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

by

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Chapter 4

Who and What? Who is Using Electronic Technology and What Are They Doing?

No one has been more wrong about computerization than George Orwell in 1984. So far, nearly everything about the actual possibility-space that computers have created indicates they are not the beginning of authority but its end. In the process of connecting everything to everything, computers elevate the power of the small player. They make room for the different, and they reward small innovations. Instead of enforcing uniformity, they promote heterogeneity and autonomy. Instead of sucking the soul from human bodies, turning computer users into an army of dull colons, networked computers --- by reflecting the networked nature of our brains --- encourage the humanism of their users. Because they have taken on the flexibility, adaptability, and self-connecting governance of organic systems, we become more human, not less so, when we use them.  

Birkerts (1994, p. 17)

Introduction

A survey of hardware and software preferences of practicing accountants is given by Khani and Zarowin (1995). In October 1992, we mailed a questionnaire to a nonrandom selection of 450 college accounting programs listed in Hasselback (1992). A copy of the questionnaire is included in Appendix 3. The programs were selected on the basis of size, prestige, and personal contacts within programs that were likely to improve the response rates for a very long, complex, and difficult questionnaire. A second appeal was sent to nonrespondents in January 1993. Numerous nonrespondents indicated that the questionnaire was not applicable to their program since virtually nothing was being authored or used in the way of hypermedia learning materials other than spreadsheets and occasional videotapes. It would seem that the overwhelming majority of nonrespondents, like respondents, are not yet using hypermedia education. The responding institutions are listed in Appendix 2. There were 111 responding institutions representing a total of 1,340 full time accounting faculty. Among the responding institutions were four Canadian universities and five universities from outside North America. Over 80 percent of the students in the responding institutions are undergraduates in four-year programs, and, therefore, learning materials for undergraduate students are likely to be of prime importance.
Many faculty members who responded have desktop computers, although the overwhelming majority of those computers appear to be older PCs and Macs that probably are not suited to upgrading for state-of-the-art hypermedia authoring. Among the 1,340 faculty, there were 1,342 computers distributed as shown in Figure 4.1. About 83 percent of the computers used are PCs, 15 percent are Macs, and about 2 percent are other types.

Figure 4.1
Computer Usage by Accounting Faculties

Word Perfect word processing capabilities are used by 745 of the responding faculty members, as opposed to 268 who use Microsoft Word, 268 who use Word Star, and 145 who use other word processors. Market share may move more toward Word for Windows due to enormous memory requirements of the new Word Perfect upgrades.
Word processing and graphics processing software utilizations are contrasted in Figure 4.2. A higher proportion of Mac users appear to use graphics processing relative to their PC counterparts.

Figure 4.2
Numbers of Responses of Faculty Using Word Processors and Paint/Photo Software

Word Processing Software

Paint, Draw, and Photo Modification Software

1 = MacPaint        7 = PhotoFinish
2 = Paintbrush      8 =
3 = CorelDraw       9 = Illustrator
4 = CAD             10 = Cricket Draw
5 = Designer        11 = Free Hand
6 = Picture Publisher 12 = Other
Whereas word processing is commonly used, graphics authoring is much less popular. Spreadsheet programs are especially popular among accounting faculty. As shown in Figure 4.3, 831 responding faculty members use Lotus 1-2-3 in comparison with 186 who use Excel and 175 who use other programs. Harvard Graphics is the most popular graphics software among accounting professors, but the number of accounting educators using any graphics program is only about ten percent of the number using spreadsheet software. This perhaps indicates that PCs are used by faculty more for research than for classroom presentations.

Figure 4.3
Numbers of Responses of Faculty Using Spreadsheet and Graphics Software

Spreadsheet Software

Graphics and Slide Show Software

The usage of CMS and hypertext/hypermedia software is almost a rare event as only 28 faculty members use Authorware, 19 use HyperGraphics, 6 use Quest, and 4 use Tencore. (These amounts are graphed in Figure 4.4.)
Figure 4.4
Numbers of Responses of Faculty Using CMS & Hypertext/Hypermedia Software

Course Management Software (CMS)

<table>
<thead>
<tr>
<th>Tool</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authorware</td>
<td>30</td>
</tr>
<tr>
<td>HyperGraphics</td>
<td>25</td>
</tr>
<tr>
<td>Quest</td>
<td>15</td>
</tr>
<tr>
<td>Tencore</td>
<td>10</td>
</tr>
</tbody>
</table>

Hypertext and Hypermedia Software

<table>
<thead>
<tr>
<th>Tool</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>ToolBook</td>
<td>13</td>
</tr>
<tr>
<td>HyperCard</td>
<td>12</td>
</tr>
<tr>
<td>SuperCard</td>
<td>11</td>
</tr>
<tr>
<td>Instant Replay</td>
<td>10</td>
</tr>
<tr>
<td>Grasp</td>
<td>9</td>
</tr>
<tr>
<td>MaxThink</td>
<td>8</td>
</tr>
<tr>
<td>Hyperties</td>
<td>7</td>
</tr>
<tr>
<td>PC-Interest</td>
<td>6</td>
</tr>
<tr>
<td>HyperWriter</td>
<td>5</td>
</tr>
<tr>
<td>Hyper PAD</td>
<td>4</td>
</tr>
<tr>
<td>Owl's Guide</td>
<td>3</td>
</tr>
<tr>
<td>Others</td>
<td>1</td>
</tr>
</tbody>
</table>

Number of Responses
There were 23 purported users of ToolBook with 13 using the multimedia version. HyperCard for Mac systems followed closely in the amount of usage with 19 users. This is a small proportion out of the 1,340 total accounting faculty members who responded to the survey. Usage of alternative software programs are shown in Figure 4.4. It seems that members were using hypertext and hypermedia authoring at the close of 1992. In contrast, many more faculty members were using computers for research analysis and statistical processing. These relationships are graphed in Figure 4.5. There were 117 faculty members out of a total of 1,340 who “regularly” utilize monochrome LCD

Figure 4.5
Numbers of Responses of Faculty Using Programming and Statistics Software
Statistical Analysis Software

- SAS: 350
- SPSS: 300
- BMD: 50
- MicroStat: 20
- Stat View: 10
- Others: 10
panels for classroom projection of computer screens. Color LCD panels are similarly used by 93 faculty, and 59 accounting faculty use electronic classrooms (we did not explicitly define what qualified as an "electronic classroom" for this question). These results are summarized in Figure 4.6.

Figure 4.6
Numbers of Responses of Faculty Using Classroom Projection Images

![Figure 4.6 Classroom Screen Projection Hardware](image)

![Figure 4.6 Number of Responses of Faculty Using Multimedia](image)
Learning Materials Authoring by Accounting Faculty

What intrigued us most were the responses indicating 51 faculty make "multimedia presentations" (46 multimedia PC presenters, 6 multimedia Mac presenters, and 2 presenters using other computers). We did a follow-up survey of those 51 respondents using a follow-up questionnaire that was much more explicit as to usage of videodiscs, CD-ROMs, audio files, full motion video files, and other forms of multimedia. Most of the multimedia professors were using only videotape and computer projections.

Authoring of CAL materials in hypertext, hypermedia, and CMS areas is much less widespread than authoring of spreadsheet and electronic slide show aids. As a result of the encounters of one of the authors (Jensen) in presentations at nearly 100 universities of his dog and pony show on how to author hypermedia learning materials and record them on desktop CD-ROM recorders, we can provide a sampling of the types of efforts being made by various individuals around the world. These campus visits afforded him an opportunity to inspect campus facilities and make inquiries as to what type of electronic CAL materials were being developed both in accounting programs and other programs on campus.

In conferences and elsewhere both authors have repeatedly asked about what developments are taking place among accounting faculties. In almost every instance professors report little development work (other than spreadsheets and classroom computer slide shows) taking place in learning materials for accounting and other business programs. In contrast, various other programs on nearly all campuses are doing hypermedia development work, particularly in the natural sciences where data visualizations are especially important to learning. This finding was consistent with the Jensen and Sandlin (1992a, 1992b) earlier findings indicating that accounting faculties are lagging behind other disciplines in research and development of CAL materials. Although most campuses now have some electronic classrooms, our results indicate almost little or no availability to accounting faculty at present. Various programs report that electronic classrooms are soon to be developed in classrooms presently used by accounting. Others report planned acquisitions of portable equipment such as multimedia cart computers and LCD panels for video and computer classroom projections. Conversions of student computer labs into hypermedia labs seem to be progressing at much slower rates on college campuses. Electronic classrooms, campus networks, and hypermedia computer labs hopefully will stimulate more hypermedia development work by accounting educators.

Our travels have also put us in contact with publishing companies and public accounting firms. All of the Big Six accounting firms are anticipating radical changes in training programs, including changes that may ultimately do away with hard-copy training materials and some travel to training sites. Accounting firms tend to be well ahead, at present, of universities in plans and efforts to put CAL course materials into multimedia computer platforms that can be delivered in employee homes and local offices.
Possible uses of the Internet by practicing accountants and some interesting site addresses are given by Cohen (1995). New academic accounting services on the Internet include the following:

**ANet** = The International Accounting Network, Southern Cross University, New South Wales, Australia and Bond University, Queensland, Australia. The email address is ANet@scu.edu.au. A description of services is contained in the CETA Newsletter, June, 1994. Mailing lists are also available on ANet, including CDI-ACC-AUDIT in the United Kingdom and AC-CHANGE from Maricopa College in Arizona.

Date: Tue, 27 Jun 1995 22:49:43 +1000

>From: Mr Background <daemon@scu.edu.au>

>Over the last few months, we have added a number of new services to ANet. I thought it would be worthwhile to send all ANews-L subscribers a copy of the latest version of our help file which goes out in response to an email to:

  > anet@scu.edu.au

>Please copy this for your colleagues. Roger Debreceny

>Introducing ANet Introducing ANet Introducing ANet

> Part Of The International Accounting Network

>INTRODUCTION

>The "ANet" is a co-operative venture of a number of individuals and academic institutions around the world. It seeks to provide a networked, electronic forum for the exchange of information and the discussion of issues in the broad Accounting and Auditing disciplines.

>It is also envisaged to be a repository for a range of information in the disciplines. It includes a variety of electronic mail discussion groups and an online database of information.

>ANet is centered at Southern Cross University (SCU) in New South Wales, Australia. The Director of ANet is Roger Debreceny of the Center for Accounting and Finance in the Faculty of Business and Computing at the University in co-operation with the School of Business at Bond University.

>He is assisted by Phil Shepherd of the Computer Centre and Cathy Munro and Mitch Adermann at SCU and by the following associates from universities in Canada, New Zealand, the United States, United Kingdom, the Netherlands and Australia.
ANet is also supported by the sharing of information by the American Accounting Association and it is expected that similar arrangements will be made with like organisations in the near future.

ANet co-operates closely with the Summa project at the University of Exeter and is keen to work with all similar ventures in the accounting and auditing disciplines.

ANet is in the final stages of instituting an international advisory board, to guide its development. The Board will be chaired by Professor Ted Mock of the University of Southern California.

OBJECTIVES

The objectives of ANet are:

- To provide a variety of information services to members of the accounting community worldwide and particularly members of the academic community.

- To provide a range of services at no cost to users and to maintain those services in the public domain.

- To foster scholarly debate in the accounting discipline.
> To provide a vehicle for individuals and organisations to provide network access to existing information sources.

> To encourage the development of other information services in the accounting community.

> To foster knowledge and acceptance amongst the accounting community of the benefits of using international electronic networks.

> To bring accounting students together via the networks. And

> To foster electronic publication of scholarly inquiry on the networks.

> THE ANET MAILING LISTS

> INTRODUCTION

ANet maintains a number of mailing lists on both broad and narrow areas of the discipline. A mailing list is maintained by software which manages the conversation between participants on the list, maintains a record of the discussion and allows participants to sign up for a particular discussion group or drop themselves from the list as they desire.

Communicating with the list software:

To subscribe to any mailing list, send a message to the following e-mail address of the mailing list management software:

> listproc@scu.edu.au

With the following text in the body of the e-mail:

> subscribe name_of_the_list your_first_name your_surname

So for example if Luca Pacioli wished to subscribe to the accounting history mailing list, AHistory-L (see below for details) he would send a message to

> listproc@scu.edu.au

with the following text in the body of the message:

> subscribe AHistory-L Luca Pacioli

The software has a number of features and a simple message to listproc with the text:

> help

will return information on the features of the software.

Archives:
An archive is held on all mailing lists so that a record of the conversation can subsequently be retrieved. The archives will be able to accessed by e-mail using the ListProc list management software, or on line using the ANet WorldWideWeb.

Management of the mailing lists:

While the lists are centralised at Southern Cross University, management of a given list can be undertaken from anywhere in the world. Wherever possible, between one and three moderators moderate a mailing list to ensure that appropriate "netiquette" is followed by participants and that the mailing list is supplied only with material relevant to that mailing list.

In addition moderators are expected to keep the list supplied with information and discussion points relevant to the list domain. The work of the moderator is not demanding - email to Roger Debreceny at ANetAdm@scu.edu.au for further information.

Additional mailing lists can be established for any area of the discipline no matter how narrow. Some of the best lists are for only a handful of academics who are interested in a particular research or teaching paradigm. Send e-mail to ANetAdm@scu.edu.au to request the establishment of a list.

DESCRIPTION OF THE MAILING LISTS:

The following lists are currently in operation and others will be added as demand warrants:

ANews-L - News Name: ANews-L Moderator: Roger Debreceny, Southern Cross University E-mail: rdebrece@scu.edu.au Objectives: A low volume but high quality mailing list which will concentrate on news of journals, conferences, seminars and other matters of interest to the academic accounting community. If you wish only minimal contact with ANet, subscribe to this "news only channel". It will be like CNN Headline News except only coming once a fortnight, not every half hour :)

Comment: This mailing list will be uni-directional. Any information posted to a-news will be incorporated into a single digest which will be posted approximately each two weeks.

AAATC-L - American Accounting Association Teaching and Curriculum Section Newsletter Name: AAATC-L Objectives: The American Accounting Association Teaching and Curriculum Section Newsletter list. Note: There is no discussion on this list. Comment: A moderated and open list.

AAccSys-L - Accounting Information Systems Name: AAccSys-L Moderator: Mark Asman, Bowling Green State University Email: masman@andy.bgsu.edu Objectives: To discuss all matters
concerned with accounting information systems theory and practice. Comment: A moderated and open list.

>AAccWeb-L - Accounting Web Development - Closed Name: AAccWeb-L Moderator: Roger Debreceny, Southern Cross University Email: anetadm@scu.edu.au Objectives: A closed list for ANet and other developers of a multinational, multi-institutional WorldWideWeb server of accounting information. For further information contact Roger Debreceny (ANetAdm@scu.edu.au) Comment: A closed list.

>AAcrdn-L - Accreditation of accounting programs Name: AAcrdn-L Moderator: Roger Debreceny, Southern Cross University (temporary) Email: anetadm@scu.edu.au Objectives: A closed list for ANet and other developers of a multinational, multi-institutional WorldWideWeb server of accounting information. For further information contact Roger Debreceny (anetadm@scu.edu.au) Comment: An open and moderated list.

>AAudit-L - Auditing Name: AAudit-L Moderator: Ray McNamara, Bond University E-mail: rpm@milton.bus.bond.edu.au Objectives: A list to discuss all aspects of external and internal audit. Comment: A moderated and open list.

>ABooks-L - New Books Name: ABooks-L Moderator: Roger Debreceny E-mail: rdebrece@scu.edu.au Objectives: A mailing list which allows authors and publishers to advertise the arrival of new books in the discipline. Comment: Be warned - unashamed advertising allowed in this mailing list. A moderated and open list.

>AEthics-L - Ethics Name: AEthics-L Moderator: Earl Hall E-mail: earl@eskimo.com Objectives: A list to discuss the ethical dimension of accounting and auditing. Comment: A moderated and open list.

>AEthnog-L - Accounting Ethnography Name: AEthnog-L Moderator: Steve Smith, West Virginia University, E-mail: SMITHG@WVUBE1.BE.WVU.EDU Moderator: Dr Kamran Ahmed, Victoria University of Wellington, NZ Email: kamran.ahmed@vuw.ac.nz Objectives: A list to discuss the ethnographic dimension of accounting and auditing. Comment: A moderated and open list.

>AFinAcc-L - Financial Accounting Name: AFinAcc-L Moderator: Keith Duncan, Bond University, Australia E-mail: kduncan@pcmail.bond.edu.au Moderator: Earl Hall E-mail: earl@eskimo.com Objectives: A list which will discuss all aspects of financial accounting.
AGvNFP-L - Governmental and Not-for-Profit Accounting

Name: AGvNFP-L
Objectives: A list to discuss government and not-for-profit accounting issues. Moderator: Dr Jim Kurtenbach

AHistory-L - Accounting History

Name: AHistory-L
Objectives: A list concerned with the discussion of accounting history.
Comment: A moderated and open list.

AIntAcc-L - International Accounting

Name: AIntAcc-L
Moderator: Ian Eddie, University of New England, Australia
E-mail: ieddie@metz.une.edu.au

Moderator: Shalin, University of Otago, NZ
E-mail: SHALIN@commerce.otago.ac.nz
Objectives: This list will discuss all aspects of international accounting.
Comment: A moderated and open list.

AIntSys-L - Intelligent and Expert Systems

Name: AIntSys-L
Moderator: Dr Thomas Verghese, The George Washington University, USA
E-mail: TOMMY2@gwuvm.gwu.edu

Moderator: Dr Maartens Gelderman, Netherlands
E-mail: M.=Gelderman%Staf%EconVU@ecu.econ.vu.nl
Objectives: A mailing list which discusses the application of intelligent and expert systems to accounting and management.
Comment: A moderated and open list.

AJobs-L - Academic Positions

Name: AJobs-L
Moderator: Roger Debreceny
E-mail: rdebrece@scu.edu.au
Objectives: This list will carry academic job announcements. Comment: A moderated and open list.

AMgtAcc-L - Management Accounting

Name: AMgtAcc-L
Moderator: Prof Anthony Atkinson, University of Waterloo
E-mail: aatkinso@watarts.uwaterloo.ca
Objectives: The management accounting list. Comment: A moderated and open list.

ANetDev-L - ANet Network Development (Closed)

Name: ANetDev-L
Moderator: Roger Debreceny, Southern Cross University, Australia
E-mail: rdebrece@scu.edu.au
Objectives: This list will discuss the development of the ANet and is particularly designed for moderators and those involved with the management of the network. Comment: This list will be closed.

AOilAcc-L - Extractive Industries

Name: AOilAcc-L
Moderator: Robert Luther, University of Exeter
E-mail: R.G.Luther@exeter.ac.uk
Objectives: This list discusses accounting for extractive industries, including oil and gas.

AProfsn-L - Academic/Profession Interface

Name: AProfsn-L
Moderator: Hubert Glover, Clemson University, USA
E-mail: ghubert@clemson.edu
Objectives: This list will discuss the nexus between academia and the accounting and auditing profession with particular emphasis on improving the
relationship and co-operation between the two elements. Comment: A moderated and open list.

> ARes00-L through ARes08-L - Research Lists Name: ARes00-L
Moderator: Roger Debreceny E-mail: rdebrece@scu.edu.au
Objectives: ANet as a service to the accounting community provides a number of lists that academic accountants can use to further group research activities.

> ASocial-L - Social Accounting Name: ASocial-L
Moderator: Roger Burritt, Australian National University E-mail: burrcomm@durras.anu.edu.au
Objectives: This list will discuss all aspects of accounting in its behavioural and sociological context. Comment: A moderated and open list.

> AStdnt-L - Accounting Student List Name: AStdnt-L
Objectives: This list enables student to student contact around the world. Comment: An unmoderated and open list.

> ATax-L - Taxation Name: ATax-L
Moderator: Sharon Lassar, Florida Atlantic University E-mail: lassar@acc.fau.edu
Moderator: Rick Robertson, Western Business School, University of Western Ontario E-mail: RROBERTS@novell.business.uwo.ca
Objectives: A list to discuss all accounting and other tax related issues.

> ATeach-L - Teaching and Learning

**International Internet Association** = an Internet service that may be accessed for a fee under instructions given at phone number 813-923-4093. American Accounting Association members may access a free AAA bulletin board by phoning 813-923-4093.

**PIC-AECM** = Pacioli International Centre for Accounting Education using Computers and Multimedia, Loyola College in Maryland, 4501 North Charles Street, Baltimore, MD 21210-2699 Phone: (410-617-2478). Fax: (410-617-2006) email: pacioli@Loyola.edu. The AECM-L mailing list is also available. A description of services is contained in the CETA Newsletter, June, 1994.

Date: Fri, 07 Jul 1995 07:34:21 -0500 (EST)

> From: "PMDF Mailserv V4.3" <mailserv-reply@LOYOLA.EDU>

> Subject: Welcome to AECM-L

> To: "Robert (Bob) Jensen" <RJENSEN@tucc2.tucc.trinity.edu>, RJENSEN@tucc2.tucc.trinity.edu

> Welcome to AECM-L! You may want to save this for later reference.
AECP stands for "Accounting Education using Computers and Multimedia".

This list/interest group provides a forum for discussions of *all*

 hardware and software which can be useful in any way for accounting

 education at the college/university level. Hardware includes all

 platforms. Software includes spreadsheets and related templates,

 practice sets, multimedia authoring and presentation packages, data

 base programs, tax packages, instructor-developed applications, etc.

 Loyola College in Maryland, which has an AACSB-accredited

 accounting program, serves as the host to the list which was established in

 February, 1994. It is the first list/group for accounting education on

 either Bitnet or Internet and has over 500 members in 25 countries.

 AECM-L provides an unmoderated environment where issues, questions,

 comments, ideas, and uses of educational accounting software and

 related hardware can be freely discussed. As is the case on all

 unmoderated lists, the topics and discussions are only limited by the

 imagination and interest of its subscribers. Members are welcome to

 take an active role by posting to AECM-L or an inactive role by

 monitoring the list. Unlike many lists which suggest that new

 subscribers introduce themselves to the group, we believe that such

 postings are primarily social and *not appropriate* for this list.

 This list was conceived to bring together accounting faculty, authors,

 developers, publishers and anyone else with an interest in using

 computers and multimedia in accounting education. Subscribers are

 encouraged to ask questions, share ideas and information, and discuss

 the good and bad experiences they have had with various educational

 accounting software and hardware products. Please try to be
> *innovative, creative and open minded*. Possible topics include:
> 
> - Computer applications in managerial/systems/tax etc.
> - AECC curriculum revisions and computer-based pedagogical approaches to support these changes
> - Notable educational accounting software and hardware, as well as inferior products one should avoid
> - Information about related conferences, workshops and seminars
> - A discussion of articles, books, and notes which subscribers have found stimulating and worthwhile
> - "What's the best software to use for my [blank] course?"
> - "In what direction is educational accounting software evolving?"
> - "How can I get [product] to do [function]?"

> *IMPORTANT* - Mail sent to the list/group must be addressed to:
> AECM-L@LOYOLA.EDU (Internet users) or AECM-L@LOYVAX.BITNET (Bitnet users)

> *All* mail sent to an above address will be automatically forwarded to all list/group subscribers. If you reply to a question, observation, etc. using the REPLY command, your response will also be forwarded automatically to all subscribers. If you wish to respond privately to the original sender, you must locate that person's address on the "From:" line of the mail header and address the response directly to them.

> [The rest of this welcome is rather technical. If it doesn't make sense, don't be concerned.] This list is *NOT* LISTSERV-based. In contrast to the majority of BITNET lists, this one is maintained on a DEC VAX running PMDF's MAILSERV software. Consequently, certain administrative commands are slightly different than those used by
LISTSERV. MAILSERV supports the following commands, among others:

- HELP - Ask for the HELP file.
- SUBSCRIBE - Subscribe to a list.
- UNSUBSCRIBE - Unsubscribe to a list.

MAILSERV accepts only mail messages, not interactive SENDs or TELLs. As an example, to unsubscribe to the AECM-L list, send a mail message to:

MAILSERV@LOYOLA.EDU

and in the body of the message put only the command:

UNSUBSCRIBE AECM-L

(Notice that you don't need to give a subscription name or address; MAILSERV gets them from your E-mail.)

Questions regarding this list should be addressed to the owner:

E. Barry Rice, Director, PIC-AECM
Pacioli International Centre for Accounting Education using Computers and Multimedia

E-Mail: Rice@Loyola.edu (or) S-Mail: Loyola College in Maryland
Pacioli@Loyola.edu 4501 North Charles Street
V-Mail: 410-617-2478 (Office) Baltimore, MD USA 21210-2699
410-486-1920 (Home) FAX: 410-617-2006

RAW = Rutgers Accounting Web informational retrieval system (funded with a grant from NCAIR) for a variety of free materials for accounting educators. The main purpose of the system is to share materials developed in connection with the Accounting Education Change Commission (AECC). Materials include lectures, cases, assignments, examinations, syllabi and course outlines, and reports of projects at various AECC sponsored sites. The World Wide Web address for the Lynx program is for text only is <http://www.rutgers.edu/Accounting/raw.htm>. Lynx only transfers text, For graphics, a Mosaic option is available. Contact Professor Alex Kogan, Accounting and Information Systems, Faculty of Management, Rutgers University, 180 University Ave., Newark, NJ 07102-1905. Phone: 201-648-1064 and Fax 201-648-1283 and email kogan@andromeda.rutgers.edu
Both networks are intended to be aids for world wide network communications among accounting educators.

Some of the following individuals may share their CAL materials and authoring experiences with interested readers:

- Professor Don B. Smith at Wilfrid Laurier University in Canada has spearheaded an innovative Visual Basic set of Windows CD-ROM modules and cases for student learning of basic accounting. An important feature is the widespread use of audio feedback to student interactive choices. Another feature is the ability to easily customize the materials to fit alternate basic accounting textbooks and instructor preferences. The materials are designed mainly for self-directed learning in computer laboratories having audio capabilities on each PC.

- Professor Meg Dwyer at the University of Wisconsin-Eau Claire has authored auditing and systems materials using a PC computer with a sound board, video board, videodisc, and VCR.

- Professor Larry Ozzello at the University of Wisconsin-Eau Claire has authored some multimedia materials for a course entitled Consolidated Statements, but the material appears to be primarily authored in Harvard Graphics and spreadsheet software rather than hypermedia software.

- Professor Janet Butler at the University of North Carolina at Greensboro is developing Multimedia ToolBook presentations for a course entitled "Transactions Processing Systems."

- Professor Clinton White at the University of Delaware has authored some HyperCard Mac learning materials for an accounting course entitled Systems Analysis and Design.

- Professor Ed Blocher at the University of North Carolina at Chapel Hill reports using a Coopers and Lybrand hypertext case developed by Coopers and Lybrand.

- Rick Birney is doing an extensive ToolBook (but not Multimedia ToolBook) project for basic accounting computer labs at Arizona State University. The lead professor for these lab courses is Ralph Smith. This is an extensive project that includes tracking of student progress and computer examinations. The lab course is available from McGraw-Hill and described in CETA Newsletter, November 1993, p. 4. See Appendix 1 under McGraw-Hill for the Birney and Birney and Smith electronic books available in Asymetrix ToolBook software.

- Professor Robert E. Jensen at Trinity University has over 1,000 hours of HyperGraphics course materials for basic accounting, managerial accounting, and accounting theory courses. He has also developed extensive Multimedia ToolBook course materials that utilize audio and full motion video files. He is also extending selected corporate annual reports into multimedia annual reports which are recorded on CD-ROM discs at his desktop. Three ToolBook projects in process are Accounting Careers CD-ROM, Accounting Controversies CD-ROM, and Accounting Cases CD-ROM.

- Barry Rice at Loyola College in Maryland is using Multimedia ToolBook authoring with student response pads for accounting applications. These response pads are actively used by accounting faculty and students at Loyola.
A new Center for Educational Technology in Accounting has been formed at the University of North Texas under the direction of Professor Robert Michaeelsen. At the time of this writing, the Center is just getting started in generating hypermedia learning materials for accounting. CETA distributes a free newsletter called CETA Newsletter (Contact Professor Robert H. Michaelson, Director of Center for Education Technology, College of Business Administration, University of North Texas, Denton, TX 76203-3677).

Atamian (1994) describes how he teaches accounting courses in students no longer use paper and the instructor no longer distributes paper for readings and assignments. Instruction is via computers with extensive use of email. Examinations are also given on computers.

George Bodnar (412-766-2840 or bodnar@duq3.duq.edu) of Duquesne University has authored a basic accounting practice set and Windows bookkeeping system called Omins Mus. The system is reasonably priced at $6 per student. The system is easy to install and is quite user friendly. It is designed for the paperless basic accounting courses and can be used in higher level courses as well.

The National Center for Automated Information Research (NCAIR) makes technology grants for education in accounting and law. The following projects in process at the present time were funded by NCAIR:

- John Everett (Virginia Commonwealth) and Richard Boley (University of North Texas), "Comprehensive Classroom Cases Emphasizing Computer Usage in Contemporary Tax Practice," $55,400.
- Glen Gray and L. Richard Lee (California State University at Northridge), "Developing and Evaluating a Self-Monitoring Intelligent Tutoring System for Accounting," $49,200. This project is now completed and can be obtained by contacting Professors Gran and Ye. See Gray (1994).
- Groomer (Indiana University at Bloomington), "A Proposal to Develop a Course on the Utilization of Data and Technology to Solve Business Problems," $44,000.
- Alexanter Kogan et al. (Rutgers University in Newark), Organizing and Disseminating Accounting Education Change Materials through the Internet," $62,475.
- James Parker (University of Missouri at Columbia), "Research-Based Development of Instructional Tax Materials," $26,600.
- E. Peacock (Oakland University), "Developing an Accounting/MIS Curriculum Using computer Aided Systems Engineering (CASE) Methodology," $80,609.
• Paul Watkins (University of Southern California), "Feasibility of Distributed Interactive Multimedia Educational and Decision Support Computing Via Client-Server Networks," $37,000.

• Professors at The University of Northern Iowa (UNI) have conducted a two-year effort leading to a paperless classroom for instruction in accounting and finance at the UNI according to Wyatt and Heian (1994). By using computerized spreadsheets to facilitate concept/technique presentation and examinations, these educators feel that the rigor of the course material has been increased while the per student labor intensity of evaluation has been decreased. A by-product is that students gain mastery of spreadsheets by using them to resolve test problems. In addition, the use of this testing tool enhances students' ability to deal with real-world complexity rather than using simplified data. The computerize testing uses complex multi-step-to-solution problem and databases. Students and instructors must learn to manage detail rather than avoid it for lack of time or sufficiently powerful computational tools.

• David Foster at Northwestern University describes in Foster (1995) how students learn to analyze financial statements in “learning by doing” simulations of lending decisions of a bank analyst using goad-based scenarios in interactive learning scenarios. This combines multimedia with artificial intelligence.

• Harvard Business School Publishing (HBSP), Boston MA 02163 (800-545-7685) is most noted for its hard copy publishing of cases and journals. HBSP has gone somewhat high tech with CD-ROM cases and catalogs listed on the Internet. Most CD-ROM options, unfortunately, do not include hypertext or hypermedia animations, audio, and video segments. The Gopher address is CATALOG@HBSCAT.HARVARD.EDU and the Telnet address is HBSCAT.HARVARD.EDU. Email may be addressed to HBSCAT@CCHBSPUB.HARVARD.EDU. The catalog is also available on floppy disc.

• Course Technology, Inc (800-648-7450) offers the first multimedia Harvard Business School CD-ROM entitled “Managing International Business” that includes, among other things, cases by Harvard’s Christopher A. Bartlett and INSEAD’s Sumatra Ghoshal. The CD-ROM version includes video, audio, animated graphics, and text. An instructor’s Resource Kit and free demonstration video are available. The hypermedia case disc allows students to record their own comments in a word processor and spreadsheets. See Appendix 1 for further details.

• European Case Clearing House (ECCH), Cranfield Institute of Technology, Beds, MK43 0AL, United Kingdom (also at Babson College in Babson Park, Wellesley, MA 02157). The ECCH now offers an on line network server for international cases. Although none of the cases are, as yet, in hypertext or hypermedia format, it is a useful feature to have cases available for file transfer on the Internet.

• Price Waterhouse in England developed some high quality videodisc applications worthy of note for training purposes. These are entitled Risky Business and Account Ability. See Appendix 1 for further details. Some accounting firms are also selling CD-ROM training programs. Examples include the Price Waterhouse FAS 109 Learning the Less Taxing Way and Tax Foundations: How to Audit Corporate Tax Provisions selling on CD-ROM for $1,000 each.

• Some accounting professors have developed and/or have used HyperGraphics courseware. Examples include Linda Frye at Northwest Missouri State University, Joan Conrad at Dalhousie University (Canada), Mary Oliverio at Pace University, Edward Goodhart at Shippensburg University, Philip Karpik at Butler University, Kari Lukka at Turku School of
An active author of Mac hypermedia accounting classroom materials is John W. Buckley at UCLA. Professor Buckley is featured in the Apple Corporation promotional video entitled "The Macintosh Lecture Advantage."

Glenn E. Owen (805-733-3480) at the University of California at Santa Barbara has extensive Mac spreadsheet supplements in Excel for intermediate accounting. The material comes in three volumes and includes "real-world" applications. The applications are profiled along with two Mac business administration profiles (Wharton, Georgia Tech) in the May/June 1993 issue of *Syllabus*, pp. 11-12.

Robert Kravet and Roselie Kenney at Fairfield University have a spreadsheet cost accounting application linked with videotapes.

Indiana University at Bloomington actively uses student response pads and CAL materials in accounting courses.

Ann B. Pushkin is developing auditing course material in ToolBook. She is located in the College of Business and Economics, West Virginia University, Morgantown, WV 36506-6025.

Eight Wharton professors under the direction of Kendall Whitehouse (215-898-2742) at the University of Pennsylvania are participating in a HyperCard pilot project to transform overhead transparencies into random access computer projections. A typical application includes scanned images (e.g., advertising copy) and digitized audio such as short takes from commercials. Georgia Tech (404-894-2000) has a School of Management "Classroom 2000" equipped with 35 Mac II computers that are used in a variety of applications, especially data analysis, forecasting, and other econometric applications.

New York University School of Continuing Education in 1991 commenced a comprehensive "Virtual College" computer network education service that will provide instruction in a wide range of courses in a comprehensive curriculum, conduct examinations, monitor course projects, and field inquiries from students virtually anywhere in the world. The coordinator of auditing instruction in the Virtual College is presently Professor Richard Vigilante. A Virtual College internal auditing curriculum is now available for practitioners around the world. The Virtual College has four modules termed Student (course discussions, project development, email, cafe discussions, student newspaper, course evaluations), Faculty (curriculum, grading, course production, email, research support, committee support), Library (course hypertexts, case study materials, reference books, journal articles, audio/visual materials, on-line database gateway), and Administration (student inquiries, admissions, registration, transcripts, CPE certifications, faculty records, alumni records) modules. Learning materials include Lotus Notes and databases of various types. To our knowledge, no on-line hypermedia learning materials are yet available on either networks or CD-ROM discs. There are,
however, television and teleconferencing education courses available in 85 countries. For example, a
16-credit Advanced Professional Certificate (APC) package is now available for information systems
auditing.

The College of Business Administration at the University of Notre Dame has leading state-of-the-
art facilities in terms of building, networking, electronic classrooms, and computer laboratories. The
dedication of its accounting and business faculty to employing this technology both on campus and in
lifetime learning is stressed in Garland et al. (1992).

An increasing number of professors are using CAL supplements provided with textbooks such as
those supplements listed in Appendix 1. Common uses are made of accounting system software,
spreadsheets, databases, computerized practice sets, computerized CPA review courses, Marina-Ivy
Software, TurboTax or related packages, and others. Greg Stoner at the University of Glasgow uses
the Price Waterhouse Multimedia System on Accountability. Kevin Misiewicz at Notre Dame likes the
Coopers and Lybrand Combo of accounting and auditing cases. The Coopers and Lybrand
"Excellence in Audit Education" simulation case entitled Dermaceutics, Inc. won an EDUCOM Higher
Education Software and Curriculum Innovation award and are widely used in colleges and
universities. Dermaceutics is an audit risk assessment and audit planning simulation. Databases are
provided to simulate daily reading and the study of client financial records. The case also has a
"solutions" videotape.

Somewhat regular (every four years) conferences called Trends in Computerized Accounting
Education Conference (TCAEC) commenced in 1990 and are held in early June at Loyola College,
4501 North Charles Street, Baltimore MD 21210-2699, Phone: 410-617-2474 and Fax: 410-323-
2768. These are two day conferences with additional workshops for added fees. To date, the
workshops tend to be quite elementary on such topics as "Beginner Windows," "WordPerfect for
Windows", "OS/2," "Beginner and Advanced Spreadsheets," Database,: and "Macintosh
Applications." In 1994, a workshop will also be available on "Multimedia/Interactive Presentation
Technology." Loyola also will demonstrate its "Classroom of the Future" that contains interactive
keypads, motion video editing facilities, and multimedia playback. There are also vendor exhibits and
demonstrations of more than 75 educational software packages. For details contact Barry Rice (410-
617-2478) or John Guercio (410-617-2593). Barry Rice prefers Multimedia ToolBook authoring of
accounting lessons for classrooms equipped with student response pads.

Although the multimedia applications in Delta Project tend to be more for business JITT than
business education, the Delta Project should be mentioned at this point. This is a European
Economic Community (EEC) funded project of the Commission of European Communities. With a
budget of over $100 million, this is probably the world's largest attempt to apply modern technologies
to distance training and education. Partners in the project include major universities,
telecommunications companies, and business firms of all sizes across the EEC. Collis and de Vries
(1994) report on 27 major projects with over 300 sub-projects in network education and multimedia
development. All students in the Executive MBA Program at UCLA have Macintosh PowerBooks and
are required to make extensive use of the university network according to Syllabus HEPC,
July/August 1994, p. 20. In that same issue on Page 22, it is reported how Cornell University is using
an NSF grant to develop Mac and PC software for video conferencing over the Internet.

Applications in Other Areas of Business
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Although most presentation applications are designed for in-class use, the Smeal College of Business Administration at Penn State University has a unique and very extensive computer lab/networked set of MBA learning modules using Harvard Graphics software. For a review, see T.H.E. Technological Horizons in Education, May 1995, p. 59.

**Conclusions**

Accounting professors are extensively using computers in research and in generating classroom materials. However, authoring is confined largely to word processing, spreadsheets, and statistical analyses. Many like Paquette and Schwarzbach (1991) are using financial databases on CD-ROM discs. Spreadsheets and databases are now available from publishing companies are listed in Appendix 1. Other than spreadsheets, most accounting faculty are not authoring CAL materials for classrooms and labs. A large proportion of the CAL materials used in classrooms is comprised of material made available by publishers and CPA firms (see Appendix 1). As of December 1992, there were virtually no videodiscs or hypermedia CD-ROMs available for classroom accounting teaching in accounting, although some forthcoming in 1994 are listed in Appendix 1. Commercial CAL materials up to that point in time were largely computer databases and spreadsheet programs of one type or another.

Hypermedia authoring by accounting professors is almost nonexistent. DeLoughry (1993b) reports that, in a large University of Southern California survey having 995 responses from two- and four-year colleges and universities, development of instructional software and other Computer-Aided Learning (CAL) materials for students is given "low priority" in virtually all other academic disciplines. This survey is reviewed in Syllabus, November/December 1993, 0p. 24-25. The survey results show a strong demand for the technology but little involvement in using it or authoring learning materials in newer technology. In our viewpoint, the major reason is the low priority given in general to learning materials development and particularly to CAL materials development in tenure, promotion, and merit evaluations in colleges around the world. Lack of support facilities in faculty offices, classrooms, and student labs are also problematic. These points were made repeatedly by respondents to our own survey and are discussed in Chapters 4, 5, and 6. 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/>.
We close this chapter with a quotation from two economics professors who, in studying applications of technology in economics education in the United Kingdom, came to essentially the same conclusion that we find in accounting and business studies:

Whilst there is a great potential for the use of computer-assisted learning in economics, this has yet to be exploited. Although researchers are making increasingly sophisticated use of computers in their work, a great deal of the teaching using computers lacks an innovative approach. Computer-assisted learning will not provide a panacea for addressing the questions of increasing student numbers, a growing body of knowledge and declining real resources. However it can contribute in a significant way to providing a variety of learning experiences for economics students. By this measure many economics lecturers are failing their students. (Emphasis added) Hobbs and Judge (1992, p. 71)