Maximizing the Distance Education Learning Environment:

Using Technology for Mind Expansion

by

Gary R. Schornack

and

Charles E. Beck

Abstract

Administrators may believe that distance education merely involves taking existing readings, exercises, handouts, and posting them to the Web. Such an approach, while cost-effective, is not effective. A new world of distance education also demands new thinking. How the process is designed, delivered, integrated, and supported are key components to a complete distance education system. The meaningful transition to e-education has just begun. To determine measures of effectiveness and efficiency requires innovations in social and political thought, even more than mere technology. The distance education process requires feedback from the professor, from the student, and from the wider community, especially businesses who hire the graduates. E-learning and higher education are reaching new heights and are changing the functions of the university. E-learning has changed the ground rules of everything including time, distance, and pedagogy. We now have new ways to reach and interact with students, present rich-content in courses, and deliver the technologies of the smart classroom to students wherever they are in the world.

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Introduction

The rapid changes in distance education as part of the information age have intensified

the need for improved student communication and interaction. In a typical educational setting,

students are required to present their ideas to the class. More and more students are

incorporating technology into their learning experiences, breaking the limitations of projectors,

screens, and flip charts. On the horizon is "Tele-immersion," which Jaron Lanier (2000) describes

as "the 'advanced shared environment' that will one day create the illusion that you are in the

same room with people at a distance."

The education sector is becoming more demanding. "The entire e-learning

market is evolving quickly" (Aldrich, 2000). Some confusion stems from the conflicting

terminology: "we have several names for essentially the same thing—for example,

'distance education,' 'distance learning,' and 'distributed learning'—while we sometimes

use one term, such as 'virtual university,' to refer to very different types of educational arrangements" (Wolf & Johnstone, 2001). Initial statistics indicate "an estimated 1,661,100 enrollments in all distance education courses, with most of these at the undergraduate level" (Heller Report, 2001). The rapid rise in distance education has lead some theorists into "confidently predicting the end of the university" (Neal, 2001). For example, Peter Drucker is quoted as saying, "The future is outside the traditional campus, outside the traditional classroom. Distance learning is coming on fast" (Gubernick & Ebeling, 2001). However, the evidence does not point that clearly toward the demise of traditional education. For instance, the development of Internet 2 as having great potential for networked undergraduates (Basch, 2001); and anecdotal evidence points toward a preference for traditional modes of delivery, particularly at the undergraduate level where "'brick' is preferable to 'click'" (Dyrud, 2001). The educational community must creatively customize this new environment.

The rapid growth of e-learning has taken many institutions by surprise (Carlson & Repman, 2002). Scholars and practitioners have begun to address this "rethinking" of the distance education process. The advent of digital technologies is now transforming higher education's culture and content; furthermore, the "technology of higher education is becoming as much a function of market mechanisms as digital media" (Schrage, 2001). As with any new approach, however, skepticism remains. A recent study by a career information and research firm suggests that employers may be cautious about hiring job applicants with "dot-com diplomas" (Jones, 2001). Such concerns recognize that overall, online learning is still in its infancy (Kuchment, Binlot, & Ferro, 2002).

New Courseware for Distance Education Learning

Administrators may believe that distance education merely involves taking existing readings, exercises, handouts, and posting them to the Web. Such an approach, while cost-effective, is not effective. Success requires creating new "courseware" representing a significant

capital expense (Goldstein, 2000). Beyond course development, further support includes equipment, support personnel, and training: "Support for faculty and staff is not limited to money and technical support, but must also include support for training, released time, acknowledgment of intellectual property rights, and academic credibility for tenure and promotion" (West, 1999). Lee identifies some of these conflicting perspectives on distance education:

    * Distance learning is a new and universally desirable phenomenon.

    * Distance learning will totally supplant campus-based learning in the future.

    * Distance-learning methods are ineffective for most university-level learning goals.

    * Distance-learning experiences are inferior to campus-based learning experiences.

    (1998)

Ultimately, acceptance of distance education requires that institutional stakeholders overcome ingrained attitudes. "Online learning does not replace or minimize the importance of teachers or trainers, but rather removes the physical constraints of buildings and distance, thereby expanding the teacher's potential reach, efficiency and effectiveness" (Stoll, 2001). Some organizations may simplistically believe that merely adding computers will solve any communication problem. For example, "Online courses and degree programs open up higher ed to anyone with access to a computer and a modem" placing the " tools for obtaining a well-rounded education literally at the fingertips of anyone with Internet access" (Thomas, 1999); "You can now find the online equivalent of almost any brick-and-mortar learning environment" (Mangis, 1999). But as Greengard (2000) observes, "you can put information at people's fingertips, but you can't force them to use it effectively."

Not all institutions adapt to distance education "cheerfully and quickly"; among the reasons, "the greatest deterrents seem to be the faculty, the costs, and the reluctance to change their perception of themselves as the "only show in town" as purveyors of knowledge" (West, 1999). On the practical level, shifting to distance requires training people on equipment so they can use it effectively. Such training involves a significant change in attitudes. Patterson (2000) believes that becoming effective with an electronic medium means overcoming FUD: "fear,

uncertainty, and doubt." In particular, institutions must address how to "support faculty who worry about how to teach and learn in these new environments with these new tools" (Boettcher, 2000). From the student perspective, a shift to distance means more responsibility of the student for his or her education. "Learners need to develop personal learning contracts, targeting their own objectives for training rather than the instructional objectives of the course" (Masie, 1999).

Maximizing Distance Education Objectives

Many academic institutions consider "the prospect of increased revenue from distance education" as a significant factor in offering distance courses (Wolpert, 1998); however, planning for such an endeavor must consider "the intent of both pedagogical and financial success" (Robinson, 2002). Financial considerations tend to influence the selection of level of courses; according to the Heller Report (2000), institutions offer for-credit distance education courses more at the undergraduate than at the graduate/first-professional level. Although distance education focuses on both traditional and non-traditional student audiences, it usually attracts more of the non-traditional adult learner. Effective programs thus can benefit by creating a vision of adult development, accommodating "the special social, psychological, and political characteristics of adult learning" (Russell, 1999). To confront the significant conflicts in the objectives for a distance program, universities must ask themselves some probing questions, as outlined by Newman (2000):

* Will the same modes of socialization to the life of the mind work for an ever- broadening

   share of each age group of students?

* Which of these activities make an impact and which are cheerfully ignored by

   the students?

As these questions tend to clarify the market niche for the distance program, they may seem to focus only on the financial objectives of a program. However, this process implies that distance programs are tapping into a different group of students than the traditional target audience.

Faculty Development is Critical

Ultimately, the move into distance education highlights a major lack in higher education: People who do the majority of teaching at colleges and universities (professors, lecturers, TAs, etc.) get no formal training in teaching at all. Institutions assume that "a professor who cannot use a piece of chalk and a blackboard to teach effectively will be able to do better when we give him or her computers, VCRs, DVD players, PowerPoint presentations, video cameras, the Internet, and a smorgasbord of digital media" (Strauss, 2002). Cheryl White (2000) identifies the areas of faculty development needed for an effective distance education program. These recommendations appear in Table 1.

TABLE 1: FACULTY DEVELOPMENT FOR DISTANCE EDUCATION

Comfort and effectiveness with all technology used in the course

Ability to model use of technology

Ability to track student activities in the course

Willingness to be innovative in teaching methods

Willingness to be innovative in use of technology

Willingness to learn while doing

Willingness to work cooperatively with technical support/design staff

Tolerance of change

Ability to commit significant time to the course

Ability to handle a high amount of interaction with students

Being a good facilitator of communication

Being able to write clear, focused messages

Providing clear expectations of student responsibilities in the course

Ability to design discussions to involve the students

[White, 2000]

The Growing Potential Audience

Whether or not an institution considers potential students a "market" or not, educators must understand the audiences for their programs. Employers use such training based on its cost effectiveness: in addition to being less expensive than outside training, employers can offer employees "the chance to learn at their own pace and from any location" (Orubeonodo, 2001), thus giving employees the chance to complete their education while working full-time (Klor De Alva, 1999). This group, one of the fastest growing markets in higher education, needs institutions that can "design flexible, customized programs to meet their education needs and lifestyles" (Worley, 2000). According to West (1999), "The growing college population are adult students over the age of 25 who are non-residential, working full-time, perhaps with a family from diverse backgrounds."

Williams (2001) identifies the potential audiences for education in general, including the subset of distance education. Three models describe the student's role in learning: the student-as-product, the student-as-worker, student-as-consumer (Williams, 2001).

Student-as-product. This model emphasizes work in the classroom, tending to employ mostly lectures and discussions to deliver information to the student.

Student-as-worker. As learning mechanisms, this model employs inquiry, activity, and discovery strategies that emphasize exercises and projects, with students working either individually or in groups.

Student-as-consumer. This model is particularly popular among higher education administrators: sales of a particular product (i.e., credit hours generated) serve as the simplest way to manage budgets; and student enrollment and classroom evaluations provide the simplest way to evaluate faculty performance.

The student-as-product and the student-as-consumer models are instructor-centered (Williams, 2001). In fact, some skeptics see computer-based courses as "thinly veiled field trials for product

and market development," in which students "are studying their courses" while "their courses are studying them" (Noble, 1998).

Effective Online Course Development

Defining the course and creating the learning objectives for distance education is a time-consuming process: "Developing an effective syllabus and teaching style takes time. Email is a different medium from the classroom and requires different techniques to be used effectively by an instructor" ("Debating," 2000). Since the structure of the course must consider both the content material and the learner, the "goal should be to use the new technologies to enhance rather than diminish higher education's critical roles" (Connections, 2001). This redesign process also requires the students to take greater responsibility for their own education. "If the students aren't doing the work, learning is not occurring" (Strauss, 2002). Cini (1998) identifies the ways to design a course to meet the needs of the distance learner, as shown in Table 2.

TABLE 2: CRITERIA FOR DEVELOPING AN EFFECTIVE ONLINE COURSE

Assignments that require the learner to actively engage with the course work
   and one another

Discussions, activities, and projects that entail collaboration between learners

A format that fits students' schedules, career goals and learning styles

Access to faculty, resources, and classmates

Convenient access to the class anytime and from anywhere

[Cini, 1998]

The process of course development involves the sequence of ideas, types of examples, and word choice. The educator prepares for multiple repetitions to reinforce concepts, including previews, presentations, and reviews. When presenting an abstract concept, the educator needs

to build up to complex ideas through the simple, and to bring ideas to life with examples, metaphors, and analogies. The amount of variety in approaches will appeal to the multiple learning styles in the audience. The "one-text/one-test/one-delivery-mode-fits-all" approach to instruction is becoming less and less appealing (West, 1999). According to some educators, "a well-designed face-to-face course includes all of the positive aspects of a well-designed online course (e.g., interactivity among students, access to external sources of information)." However, those who rely on lecture tend to dampen, not promote, interactivity among students, since the "norms of face-to-face classroom militate against more active participation by students in the educational process" (Cini, 1998).

For distance educators, the aim is to reproduce the functionality and the "look and feel" of the classroom in a new operating environment (Weigel, 2000). Part of the feel is the sense of camaraderie and belonging among class members. "To foster the development of the online class as a learning team, students should be encouraged to assist one another when they confront obstacles rather than encouraged to ask the instructor for help" (Cini, 1998).

With the target audience of non-traditional students, most distance education programs want to provide meaningful learning for adults. This means creating instruction based on an authentic model of adult learning and development. Constructing such a model would build on four general principles:

> - plan for learning across the lifespan;
>
> - identify the distinctive characteristics of adult learners,
>
> - emphasize the goals of adults,
>
> - create adult-situated contexts for learning (Stites, 1998).

An adult-focused model would also incorporate an inquiry-based curriculum, whose objectives include life skills as well as "basic" ones, performance-measured outcomes, and a learner-centered locus of control (Russell, 1998). Within these adult-focused principles, educators would do well to follow the Seven Principles for Good Practice in Undergraduate

Education as published by the American Association for Higher Education (Merisotis & Phipps, 1999):

- encourage contacts between students and faculty;

- develop reciprocity and cooperation among students;

- use active learning techniques;

- give prompt feedback;

- emphasize time-on-task;

- communicate high expectations; and

- respect diverse talents and ways of learning.

Ultimately, faculty and administrators must create the mix of technology and process that comprise the method of distance education: "The expense of creating highly interactive and pedagogically rich content is another challenge" (Johnstone, 2002).

The Virtual Classroom

To expand the ways people learn in our Information Age, institutions increasingly turn to Internet-based education and to virtual classrooms. For some thinkers, such a change represents a minor adjustment: "a virtual classroom is not a special form of distance learning environment, but just another form of classroom" (Williams, 2001). Internet-based programs become attractive as a way to meet diverse needs with flexibility. Further, the increasing use of the Internet has brought adaptation in traditional distance-education formats, especially based on the type of institution. For instance, two-way interactive video was more likely to be used by public 4-year institutions than by any other type of institution (Heller Report, 2000). In using the full potential of distance media, educators can select modalities to fit the need of the user.

Using Internet programs "has the potential to revolutionize the way people learn – not only in terms of the medium used, but by making continuing education a life-long activity" (Robb, 2000). Proponents of virtual universities point out that networked computing permits us to replicate the classroom experience by creating "virtual groups" of students (Neal, 1999). Also teachers can efficiently reach all students through general e-mail answers to common questions

(Wang & Newlin, 2001). The virtual classroom can bring out the Internet's full potential by including diagnostic tutorials, voice-overs, animated graphics, online text and a tutor who can be contacted (Stoll, 2001). According to David Frabotta (2000), "The virtual classroom is more than a buzzword. It represents a classroom furnished with the Internet, e-mail, digital cameras, instant messaging and videoconferencing, enabling students to talk to professors, instructors, industry experts and other students from anywhere in the world using audio and visual components."

Multi-media Coordinator

Distance education has the potential to foster anonymity. "In the virtual classroom, instructors are recognized solely by the fact that their screen names are different from their students' (Wang & Newlin, 2001). While such an arrangement may create a non-intimidating environment with a level playing field, it may also create role playing and gamesmanship with the student (Wang & Newlin, 2001). High tech remedies may solve some issues while compounding the problem (Noble, 1998). And a focus on the media may change the role from educator to technology coordinator:

The teacher becomes, in many settings, a multi-media coordinator, for other delivery systems will be in use: videodisk, videotext, audio and videocassette recorders, telephone, videophone, radio, newspaper, closed circuit television, open broadcast television, learning packages including print and non-print materials, home computers, two-way interactive classrooms (Hankin, 1999).

Virtual Classroom Expectations

To expand the ways people learn in our Information Age, organizations increasingly turn to Internet-based education and to virtual classrooms. Internet-based programs meet diverse needs with flexibility. According to Drew (year), "In addition to the time and geographic flexibility, its modalities can be changed to fit the need of the user." But even more significantly, use of Internet programs "Has the potential to revolutionize the way people learn - not only in terms of the medium used, but by making continuing education a life-long activity" (Robb, 2000). Beyond just the Internet itself, the virtual classroom brings out the Internet's full potential. According to

David Frabotta, "The virtual classroom is more than a buzzword. It represents a classroom furnished with the Internet, e-mail, digital cameras, instant messaging and videoconferencing, enabling students to talk to professors, instructors, industry experts and other students from anywhere in the world using audio and visual components" (2000).

Both educators and adult learners are using the Internet, "learning to ride the technological wave of the future." On this wave, the Internet can help educators communicate with colleagues, pursue professional development, search online databases, interact with students in the classroom, and search for new jobs (Rosen, 1996). Ultimately through the modern educational process, we are leading toward a knowledge-based social order, interweaving homes, schools, offices, and communities into a web of intelligent communication services offering unparalleled opportunities for accelerating scientific progress, economic development, education, and other revolutionary changes (Halal, 1992).

Although students tend to seek out distance education opportunities, educators must help students clarify their own expectations for taking such a program. Additionally, students need to learn skills to succeed: How to take notes, how to get organized, and how to deal with the universe of data that obscures the information they actually need to understand. Through the Internet, students have access to millions of books and billions of Web pages, but they need to learn how to use them effectively (Strauss, 2002). Table 3 (Short, 2000) outlines some of the questions students need to ask. These questions have implications both for the student and for the faculty member.

TABLE 3: STUDENT QUESTIONS FOR ONLINE LEARNING

Student's Questions

What are the computer specifications required for this program?

Am I prepared to deal with the technology and time management demands of online education?

29

How experienced is the university faculty at offering the course or

curriculum, both in subject matter and in dealing with an online

curriculum?

How willing are faculty to spend time communicating with

students?

Does the online course or program facilitate student interaction in

any way?

Am I someone who can learn online?   [Short, 2000]

Faculty Effort

Plan for learning across the lifespan;

Identify the distinctive characteristics of adult learners,

Emphasize the goals of adults,

Create adult-situated contexts for learning.   [Russell, 1999]

To determine the overall purpose of distance education, institutions must recognize the need for "smart learners, not smart classrooms"; by themselves, smart classrooms will not be enough. For the process to succeed, faculty need an environment that reduces the teaching-related administrative tasks so they can focus on developing courses and presenting materials (Strauss, 2002).

Instructional Technology Delivery

Media covers the specific technology components for the instruction, the capacity of the hosting system, and the ability of the student's equipment to interface with the host system. Such consideration usually falls under the domain of the Instructional Technology professionals available to work with the faculty. In addition to providing course content, however, these systems must address security issues, especially with test administration (Mirabito, 1996). Conversion to electronic media impacts both the instructor and the student.

From the student's view, the distance approach brings new difficulties, like "Navigating a course's options and jargon – various folders, forums, study guides....The ideas are great, the people are great, it's the technology that can be overwhelming if you don't have a background in it" (Loftus, 2001). Table 7 identifies key instructional issues related to selection and use of technology.

TABLE 4: MEDIA IMPLICATIONS FOR DISTANCE EDUCATION

Identify new technologies

Become competent with a variety of technology approaches

Demonstrate multiple visual tools

Become comfortable using multiple technology tools

Reinforce new technological tools for communicating Information

Be able to sequence ideas in a logical presentation sequence

[Beck & Schornack, 2001]

Learning technologies have revolutionized the traditional classroom, created new possibilities for eLearning, but technology alone is not the point (Grush, 2002). Technology provides the means of accessing and using knowledge. Inaccessible information remains of little value (Feldon). Using the information in a distance mode requires developing such a level of trust between the instructor and the student that the student can freely voice doubts and can depend on the instructor to provide guidance in how to use the process ("Debating," 2000). Used properly, both the computer and the Internet permits nonlinear learning strategies where students can move between subjects in their own time and order (Armstrong, 2000). Rather than the

medium making the difference, according to Strauss, "It's the particular way in which you use it" (2002). An Internet-based course can hold visitors, bring them back, and becomes a favorite of the users (Masie, 1999). Done properly, distance education can blend powerful new technology: the Internet, intranets, and e-delivered courses – with traditional media such as instructor-led courses, audio- and videotapes, articles, and books. The result yields a powerful, accessible learning information source" (Boxer & Johnson, 2002).

Educator's Web Site

A website is an important tool in today's student learning environment. It is important that the student can find what they are looking for in order to help them feel part of the course and the learning experience. The following list of items includes the key sections that every educational website should contain:

1. **Homepage:** This should be an introduction to the site and also include easy-to-find navigational buttons to the rest of the site. A picture of the educator is always nice to help put a face with the name. Additional information that can be provided on an educator homepage includes:

    - Discipline

    - Name

    - Title(s)

    - Phone

    - E-mail

    - Office Location

    - Web site

    - Courses Taught (Can link to syllabi or course Web sites)

    - Areas of Expertise

    - Teaching Philosophy

    - Education

    - Professional History

- Selected Publications

- Current Research

2. **Courses:** This section is very important especially if the educator teaches more than one course. Each course should have a dedicated page that includes an online course syllabus, including all course materials, handouts, and course links. These items can either be embedded in this one page or they can be accessed via links. It is very important that each item included in the syllabus have links to them (i.e. online sample exams, note pages, resources, etc.).

3. **Links:** The educator's favorite links divided into categories are also common and show what the educator values. These could be other professional links or could be personal interests (i.e. online grade calculator, thesaurus, dictionary, favorite search engines (including advanced searching technology), link to campus library resources, style manuals for required written projects, etc.).

Students look to their professor for guidance in their journey through life. Therefore there are other sections that could be added to an educator's site to help extend the reach of the professor's influence. These following items are not necessities but can be included in the site to provide students with a feeling of inclusion in the educator's world:

1. A vita or profile consisting of the educator's teaching philosophy, educational and professional experiences. This page is usually linked to from the homepage and lets the student know what the educator's background is and what experiences they have had.

2. Primary teaching and research interests along with any professional activities.

3. A section on study skills outlining the steps and methods that the educator believes the student should follow to be effective in performing well in his/her courses.

4. Ideas that the professor has on securing a job in the specific industry covered by the course are also considered to be helpful to students who need a good place to start

their job search preparation. This can feature useful career tips, resume and career links and job hunting sites.

Despite these significant variations, faculty can benefit from some practical guides that can help them develop a methodology effective for online students. Table 5 identifies these practical methods.

TABLE 5: PRACTICAL METHODS FOR DEVELOPING

EFFECTIVE DISTANCE EDUCATION

View your role as coach, facilitator, and coordinator

Listen to your students

Don't give answers – ask questions

Allow students to learn by making mistakes

Encourage students to solve their own problem

Encourage students to do things their own way

Provide guidance and instruction at first – then decrease direction over time

Be open and honest – share pertinent information with students

Provide learning opportunities

Measure your success through the success of your students.

- Adapted from Cini, 1998

Teaching methods in general, however, must adapt to the distance media, where faculty do not have the traditional contact time with students. As a result, faculty need to adapt their

methods to the distance media, following the specific online strategies identified in Table 6 (Brown, D. 2002).

TABLE 6: SPECIFIC ONLINE STRATEGIES

Let students know when and how you prefer to be contacted,

including how often you intend to access e-mails.

Create online forums, threaded discussions, and chats.

Use the Internet to access experts and ideas from "beyond the classroom."

Form student study groups with specific intent.

Keep groups small, suggested optimal size no larger than eight.

Assign teams to work together on projects.

Link each student with a mentor or a specialist in the field.

[Brown, D. 2002]

Combining teaching method with technological skills can help students reach the higher cognitive levels. Such a process requires that a faculty member becomes a "facilitator, collaborator, and guide who makes instruction learner centered" (Notar, Wilson & Ross, 2002).

Online Syllabus

Considering the new role of the educator as a provider and facilitator of knowledge, the student can have the primary resources available with a "click" to a link. An online syllabus that links the following makes learning easier for the student and eliminates most, if not all, of the paper handouts. See Table 7.

TABLE 7: LINKS FOR ONLINE SYLLABUS

- Educator's E-mail address

- Current style manuals

- Study skill guidelines

- Student note pages for each unit

- Sample test questions with computer scoring

- Many texts have 1st three chapters available free online

- Essay test questions

- Class speaker note pages and vita

- Project outlines and guidelines

- Sample projects

- Links to improve speaking and free backgrounds and tips

for PowerPoint presentations such as Presenter's University

- Library guide developed for specific courses

- Peer evaluation forms

- Key contacts for students

The opportunity for teams to communicate with Yahoo groups, Hotmail groups, etc. provide the communication tools for student support which can answer many questions outside of the classroom.

Effective Visualization Online

To be effective written presentations must also integrate appropriate visual reinforcement. As Hill (2000) indicates, "the American attention span isn't what it used to be, and the competition for people's hearts, minds and time has never been fiercer." Since the audience is accustomed to sound bites, the writer must reinforce information with visuals to re-direct their attention. Visuals must be designed for impact: few words on each visual reinforcing one main idea. Table 8 provides general guidelines for use of visuals.

TABLE 8: GENERAL GUIDES FOR VISUALS
Keep visuals simple - too much detail confuses and distracts. Adapt visuals from books, magazines, web sites, and clip art – remove portions not relevant for your audience or your emphasis. Use sharp, primary colors for contrast - pastels and yellow wash out to gray when projected in a large room. Use minimal words and short labels - too many words counteract the effect gained by visual reinforcement. If you need a complex visual - build toward it by presenting smaller parts, then showing how the pieces fit together. - Adapted from Beck, 1999

Essential Visual Guidelines

After selecting the type of visual, the presentation online must follow guidelines, such as those shown in Table 9.

TABLE 9: GUIDES TO SPECIFIC TYPES OF VISUALS	
Lists	Follow the rule of sixes - NO MORE THAN 6 words per line 6 lines per slide 6 "word" slides in a row
Photographs	Use simple photos with labels to highlight information. Photos may confuse - they usually contain more than the speakers wants to deal with.
Drawings	Use simple schematics for visual emphasis. Schematics emphasize concepts or equipment better than photographs. Simple schematics serve as visuals;

	complicated diagrams belong in a handout or report appendix.
Tables	Use simple tables for comparison or contrast. Complex tables present data rather than illustrate key points, so keep complex tables for handouts, simple tables for visuals.
Graphs	Use graphs to visualize relationships among data. Simplify the graphs for visuals, with few items compared on the same graph. Place exact scientific plots in a handout or report appendix; use simplified graphs for visual reinforcement. - Adapted from Beck, 1999

Student Feedback is Critical

Student feedback on distance education begins with practicality. "Students were taking distance learning courses for their convenience in helping them cope with the demands of busy schedules and to meet the requirements of their programs of study" (Bower, 2000). Research on student response often focus primarily on the technology involved; however, the "results seem to indicate that technology is not nearly as important as other factors, such as learning tasks, learner characteristics, student motivation, and the instructor" (Merisotis & Phipps, 1999). Through use of student chat rooms and instructor feedback through e-mail, "most university graduates would likely agree that such opportunities for discussion were among some of their most meaningful educational experiences" (Lee, 1998).

Though often overlooked, student feedback is central to effective communication. "Communication refers to the message *perceived* rather than to the message *sent* in an organization" (Beck, 1999). Unless we know what that message was, we really have no idea what communication has occurred. As Stephen Manes (1996) puts it, "E-mail often causes problems that the sender is the last to know about." But the result is not all negative; through

feedback, writers draw connections to others. According to Mary Furlong (2000), "You go online because of information. You stay online because of the relationships that form."

Online Delivery Outcomes

Informal and anecdotal evidence about online education finds that "basic demographic characteristics such as gender and age are not reliable predictors of cyber-student performance," and that students who were members of a cyberstudy group had higher final grades in our class than those who preferred to study alone (Wang & Newlin, 2002). Instructors must become more aware of differences to identify at risk students, because the usual cues associated with student anxiety, inattentiveness or apathy are not present in the virtual classroom. Specifically, instructors need to examine low hit rates to the course home page and inactivity writing or reading forum postings (Wang & Newlin, 2002). More formal findings appear in the results of a survey of faculty in distance education, as shown in Table 10 (Perez & Foshay, 2002).

TABLE 10: SIX BEST OUTCOMES OF ONLINE DISTANCE DELIVERY

Tutorial functions	Learners are able to use the system for study of basic math concepts and review/remediation functions, allowing more time for individual faculty/learner contact and discussion
Flexibility	Adult learners, who have significant professional and personal time constraints, have the option of working anytime, anywhere.
Self-paced	Learners are not stalled by predetermined course schedules; they may complete assignments in as little or as much time as necessary.
Privacy	Learners can operate in a private environment, interact in a computer-adaptive environment, and efficiently focus on concepts and areas they need.
Cutting edge	Developmental education learners, traditionally offered second-rate services, were being offered an attractive state-of-the-art option.

Interactive feedback   Through a computer-adaptive environment, learners receive immediate constructive feedback after each response rather than having to wait for lesson or test results to monitor progress.

[Perez & Foshay, 2002]

Implications

Through this process of change, educators need an increasing range of skills so that they can become innovators and remain in the forefront of the educational process. Most importantly, technology alone will never be the solution to improved education. Rather, educators who can incorporate technology can bring the best out of the learning process and inspire the best out of each student. Thus, schools must implement extensive professor training, improved curricular materials, and major changes to educational models before it can benefit from increased use of computers.

A new world of distance education also demands new thinking. How the process is designed, delivered, integrated, and supported are key components to a complete distance education system. The meaningful transition to e-education has just begun. To determine measures of effectiveness and efficiency requires innovations in social and political thought, even more than mere technology. The educational process requires feedback from the professor, from the student, and from the wider community, especially businesses who hire (and more importantly, fund) graduates. These stakeholders should expect to become involved in continuous feedback.

Conclusion

The primary goal of education at all levels is providing students with skills on how to learn how to learn. The process does not mean merely mastering a body of knowledge. In contrast to earlier education, "students learn best and most usefully not by being asked to master the conclusions of scholars about questions the students only dimly comprehend, but when they are given raw data, learn to ask their own questions, and come to their own conclusions" (Brown, R. 1996).

E-learning and higher education are reaching new heights and are changing the functions of the university. E-learning has changed the ground rules of everything including time, distance, and pedagogy. We now have new ways to reach and interact with students, present rich-content in courses, and deliver the technologies of the smart classroom to students wherever they are in the world. In evaluating the learning process, educators must get feedback from their students and potential students. An exchange in the "Virtual Roundtable" captures this need:

> Schaff: "You've suggested that educators have not traditionally looked for feedback from the learner."

> Schank: "That's exactly right, because they don't give a damn about students. But we do. You have to because people are going to be able to vote finally [take virtual course at another school]" [2000].

Although educators may see distance education as a "rethinking" or a "paradigm shift," the "Virtual Roundtable" addresses this process in a more succinct fashion. As the second-half of the title states, "the e-Learning Revolution Is Not about Computers; it's about Communication." While we have used a communication-bases systems model to examine the process, Mary Furlong makes the communication aspect alive ("Virtual Roundtable," p. 72):

> You go online because of information.

> You stay online because of the relationships that form.

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