Creative Wings in Distance Education Technologies

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Here are the questions that invariably are heard and often asked: ***"What is so good about distance learning?" "Why should it be used in a classroom?"*** _Distance learning_ presents many more opportunities and possibilities in the classroom than a traditional face-to-face setting. Instructors can extend their reach to a global audience when including technology in the classroom. _Distance education_ is one of the tools that promises to remove the barrier of geographic location, because it increases time and place flexibility, provides just-in-time learning, reduces costs, and has quicker time development than traditional material development—such as print, textbooks, information, and so on. For example, it is easier to use Web authoring tools to develop and disseminate information on the Web, which can be accessed by a large number of students, than publishing the information to be distributed and sold to students in bookstores. Another advantage of _distance education_ is that it can provide students with the opportunity to move through course material at a self-set pace, which increases meaning for them. If students are able to construct their own meaning, the content will be more relevant. An advantage of using modalities such as chat rooms and e-mail aids students who are apprehensive about participating in large-group settings. These no threatening environments allow those students to be less self-conscious and more apt to participate and communicate their ideas and questions.

Because _distance education_ classes are not limited to specific time blocks, there are no time constraints, and students have access to a wealth of information according to their time schedule, at their own leisure, and, most important of all, at their own pace. It makes learning more utilitarian—not only does learning take place when the student has time, but also any research can be done at home, which makes learning more functional and effective for students. For example, in an online course, the instructor can easily add links to related Web sites, or students can search for related material on their own to improve their understanding of a specific concept.

The success of a virtual classroom depends on how effective the chosen media is and how it can be included in the curriculum. Knowledge of the various interactive modalities or tools that can be used in the classroom is important when integrating technology into the curriculum. To understand the nature of technology, we first need to distinguish between the kinds of technology. The history of instructional media has evolved from the printed word to various electronic media. The different types of tools are as follows: _"electronic meeting systems and presentation tools, online conferencing/chat, whiteboard conferencing/Soft Board, videoconferencing, electronic mail/listservs, hypermedia/multimedia, and word processing tools"_. Many items that are in print form are also available in our society in a multimedia form. For instance, if someone is looking for a poem written by William Wordsworth, it is not necessary to go to the library and find a book of poems.

All that is needed is to go on the Web and search for poems by William Wordsworth. Thousands of links will be returned, ranging from the biography of William Wordsworth to his actual poems. The Internet provides vast information to the user and is one of the most powerful tools of _distance education._ In addition to the Internet, there are other tools that are very powerful but are different in regard to the type of communication.

There are two types of classifications possible in _distance learning courses_ in regard to time: **synchronous** and **asynchronous.** Asynchronous communication is useful in that it allows for the student to work at his or own convenience and at his or her own pace. "The synchronous teaching mode contributes to collaborative learning through joint problem solving scenarios". Using both types of communication is ideal in _distance education_ because it produces interactivity. An essential challenge of a distance learning course is _promoting and sustaining interactivity. "Distance learning practitioners tend to view interaction as the single most significant attribute that defines a contemporary distance learning experience". "The ultimate in interactivity and motivation is the process of personal knowledge construction"._ The best medium to use in distance education always offers the user an opportunity to interact with their learning. _"If students and teachers maintain proper interactivity in the classroom the concept of the virtual campus is likely to be successful"_

In addition to classifying communication by time, one can also classify it by location. There are examples of synchronous communication at the same location or at different locations, as well as asynchronous communication at the same location or at different locations. Each type of communication method has benefits. The instructor must assess the needs for the course in order to select the modality that best suits the course's needs. These two types of classifications—time and location—answers the questions of when and where the user will be using the tool, and are vital to selecting media. _"We need to consider the extent to which a given technology will allow the learner to control the time and place of learning"._ Examples of these types of communication are summarized in Table 1:

Different Forms of Distance Education Tools Categorized by Time and Location

L O C A T I O N		Time	
		Synchronous	Asynchronous
	Same	Lecture Group Discussion	Libraries Computer Labs Laboratories
	Different	Soft Board Videoconferencing Teleconferencing Online Conferencing Whiteboard	E-mail Internet Bulletin Boards Remote Labs Listservs

Modalities

Creating an _effective distance learning_ course requires use of the appropriate modalities to achieve the objectives of the course. This does not mean that course designers should use every available modality, rather that they should choose those that would directly contribute to enhancement of learning. By following the _principles of instructional systems design (ISP),_ a course designer should be able to select the tools that will facilitate learning for their course. ISD refers to the systematic and

Reflective process of translating principles of learning and instruction into plans for instructional materials, activities, information resources, and evaluation. The following sections discuss _different technologies_ available _for distance learning courses._ These include _WebCT, software simulation, remote labs and Soft Board._

WebCT

The World Wide Web, for example, is a powerful medium for education; however, merely posting a course syllabus, notes, and assignments to a Web site greatly diminishes the effectiveness of using the Web for distance education courses. One reason many online courses follow the format of simply syllabus, notes, and assignments is that instructors do not have the technical knowledge to put together an elaborate Web-based course incorporating communication, collaboration, and interactivity. The World Wide Web Course Tool (WebCT, http://www.webct.com/) is a comprehensive program developed at the University of British Columbia. WebCT allows instructors to design Web-based courses that are beyond the capabilities of a person with little or no computer programming experience. WebCT contains many educational tools that can be used for online courses. These tools can be broken down into four separate categories: _content, assessment, communication,_ and _course management._

Software Simulation

A software simulation is a computer program that models real-world situations. "Simulations focus on the learning environment without usurping control from the learner, offering unique learning opportunities in nearly every subject area". Simulations allow students to experiment and practice high-risk situations or distance learning by exploring issues and trying out alternative solutions or strategies in a no threatening environment. Through simulations, the learners make decisions and see the consequences of those decisions. The important word here is see. The learner is in a situation in which the results are posted, but no physical consequence occurs. To produce these situations, high-tech programs are implemented, which provide the student with an environment that requires the use of higher-order cognitive and problem-solving skills. "Students must be engaged at a high level of cognitive load since they have some understanding of the domain and of the model of simulation". Simulations exist in four major forms: simulators (as described above), gaming, role-playing, and modeling.
Gaming is, of course, the oldest form of simulation. It exists in many forms today, yet goes back as far as we are aware. Simple games of sticks and balls, all the way through four thousand years of tweaking and perfecting, to the extravagant flight simulators and PC versions such as solitaire, chess, SimCity, and the most widely

used in education, Logo. These games allow one user or multiple users to make a decision and undergo the immediate consequences. If a mistake is made, the participants are allowed to go back and change their tactics. Games that require multiple users also introduce the element of competition or cooperating strategies in addition to problem-solving skills. Gaming teaches competition strategies, cooperation and teamwork, conflict resolution, and implementing policy. Role-playing is a form of simulation that re-creates a realistic situation in which the users assume specific roles. Successful role-playing has been used in a multitude of situations because of its innate flexibility: the closer the role-player attempts to recreate a real-life situation, the more the role-play evokes in the peers and the audience. Role-playing is used to interpret inter- and intrapersonal relations and leadership skills. The feedback from role-playing is instantaneous and very gratifying for both the participants and the observers. The mere fact that the participants are "allowed" to step out of their everyday situations and enter into a world of make-believe provides for an astonishing breakdown of barriers and tension. This type of simulation "allows the user to manage successfully with high stress and critical thinking situations by collaborating, inventing, exploring, evaluating, and mastering new behaviors and human interactions".

Modeling closely resembles reality and is used to value how a system and its parts interrelate. It is designing some form of physical or symbolic representation of a system, testing it, and analyzing the results. Models can take many forms; they can be physical or symbolic, static or dynamic, or normative or descriptive. No matter what kind of model it is, the benefits are similar—by producing the model, one can attempt to find the best solution for a particular problem and identify design flaws. With modeling, researchers develop theories on how a system operates because models allow for exploration of a system without disrupting the real system. Prediction is very important in this type of simulation, as it is also in the study areas that model simulations are used in, such as education, research, and development.

Remote Labs

Upon doing Researchers, a conclusion was drawn that there are definite weaknesses in courses that are of a technical nature that require laboratory experiments because of their no concrete representation of reality. Researches focuses on efforts of manipulating novel technologies with distance education and applying those technologies as cognitive tools to in turn enhance the current instructional systems. The researchers have implemented an idea to solve the problem of putting highly technical courses online: *remote labs*.

Remote labs allow students to perform experiments on the Internet. The remote labs allow students to use breadboards to design electrical circuits without using wires. The actual experiment is conducted on the Internet through a host computer. This differs from software simulation in that the user is actually performing a real experiment using the computer as a front-end interface to lay out the connection onscreen and for downloading it to the board.

Soft Board

SoftBoard is an **application sharing system**—that is, a system that allows multiple users to engage in a shared activity from remote locations. The participants are exchanging ideas in real time. Application-sharing systems, when used in

conjunction with other modalities, enhance the learning environment for distance education. There are two parts to the SoftBoard. First, when the URL is accessed, the user will be in a chat room. There is an icon to click, which will bring the user to a SoftBoard frame. In this frame, the user can draw using figures or write freehand using the mouse or a light pen. A light pen is an Electro-optical pointing device that allows the user to write directly on the screen. There are also other functions such as moving the drawn objects, changing colors, deleting, and erasing.

Figure2. This illustrates the login screen for SoftBoard using a browser.
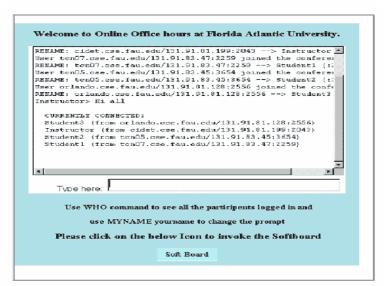

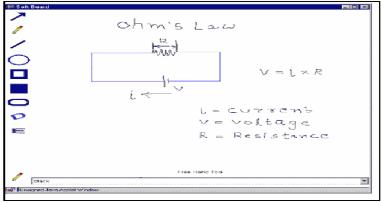*Figure 3. This illustrates the chat room feature of SoftBoard.*

Figure 4. This illustrates the SoftBoard frame.

Conclusion

Technology has revolutionized the world of education. It has made a plethora of information available with just a click of a button. No longer are we constrained by distance or time. The role of teachers has been changed from merely delivering information to guiding students in their discovery of knowledge. Innovative technologies have enhanced distance learning. In the past, _distance education_ courses consisted of study and research materials such as workbooks, textbooks, and videotapes with virtually no interaction and hands-on experience. Today a _typical distance education_ course incorporates educational tools such as _WebCT, simulations, remote labs, and SoftBoard._

Without technology, _"distance learning degenerates into the old correspondence course model of independent study. The student becomes autonomous and isolated, and eventually drops out"._ Students are now in an interactive environment that allows them to creatively construct their own knowledge and learning. The definition of distance education has changed from a course where there is a separation between student and instructor to "increased educational opportunities for broader segments of the population, accommodating different situations and needs". Use of modalities such as WebCT, remote labs, software simulations, and SoftBoard to revolutionize the creative wings of distance education.

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