Electronic Teaching and Learning: Trends in Adapting to Hypertext, Hypermedia, and Networks in Higher Education

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Chapter 5

What Lies Ahead? What Accounting Educators Anticipate for CAL in the Near and Distant Future

We are beyond the early adopter stage. People don't buy multimedia technology just because it is cool anymore. They are implementing it in real ways, mainly in sales, training and education areas. Presentations are a hot area for multimedia.

Ken Tresler (1993)

Unfortunately, while college students view the computer as an educational asset --- about 20 percent now own computers --- many faculty members fear and misunderstand technology that does not place the teacher at the center of the educational process. "Somehow," says Joe Wyatt, chancellor of Vanderbilt, where the computer has been not only well received but enthusiastically embraced, "the person who is for-technology is assumed to be antihuman."

Elfin (1992, p. 111)

In the Appendix 3 questionnaire used in our survey, we asked accounting educators about their attitudes toward the use of electronic technology in the classroom and their predictions and insights regarding the possible future of these methods. We also asked them about the attitudes of students toward these electronic aids. The responses to these questions are discussed in this chapter, and the actual replies of survey respondents are reported in Appendices 8 through 17.

How Quickly Will Hard-Cover Books and Journals Be Replaced by Hypermedia "Books"?

In response to the question, "Do you think hard-copy books and journals will continue to play a major role after the year 2000?" 35 (51 percent) of the 69 accounting educators who responded to this question responded in the affirmative.

The reasons given by accounting educators for their opinion that hard copies will continue to be of major importance included the following:

1. Books are more portable, can be available at any time or any place, and their accessibility is not affected by power outages.

2. Books are a stable medium. One respondent pointed out, "CDs deteriorate with time and can work poorly when dirty or scratched. These factors limit the reliability of CDs when compared with hard copy. A journal which is yellowed with time or which is grimy is still generally usable."
3. Books are easy to read, and produce less eye, neck, and back strain than do computers.

4. Books are easier to skim through to review, can be highlighted easily, and are easier to use as reference sources. One accounting educator summarized his feelings by stating, "Nothing beats a hard copy which you can freely thumb through."

Eight accounting educators felt that the switch from hard copies to electronic media would occur eventually, but not in the near future. Their reasoning was based on two important issues: faculty members’ resistance to change and the institutional support necessary to fund the considerable cost of the hardware required. The reasons given by educators for this opinion are summarized below:

1. **Humans are slow to accept and use new technologies, even when they offer significant cost savings.** One accounting educator stated: "Most accounting faculty are more than ten years away from even significant use of databases, motion videos, word searches, etc." An accounting department chairman commented, "I still have faculty members who use the computer very little. The fact that I send all department correspondence by E-mail makes them use the system, but this use is limited." Another educator noted, "It will take a while. Consider our penchant for hard copy. Printing and photocopying do not seem to have fallen off with the advent of the P.C."

2. **There is a lack of institutional commitment to fund the startup costs necessary to acquire the necessary hardware.** Accounting educators indicated that where hard-copy books are concerned, there is a supportive infrastructure that is firmly in place, whereas the up-front expenditures for hardware will slow the process of change, especially at colleges and universities with capital constraints. One factor that was pointed out was the constant change occurring in hardware. One educator suggested that "The rate of change of technology will have to slow down before most schools can afford the investment," and an educator from a school on the Pacific Rim commented, "There are a lot of poor people and poor countries outside the USA."

The two constraints discussed above were summed up by the following comment received from one school: "The combination of an elderly staff that is not up to date, plus an administration that provides no equipment or funds, guarantees that we will be using hard copy books for a long time."

3. **Many respondents also noted that until all students have a laptop computer, hard copy texts will continue to be used.** One educator suggested, "In order for computers to replace hard-copy texts, all students must be able to afford computer equipment. The cost factor will keep hard-copy texts in place for the next 10 to 15 years, but not beyond 15 years." The ever increasing cost of textbooks may be an impetus for the use of electronic media, however. If a student were able to use a lap-top computer for all of his or her classes instead of buying a separate textbook for each class, laptops might become an economical choice.
Most respondents who do not ever expect hard copies to disappear do see a diminishing need for hard copies in the future, and/or a continuing major role for both types of learning material. The following comments reflect some of the opinions of these educators.

Other technologies will continue to supplement hard-copy books and journals but not replace them.

Reference materials should make the transition before textbooks.

Hard-copy books and journals will still be around in the 21st century—and beyond. Alternative media involve internal storage in a recording device that requires another technology to retrieve it. Over enough time, the retrieval technology will become obsolete. Books will persist because they do not require any retrieval devices other than ourselves.

Lastly, eight accounting educators indicated that they thought hard-copy books and journals would be replaced by electronic media by the year 2,000. Their reasoning is reflected in the following comments:

Hard-copy journals should go the way of the dinosaur. They are a waste of time, money, and especially space. I would love to be able to download just those articles I need and forget the rest. Our library would benefit greatly from CD or network storage of journals.

Libraries will become nodes on information databases and local access providers.

You will see a major shift as faculty discover that those skilled in electronic media will generate more publications than their unskilled brethren.

I see the creation of research forums that could actually improve the ability of faculty at small institutions to be involved in current research efforts.

Are Educators Using Commercially Prepared Electronic Aids In Accounting Classes or Labs?

The results of the survey indicate that 57 percent of the respondents are using commercially prepared electronic aids in their accounting classes or labs. The most popular commercially prepared software is accounting system/general ledger software such as Peachtree. This type of program is used by approximately 17 percent of the respondents and is used primarily in
undergraduate and graduate introductory courses and occasionally in Intermediate Accounting courses. Tax preparation packages are used in tax classes by 15 percent of the respondents, and the program used most often is Turbo-Tax. Audit simulation software and videos, which are often supplied by Big-Six accounting firms, are often used in Auditing classes.

Other software that is frequently used includes database software and software supplied by textbook authors, such as tutorials for introductory accounting courses. Many educators make use of videos supplied by the Big-Six and textbook authors, and computerized practice sets and cases are also often used. A complete list of the types of electronic aids which respondents indicated they are using are included in Appendices 8 through 17.

Some courses lend themselves to the use of electronic aids better than do other courses. Electronic aids are being used most often in Accounting Information Systems, Tax and Tax Research courses, Auditing and Advanced Auditing courses, Cost and Managerial Accounting courses, and introductory accounting courses. Most respondents indicated that about ten percent of class time was allocated to the use of these aids, although most require additional student time outside of class. Some Accounting Information Systems courses are using software programs for 50 percent or more of class time.

Student reaction to commercially prepared electronic aids was reported to be favorable by 63 percent of the respondents from schools that utilized these aids. Most of the other respondents indicated that their students were ambivalent about the value of these aids. They noted that some students do well and enjoy using electronic aids, but other students "just push buttons to finish." One educator commented that for students with no previous exposure to computers, using these programs can be a frustrating and/or overwhelming experience. While some respondents reported that their students usually viewed computer exercises as "additional work," others said that electronic aids stimulate students' interest and ability, and students appreciate being able to use them.

When asked if faculty members had conducted any research to determine the impact of these aids on student interest and performance, only ten schools answered in the affirmative.

Are Educators Producing Electronic Aids for Use in Accounting Classes or Labs?

When respondents were asked how many schools had faculty members who had produced electronic aids for use in accounting classes or labs, 36 percent indicated that one or more of their faculty members had done so. The electronic aids that were produced included computerized course supplements and automated exercises, student learning aids, study guides and cases, general ledger programs, simulations, cases, tutorials, business games, and computerized exams. A complete list of the types of electronic aids that have been developed by faculty members at responding schools, and the hardware and software that was required, is included in Appendices 8 through 17.

Most of these aids were prepared for use in Accounting Information Systems courses or in introductory accounting courses, and student reaction was generally favorable to these programs.
Are Electronic Aids Provided for Accounting Students Use Outside of the Classroom?

Forty-six percent of the respondents reported that their schools were providing electronic aids (other than spreadsheets) for their accounting students’ use outside of the classroom. Most of the respondents indicated that at least some of the material they were providing was purchased from textbook authors or other commercial sources. Twenty respondents indicated that some of the material provided was prepared from scratch by their faculty members. Sixty percent of the respondents indicated students’ reactions to this material had been favorable, 36 percent indicated mixed reactions, and 4 percent indicated negative reactions.

Does The Use of These Technologies Lead to Active Student Participation or Passivity?

Forty-two percent of the respondents thought that the use of technology in accounting classes led to active student participation, and ten percent thought it promoted passivity. Forty-eight percent of the respondents felt that participation would vary, depending on the instructor, the material, and the student. Clearly the participants vary with respect to the positive answer to this question by the Arthur Andersen accounting firm strong position on this subject according to Measelle and Egol (1994).

Some of the comments made by respondents who felt that the deciding factors would be the instructor, the material, and the presentation are included below.

- Technology promotes passivity unless the instructor works to make it participatory.
- Student participation depends on how electronic aids are used. We require students to create their own aids to use in presentations.
- It depends a lot on the quality of the materials. The best materials require or permit student data analysis and interpretation in class.
- We must guard against so much fascination with the technology that the accounting content is obscured.
- When it is new, technology will promote participation. When it is older, it becomes commonplace. It will never take the place of involved, excited instructors. People will always be more important than technology.

Some of the comments made by respondents who felt that the deciding factors would be the effect of technology on different types of students are included below.
It would depend on the mode of implementation. Even with plain lecturing, some students actively participate while others remain passive.

In our classes, the computer literate are "enabled" and the non-computer literate become very passive.

This is the Sesame Street generation. Students are intrigued with multimedia equipment. Whether it is an aid to learning is still unresolved.

**Are There Some Accounting Courses or Modules That Could Be Taught Entirely By Interactive Computers?**

Sixty-three of the respondents thought that some accounting courses or course modules could be taught almost entirely by interactive "smart" computers. The majority of the respondents specified that the course which is best fitted for this type of teaching would be the introductory accounting course.

Ten respondents suggested that computerized modules could be used in all accounting courses. Their comments included the following:

I think that hypermedia, data-base oriented materials should be useful in almost all accounting classes. These materials help the student to develop problem identification skills and analysis skills, in contrast to memory work.

A lot of the "mechanical" portions of most accounting undergraduate courses could be taught in this way. The curriculum would need to be revised so that the "non-mechanical" aspects could be accommodated.

I believe nearly all of the technical material could be taught in this way. Classroom teaching would be able to focus on theory, concepts, critical thinking, problem solving, applications, etc.

Virtually all of the rules and technical aspects of our courses could be taught in this way. Then we could concentrate on helping students to understand concepts and integrating accounting with the rest of business and the world. We have taught accounting in a vacuum for its own sake, for far too long. The computer can help to free us.

Introductory courses could be entirely free from faculty and texts. Students could learn and practice at their own pace, and could take exams on the computer when ready. This would free faculty resources for more advanced courses.

Course modules or routine parts of courses could use computers, but course professors will always be needed because of the judgment and flexible communications skills needed in teaching.
Computers could be used in all courses, including theory. In fact, course continuity could be vastly enhanced by linked software. A person must be available to assist the “computer-dummies.”

Courses could probably be taught almost entirely by computers, but they should not be. Technology can help rote based material: FASBs, basic procedures, tax laws, audit standards, surveys of literature, etc., but people are necessary for reinforcement and learning.

Three respondents felt that due to differences in student attitudes and learning styles, computerized modules would be useful for only certain types of students. A typical comment was the following:

I’m open to the idea—for advanced students, but not for slower or English-as-a-second-language students.

Would the Development of Computer-Based Teaching Materials be Appropriate for Tenure and Merit Evaluations?

When asked if the extensive development of computer-based teaching materials would be considered an appropriate task for accounting faculty members as a major basis for tenure, promotion, and merit evaluations, 41 percent replied that in their opinion it would be appropriate. A similar number (39 percent) felt that this type of task should not be considered appropriate for tenure and merit evaluations, and 20 percent felt that should be considered as part of tenure evaluation, or instead should be a basis for merit raises but should not be considered in tenure evaluations.

Two respondents commented that while there have been statements indicating that this type of endeavor will be considered, tenure standards have not substantiated this claim, as these standards increasingly emphasize scholarly research. Other respondents commented that this will not be a significant factor in these types of decisions for years to come, unless the material is published and/or used outside the faculty member’s classroom.

Comments by respondents included the following:

At this campus it would not. However, there are several within the department who would like this to see this changed to should.

No standards have been developed to measure a “substantial” contribution.

The quality of teaching materials must be evaluated regardless of form.

I think it should be. As it stands today, junior non-tenured faculty would be seriously penalized for concentrating their efforts on the development of teaching material.
I think it should be, but our administration would give this short shrift since it has little public viability.

Yes, because it relates to innovative and effective teaching methods, as well as education research.

Yes, the technology is there and we need to learn to use it. This should be a valid activity for evaluation.

I do, but I doubt that university tenure committees will reward this activity in the near future.

What Percent of Your Accounting Faculty Colleagues Would Resist Using Electronic Aids in Their Courses?

When respondents were asked what percent of their accounting faculty colleagues would resist exploring the use of electronic aids and multimedia technologies in their own courses, 95 responded, and 18 of these respondents felt that none of their faculty members would resist the use of technology in the classroom. Forty-five of the respondents felt that somewhere between 5 and 50 percent of their faculty might resist, and 28 felt that from 55 to 95 percent might resist. Four respondents stated that 100 percent of their faculty would resist this change.

The reasons suggested by respondents for faculty resistance to the use of electronic aids in the classroom can be categorized as follows:

1. Fear--fear of the unknown, fear of failing.
2. Resistance to change, inertia, laziness.
3. Lack of understanding and ability.
4. The time required--start-up time, addition to work load, opportunity cost of giving up time that needs to be devoted to research.
5. Potential problems--difficulty in grading student results, potential for hardware failure.
6. Lack of funds for support personnel, hardware, software, multimedia classrooms.
7. Lack of perceived rewards in regard to tenure or merit reviews.
8. Risky--can effect student evaluations which affect merit reviews.
What is the Future of Electronically Generated Books and Journals?

About half of the schools and universities that responded to our survey indicated that they thought hard-copy books and journals would continue to play a major role after the year 2,000, but the other half of the respondents acknowledged that an increased emphasis on electronically generated reading material was inevitable. The pros and cons of this revolution, and its potential effects are discussed in the media almost daily. One of the questions newspapers are considering in making long-range plans is whether the paper will continue to print on paper, or whether news will be distributed electronically. The publisher the New York Times has commented, "As far as I'm concerned, the day we move away from newsprint is the day we cut some seven hundred million dollars out of our cost structure" (Auletta, 1993).

Textbook publishers have a large investment tied up in making and marketing textbooks that are increasingly behind the times and technology. To survive, publishers may have to prepare for titanic change. James Noblitt, head of the Institute for Academic Technology at University of North Carolina has been quoted as saying, "These days the world changes every six months and textbooks come out every three or four years. The technology is now in place to keep up with change, but textbooks can't do it" (Cox, 1993a). This is particularly true in regard to Accounting textbooks, where new FASB standards, auditing standards, and tax rules and interpretations are issued while textbooks are being printed.

Publishers are aware of this dilemma. Susan Saltrick, the director of new technology development at Wiley, notes that a tradition of giveaways has created a crippling pattern for publishers:

"The jam we've gotten into as publishers is that we still focus 90% of our attention creating these textbooks and only 10% creating software, which we basically give away to professors so they'll choose our books." (Cox, 1993a)

Many publishers expect that by the end of the decade, they will be sending the contents of their textbooks across a nationwide campus network, possibly to be printed in campus bookstores. And, as of now, no one knows how they will keep tract of copyright permissions and payments. Several educators who responded to our survey noted a concern about copyrights. One asked "What would happen to journal subscriptions if hard copies were to disappear?" and "How would editors be compensated for their efforts?"

What About User Costs and Copyrights?

Copyright problems are being considered by libraries as well as publishers. Some libraries are starting to create limitless digital bookshelves, primarily because they are running out of bookshelf space. Columbia University's law library announced recently a plan to scan and store on a super computer 10,000 deteriorating old books yearly in 1993, 1994, 1995, and 1996. This will provide enough shelf space for all of the new, copyrighted material the library gets yearly--at a far cheaper cost than a canceled plan to build a $20 million addition to house new books (Bulkeley, 1993).
The costs of receiving a lot of data over phone lines could pose problems for scholars, who are used to getting most of their information at little or no cost. Also, for the libraries, although old books and government documents do not pose copyright problems, newer books do. The Chicago-Kent School of Law at Illinois Institute of Technology, who also is storing its law library on a computer, has set up a system under which law firms can subscribe to the library for as little as $200 a year and in return can view any document on the system using computers in their own offices. If the firm wants to make their own copy, they pay the school $21 and a fee to the publisher equal to the copyright fee that would be paid if they had it copied at a copy shop (Bulkeley, 1993).

In the world of CD-ROMs, tedious copyright negotiations also are proving to be an obstacle on the way to market. Consumer demand is brisk for these compact disks that play video, audio, and text on computer screens; hardware makers are now routinely producing computers equipped to play them without attachments. In this new marketplace, however, agents for the creators are becoming highly protective of electronic rights, and the holders of electronic rights to words and images have killed some potential CD-ROM projects by making them too expensive. For example, one CD-ROM can hold the complete text and pictures of an encyclopedia, adding up to thousands of individual copyrights (Cox, 1993b).

The depth of information and cross-referencing of media that makes CD-ROMs so difficult to copyright is precisely what makes the finished product so exciting to browse. Some in the industry say the rights battles may ease as more disks are produced. "People were tremendously resistant to us a year and a half ago when we were acquiring licenses, and people put out stories about greedy Microsoft," says Ed Kelly, acquisitions manager in Microsoft's consumer division. "But we aren't trying to lock this stuff up with exclusive licenses, and (rights holders) are beginning to see this is a positive business for them" (Cox, 1993b)

How Can We Overcome Faculty Resistance to Using Electronic Technology?

Many of the respondents to our survey indicated that at least some of their faculty members would resist exploring the use of electronic aids in their courses. One solution to this problem that has been proposed is providing more workshops to help faculty obtain the expertise needed to work productively with the electronic aids that are now available.

Apple Computer and Cornell University have worked together to plan a series of workshops to facilitate the integration of technology into higher education instruction. By making technology more accessible and adaptable for faculty, Cornell hopes to increase the number of instructors who are using technology.

Indiana University-Purdue University at Indianapolis has a successful program called the Network for Excellence in Teaching (NET) (Elmore, 1991). This program helps faculty plan and develop multimedia teaching applications using emerging technologies. Many faculty members who have applied for and received NET summer stipends have restructured courses or developed new components that include multimedia applications for electronic classrooms on campus.

Another solution may be to make the task of authoring material easier for educators. Stanford University has created MAEstro, a workstation-based multimedia authoring environment that focuses on the authorship of multimedia documents (Drapeau, 1992). The goal has been to create an environment that is simple for both faculty and students to use, and which allows users to create
multimedia documents using a wide variety of media. MAEstro was first released in October, 1991, and is publicly available to anyone on Internet. In using some large authoring systems, authors must spend a significant amount of time just learning to cope with the size of the authoring system, but the MAEstro model of authorship breaks down the potentially complex task of multimedia production into smaller, simpler tasks. This enables the author to focus on the task, not the tool. Stanford hopes that this environment will encourage a new class of authors who can benefit from wide access to new media. One of the most interesting servers for technology in education is the MIT university “MIT EVAT Report-Models for the Future” at <http://www-evat.mit.edu/report/>.