it is not fully developed, nor is it all-inclusive. Additional principles will be added as the online program continues to develop and evolve. The specific techniques for applying the instructional principles highlighted in this chapter are currently in use in the HRE Online courses and continue to be enhanced each time they are implemented. The possibilities for application of the instructional strategy framework are only limited by the creativity and energy of the instructional designers and course instructors.

The purpose of this chapter was to present a perspective of online teaching and learning strategies that looks beyond the traditional paradigm of instruction. Once such a perspective is adopted, instructional designers can incorporate the key elements that are needed in quality online learning environments.

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