

# Chapter 8

## WEB-BASED INFORMATION MANAGEMENT: DEVELOPING A 21st CENTURY CAREER

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The purpose of this chapter is to discuss the main factors that should be considered when integrating computer technology into an academic career and to identify sources of assistance for doing so. It is imperative that tax educators consider these factors, understand their institution's computing environment, and articulate objectives before investing significant resources in a resource-hungry integration process.

The emphasis of this chapter is on devising a feasible strategy and selecting the appropriate supporting tools for developing, delivering, and maintaining web-based information. This chapter is intended to help tax educators appreciate the infrastructure that supports the learning tools discussed in other chapters of the monograph. This chapter is also intended to provide an understanding of the design and implementation process and choices, and an appreciation of computer technology's potential for effectively and efficiently managing information about career and course activities.

### THE TECHNOLOGICAL IMPERATIVE

There are many decisions to make when considering the integration of information technologies into the academic enterprise. The market for education has already made the first decision: 21st century educators will use computers to compile and deliver interactive learning materials (Office of Educational Technology 1995, <http://www.ed.gov/Technology/Futures/>). The consequent related decisions are certainly numerous, probably confusing, and potentially overwhelming. The process requires significant resources to simultaneously integrate computer-mediated learning tools into the curriculum *and* into a system of networked computers. The output must enhance learning and career outcomes.

This chapter focuses on the important considerations and constraints that tax educators need to evaluate when devising a strategy for integrating computer technologies into 21st century career activities. The sections that follow start with a description of the key elements of the computing environment, including the:

- technology's potential
- institutional and individual objectives
- audiences and information demands
- resource considerations and constraints

This material is followed by a description of the process of developing, delivering, and maintaining computer-mediated learning tools.

The chapter is guided by two main themes. First, web technologies are the dominant tools for navigating networked computers and they are adaptable to a broad range of integration strategies. The discussion focuses on the use of the Web as a delivery tool ("Web-centric"). Second, tax educators should assess the practicality of using the Web to satisfy the demands of the multiple stakeholders in the academic career for essentially the same information. The Web is a powerful tool for delivering information about career and course activities.

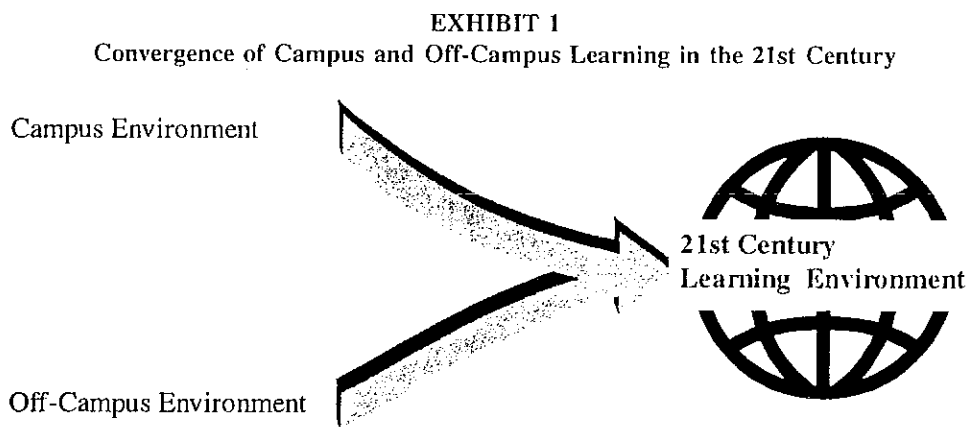
### THE TECHNOLOGICAL POTENTIAL

Convergence is probably the most pervasive of all the influential phenomena in the evolution of information and computer technologies. At the macro level, telephone, cable, satellite, and computers are converging and emerging as a single appliance, which is currently the desktop computer. At the micro level, different desktop operating systems (e.g., Macintosh, Windows, Linux) are converging to a familiar graphical user interface. In addition, different types of applications (e.g., word processors, spreadsheets, and presentation) are converging into information management applications that interact to share and deliver information prepared in different processes.

Exhibit 1 depicts how convergence will manifest itself in the learning process via a merger of the traditional learning and nonlearning environments. A student who is on campus, at work, at home, or commuting between them, will be able to access learning materials that:

- rely on multimedia resources (textual, audio, and visual),
- require interactive learning, and
- provide interpersonal communications channels between students, instructors, and practicing professionals.

In brief, the technology will facilitate a collaborative, interactive, and engaging learning process, on demand and just-in-time, rather than just-in-case (Boettcher and Conrad 1997, <http://>



www.microsoft.com/education/planning/online/distance\_faq.asp). The design of Web-centric materials will be theory-based, computer-imaginative, and learner-centered.<sup>1</sup>

### KNOW THE OBJECTIVES

Tax educators do not need, nor do the available and emerging technologies provide, a “one size fits all” strategy for integration. Educators have some latitude in selecting or developing strategies and tools that are appropriate for their respective educational environments. It is important to consider the institutional and individual objectives within that environment before committing to an integration strategy that will be resource-intensive.

#### Institutional

Since institutions (and their educators) are increasingly assessed on their ability to fulfill the institutional mission, educators should select an integration strategy that supports that mission. Otherwise it may be difficult to receive institutional support for the integration effort and promotion and tenure decisions.

Based on current thinking, an academic institution’s 21st century mission must reflect its choice on a continuum (Exhibit 2) bounded on one end by a belief that traditional campuses will cease to exist.<sup>2</sup> A student will enroll in the virtual university that meets his or her needs for a given course, using a wide area network (WAN) and the distance-learning mode discussed in this monograph’s Chapter 9 by Richard Newmark. Academic credit banks will maintain records of the student’s course work and provide the documentation required for degrees, professional certification, etc. At the continuum’s other end, traditional campuses will still exist, using local area networks (LANs) to supplement or supplant traditional pedagogy with computer technology on campus.<sup>3</sup>

It is useful to briefly consider how institutions’ choices on that continuum affect educators’ choices about Web-centric learning. The problems tend to be correlated with the distance between the networked computers, because the complexity of the network tends to increase with distance. There is a concomitant increase in the probability of miscommunications, technical incompatibilities, and transmission interruptions. To mitigate many potential problems, it is necessary to use alternative delivery mechanisms (e.g., video tapes rather than streaming video<sup>4</sup>) or computerized tools that consume fewer network resources (e.g., text rather than graphics). Exhibit 3 identifies

<sup>1</sup> Siegel and Kirkley (1999).

<sup>2</sup> Tapscott (1998, chap. 9).

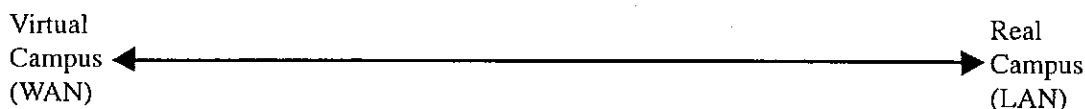
<sup>3</sup> Web-centric learning is commonly referred to as distributed learning, since it exploits the power of distributed (networked) computers. It is also referred to as distance learning in the WAN environment and proximity learning in the LAN environment.

<sup>4</sup> Streaming video (or audio) is a process in which the user’s computer begins playing the file contents in a steady and continuous stream before the file is completely downloaded on the user’s computer.

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#### EXHIBIT 2

##### Continuum of 21st Century Learning Facilities



**EXHIBIT 3**  
**Limitations Imposed on Educator's Strategy by Institution's Mission**

Characteristic/Component	Potential Problem	Appropriate Tool for Institution's Focus	
		On Campus (LAN)	On Earth (WAN)
Multimedia resources	Heavy consumption of storage and bandwidth <sup>a</sup> due to size of files	Streaming audio and video clips stored on campus network	Audio and video clips distributed via CD-ROM
Interactive learning	Heavy consumption of bandwidth, especially due to time online	Links to web-based materials and complicated simulations	Links between files downloaded from university's server
Interpersonal communications channels	Heavy consumption of bandwidth due to time online and simultaneous use of audio, video, and document sharing	Multiparty synchronous communications via conferencing software is used to share documents	Multiparty asynchronous communications via email and discussion pages

<sup>a</sup> Bandwidth is a measure of the network's transmission capacity.

some of the problems for each of the main characteristics/components of computer-mediated learning tools.

### Individual

Tax educators must also consider their career objectives when devising an integration strategy. Since the integration process can consume significant amounts of time, it may detract from other activities within the teaching-research-service triad. The amount of time devoted to an integration process can be optimized by a strategy that follows three steps. First, determine *which* applications and tools are feasible, given the available resources and incentives. These are institutionally specific factors that can be assessed by talking to colleagues, systems administrators, and students.

Second, identify *how* the technologies can be applied in tax education. Exhibit 4 presents one of many taxonomies that provide a framework for developing a strategy that is consistent with the institutional objective as depicted in Exhibit 2. While the taxonomy in Exhibit 4 provides guidance at a very general level, the taxonomy in Exhibit 5 emphasizes how networked computers are used to achieve the desired learning objectives on a day-to-day basis. Thus, the activities listed in Exhibit 5 are appropriate for any one of the strategies listed in Exhibit 4.

Finally, decide *when* to use the available applications and tools to enhance learning and career outcomes. There are many theories that suggest *when* certain applications and tools should be used in the learning process (Kearsley 1999, <http://www.gwu.edu/~tip/theories.html>; Muskingum College 1998, <http://muskingum.edu/~cal/database/introduction.html>; Thompson et al. 1992, 3-12). As recent articles about accounting education indicate, learning is a sequential process through which students must progress in a prescribed order (Bonner 1999; Gore and Wong-On-Wing 1998). Therefore, tax educators must properly sequence learning objectives and provide the appropriate learning tools and tasks to ensure that students have the abilities that enable them to proceed to the next stage of the learning sequence. For example, students should use a computer

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**EXHIBIT 4**  
**Taxonomy of Technological Applications in Learning<sup>a</sup>**

Classification	Description
Computer-aided teaching (CAT)	Computerized aids for teacher-mediated learning in the classroom or over a network
Computer-aided instruction (CAI)	Computerized aids for self-learning
Computer-managed instruction (CMI)	Computerized aids for managing and tracking student tasks and performance

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<sup>a</sup> Jensen and Sandlin (1992).

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to develop an appropriate tax plan for a taxpayer only after mastering the task's supporting skills and knowledge, including:

- use of the computer and the required applications;
- design of electronic workpapers with present-value calculations; and
- comprehension of tax-planning objectives and processes, decision making, and relevant tax law.

The important point is that the increasing abundance of computer-imaginative learning tools is worthless if educators use tools that depend on prerequisite skills and knowledge that students lack. The taxonomy of learning outcomes in Exhibit 6 provides a useful classification of learning objectives and suggestions for the appropriate application of computer technology.

Theory determines when to use the Web for learning and theory, but common sense and institutional policies and procedures determine when to use the Web to disseminate information to other audiences, such as current and prospective employers and alumni. Currently, young business professionals embrace the Web as a means of self-promotion, to develop what Tom Peters (1999) refers to as "The Brand Called You" (<http://www.brandyou.com/>). However, those professionals participate in a labor market that already values the Web's use for personal career

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**EXHIBIT 5**  
**Classification of Networked Computer Applications in Learning<sup>a</sup>**

Classification	Description
Data resources	Storage and retrieval of data maintained on the Internet or CD-ROMs
Tools	Preparation, distribution, and assessment of assignments
Simulations	Preparation of exercises from different sources, in which the student "programs" the computer and receives immediate feedback
Tutors	Completion and submission of exercises with monitoring, assessment, and feedback from educator
Communications	Communications between course participants via email, discussion lists, and conferencing applications

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<sup>a</sup> Bostock (1997, 227).

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**EXHIBIT 6**  
**Taxonomy of Possible Learning Outcomes<sup>a</sup>**

Learned Capability	Description	Examples of Appropriate Computer Application
Motor Skill	Ability to use skeletal muscle to accomplish purposeful action	Keyboard drills to improve data entry (alpha and numeric)
Attitude	Predilection toward certain behaviors, such as studying taxation	Any tools tailored for a student's learning style that engage him or her in active learning
Verbal Information	Facts and organized knowledge about the topic (declarative knowledge)	Computer-generated crossword puzzles to test understanding of definitions in IRC; computerized presentations about facts (in classroom or on web pages)
Intellectual skills	Ability to perform symbolically controlled procedures	<i>Pro forma</i> spreadsheets to analyze lease vs. buy decision; computer simulations to assess tax-planning strategies; computer-based tax research
Cognitive Strategy	Ability to monitor and manage cognitive processes	Repeated tasks about tax problems that provide timely feedback and demand self-analysis

<sup>a</sup> Gagné et al. (1992, 43–52).

management. Both those seeking positions and those seeking professionals appreciate the ease with which they can access and exchange relevant information via a web browser. For example, see the web pages published by the *Wall Street Journal* (1999, Executive Recruiters, <http://careers.wsj.com/>), Rebecca Smith (1999, <http://www.eresumes.com/>), CareerHunters.com (1999, <http://www.careerhunters.com/>), and Monster.com (1999, <http://www.occ.com/>).

Although there is little evidence that the academic community currently embraces the Web with the same comfort and enthusiasm as industry, there is evidence of progress. Institutionally, the American Accounting Association (1999) now posts placement and positions information on its web site (<http://www.rutgers.edu/Accounting/raw/aaa/placemnt.htm>). Individually, educators around the world are creating teaching portfolios of the type described by the Center for Teaching Excellence at Iowa State University (1997, <http://www.cte.iastate.edu/portfolio.html>), but it is difficult to find many web-based portfolios. This suggests that promotion and tenure committees are not currently willing to use web-based documentation, even though educators usually prepare and produce that documentation in a digital format. However, it is likely that in the future web-based professional portfolios will become the expectation rather than the exception. Tax educators who have more than a few years in their career-planning horizon can ease the future transition by planning and organizing now.

### KNOW THE AUDIENCES

Clearly, students are an important component of every academic institution's mission and the focus of this monograph. However, if educators use the Web to serve only their students, then

they are ignoring its power as a tool for presenting information about professional activities that can enhance career outcomes. Even worse, educators are wasting time by failing to leverage their information resources. As Exhibit 7 illustrates, educators have several audiences that demand substantially the same information about teaching and research activities. To the extent that information is created in a digital format, it is readily available to all of them once it is properly organized for web access.

The first goal is to insure that no one sees more information than they want. This goal can be achieved by dividing information into appropriate subsets, then using a web-based navigation scheme to “electronically compile” documents tailored to the information demands of each audience. For example, an educator could prepare one syllabus for each course taught. However, if similar learning tasks are used in each course, then it would be more efficient to divide the information for the syllabi into two main subsets—information that is common among the courses and information that is unique to each course. The former could go into a single web-based document accessible to all students, while the latter could go into separate web documents accessible only to students in each course. By partitioning the information this way, the students would see only what is relevant to their course, while the educator would be relieved of maintaining redundant information for multiple syllabi.

The second goal is to insure that no one sees more information than they need. There are many approaches to imposing access restrictions, including password protection and unpublicized (hidden) files.<sup>5</sup> The best approaches are based on the computer network’s design and security.

<sup>5</sup> For example, educators could disclose the location of course materials to students, but not disclose the location of the web-based promotion and tenure report that includes those course materials. The promotion and tenure committee, however, could be given access to the report with its links to the course material.

**EXHIBIT 7**  
**Educator Information Demanded by Various Audiences**

	Students, Current	Students, Potential	Parents	Colleagues	Employer, Current	Employer, Potential	Alumni	Publishers
<b>Teaching</b>								
Syllabus	x	x	x	x	x	x	x	x
Materials	x	x	x	x	x	x	x	x
References	x	x	x	x	x	x	x	x
Grade reports	x							
Student evaluations		x	x		x	x	x	
<b>Research and Publications</b>								
Journal articles					x	x	x	x
Working papers					x	x	x	x
Conference presentations					x	x	x	x

Typically, network security and privacy concerns are beyond educators' control, so they must be discussed with the network administrator. As a general rule, sensitive information should not be put on the Web unless network security insures that the information will not be compromised.

### KNOW THE RESOURCES

Hardware, software, time, and skill are the key resources in web-based information management. They are also the primary sources of the speed bumps and roadblocks that litter the Information Superhighway and complicate communications over the Web. There are three important participant groups in the complex communications channel that links tax educators and their audiences (Exhibit 8), and the resources of each group determines what can be communicated:

- Educator resources determine what can be developed.
- Network resources determine what can be delivered.
- Audience resources determine what can be received.

The guiding heuristic is that educators should not adopt an integration strategy that exceeds the resource capacity of any of the *significant* participants in this communications channel.<sup>6</sup>

#### Educator Resources

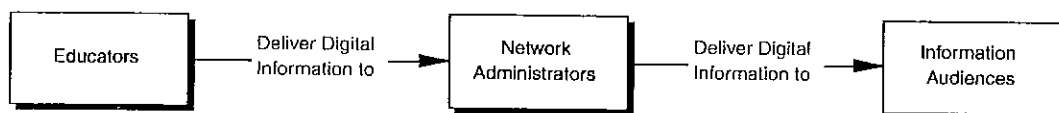
While the ability to create more sophisticated web-based documents (i.e., multimedia) increases as computing capacity increases,<sup>7</sup> web-based documents can be prepared with any computer. It is not necessary to have the latest and greatest specialized web-development resources, since modern desktop applications are converging into web-development applications. The skills and documents developed with word processor, spreadsheet, database, and presentation software are quickly and easily adapted to a web-based integration strategy. Alternatively, the same skills and documents can be applied to more specialized software for the development of more sophisticated web pages that include features such as frames, dynamic and interactive content, animation, streaming media, and more attractive and consistent design/navigation features (Tashian 1999, <http://www.nashville.net/~carl/htmlguide/index.html>). Either way, educators do not need to completely retool in order to implement an effective and efficient web-based strategy.

It is necessary to devote a significant amount of time to planning and implementing that strategy and maintaining web-based materials. Educators have the luxury of a captive audience (students). They do not need to continuously revise web sites to attract viewers, but they cannot simply post material to the Web then coast through the term (i.e., a "post-and-coast" strategy).

<sup>6</sup> The significant participants are those who educators must consider in order to fulfill the related mission and objectives. The insignificant participants are those who have nothing more than a casual interest in the web-based information. It is probably not efficient or effective to adopt an integration strategy that satisfies the resource constraints of both participant types.

<sup>7</sup> In this context, increased capacity means having ore storage on a hard drive, more processing memory (RAM), more video memory, and faster processing speeds. Multimedia development also requires a soundcard and a CD-ROM, and a larger monitor is easier to work with.

**EXHIBIT 8**  
Web-Based Communications Channel





By definition, web pages are always under construction, especially if they include links to outside resources such as the AAA, AICPA, and IRS web sites. The functionality of those links must be checked periodically, because even captive audiences do not tolerate dead ends. It is impossible to precisely estimate the amount of maintenance time required, since it depends on the features used in the web site and on personal preferences and practices. It is likely to take at least two hours a week per course, and it will always take more time than anticipated.

### Network Resources

The Web is a worldwide computer network. Therefore, an integration strategy should consider the worldwide resources, especially their susceptibility to congestion that impedes information delivery. In addition to normal daily traffic patterns, unusual events such as heavy snowstorms in major metropolitan areas and the release of sensationalized political documents generate increased traffic and congestion. While the worldwide resources are important, they are also beyond educators' influence. Thus, emphasis must be placed on the network hardware and software (i.e., the server) that is used to deliver information from academic institutions to the Web. In other words, think globally, but act locally.

The server must have the power and the ability to provide a substantially uninterrupted web presence. Its power and limitations should be assessed before developing materials with resource-hungry animations, interactions, and streaming media. Ideally, the server is under the control of a network administrator who is well versed in network security and supportive of educational efforts. Assuredly, the server is not under the control of an administrator who has a great deal of time to support individual efforts. Educators must appreciate that network administrators have too many tasks and too little time. Chapter 7 of this monograph by Amy Dunbar discusses course-management software that helps network administrators and tax educators better manage the time and effort required by Web-centric integration strategies.

Educators can outsource to an off-campus web presence provider (WPP)<sup>8</sup> or serve as their own network administrators using their desktop computers. The former approach is an increasingly viable alternative, as more WPPs offering "free" web-hosting services<sup>9</sup> enter the market. There are several WPPs dedicated to education, including many textbook publishers. Asymetrix Learning Systems (1999, <http://click2learn.asymetrix.com/>), eInstruction (2001, <http://www.einstruction.com/>) and Jenzabar.com (1999, <http://Jenzabar.com>). Others can be located by reading the advertisements in popular computer magazines or by searching on the Web (e.g., CNET, Yahoo!, or Infoseek). Educators should carefully investigate each candidate provider with respect to price, level of support, type of connectivity, and years (months) of experience. The latter approach of serving as one's own network administrator is feasible, but requires additional web site management software plus devotion to security issues. Those issues are complex ones that few educators are trained to resolve. In general, web server administration is best left to experts.

### Audience Resources

As noted, the student audience is a captive audience. This does not mean that it is an appreciative audience. It also does not mean that it is an attentive audience, although attentiveness is extremely important when the Web is used as a learning tool rather than just as an expeditious delivery mechanism. Arguably, attentiveness is even more important with the other targeted audiences, because they are not necessarily captive audiences. Capturing and retaining audience

<sup>8</sup> An Internet service provider (ISP) provides access to the Internet and might provide space for web pages, while a web presence provider specializes in providing space for web pages.

<sup>9</sup> Following the business model for most "free" web services, educators' web pages on a free host would usually contain commercial advertising placed there by that host.

appreciation and attentiveness does not require leading-edge multimedia, but it does require that tax educators be sensitive to time. The members of every audience must believe that the web-based strategy is more effective and efficient vis-à-vis the alternatives or they will become unappreciative, inattentive, and frustrated.

The time it takes to access web-based materials depends on the audience's computing power and the design features that educators incorporate into web pages. Computing power for a Web-centric strategy is determined by users' skills, computing hardware and software, type of Internet connection, and type of web browser. Educators must consider each of those components when deciding how and what to deploy on the Web. For example:

- *Pro forma* spreadsheet simulations are feasible only if students have spreadsheet software that is compatible with educators' spreadsheet software; and
- Web-based videos of conference presentations are advisable only if academic committee members have fast (broadband) Internet connections and web browsers that are compatible with educators' web-development application.<sup>10</sup>

In addition, it is futile to deploy web-based information if audiences cannot find it. As discussed in the next section, web sites must be well designed and web pages must provide navigation tools that have intuitively clear purposes. This requires redundancy because the members of the different audiences bring such diverse sets of computing skills to the Web.

It is not easy to determine the computing power of all potential audiences (especially those who access the web pages from off campus), nor is it possible to anticipate and avoid all the frustrations that they will encounter. However, by surveying students, faculty, and administrators before developing web pages for them to view, analyzing the access logs maintained by systems administrators, and giving all viewers the opportunity to provide immediate feedback from each web page, it is possible to develop a better understanding about the audiences' range of computing power. Probably the most important computer resource that tax educators can nurture with their audiences, and especially with their students, is a computing environment that is conducive to exploration and experimentation: an environment of patience, cooperation, and mutual professional respect.

### **DEVELOP, DELIVER, AND MAINTAIN INFORMATION**

After the audiences are identified, their information needs assessed, and their resource capacities determined, it is time to establish a web presence. A viable, sustained presence entails developing, delivering, and maintaining web pages that provide the necessary information in a timely and expedient manner.

#### **Develop the Information**

The process starts with planning content and design. The focus in this stage is on compiling the information that meets the objectives and designing web pages that facilitate delivery.

#### *Web Page Content*

Most of the web-based content used by tax educators will probably be alphanumeric text. It is also likely that it will be produced from scratch or adapted from textbook materials, although there is an increasing amount of web-based material available as links. The production process requires some combination of the desktop applications that educators use every day (i.e., spreadsheet, word processor, and presentation software) and dedicated hypertext markup language (HTML) editors.

<sup>10</sup> The Netscape and Microsoft browsers that dominate this market do not process and display all web documents the same way.

The documents prepared and processed with the desktop applications can be distributed on the Web in one of three ways. They can be placed on the Web server in their native format (e.g., as an Excel spreadsheet). Students access and download the documents to their desktop computers via a link on a course web page. This method is appropriate when the members of the audience need to work on the documents, but it is not appropriate unless they have software that is compatible with that used by the educator to prepare the documents.

Alternatively, documents can be saved as either portable (PDF) or HTML documents. Both formats provide universal access in that audiences do not need the software used to prepare the document, but they cannot edit those documents. These formats are appropriate if the audiences are heterogeneous with respect to software and operating systems and only need to view the documents. Many of the popular desktop applications allow documents to be saved in the HTML or PDF format from within the application, so the conversion requires no more effort than saving a document in its native format. However, as explained in Chapter 6 by Debra Callihan, educators who wish to save in the PDF format must first install Adobe Acrobat software.

If an HTML editor is to be used either exclusively or in conjunction with the desktop applications, educators should consult colleagues, systems administrators, and Internet sources such as TUCOWS (<http://www.tucows.com/>) or Stroud's (<http://cws.Internet.com/>) for advice. There are many editors available to satisfy any combination of personal needs, skills, preferences, and budgets. The modern editors claim to be WYSIWYG (what you see is what you get). That means, in part, that they operate like a word-processing application and it is not necessary to know how to write HTML code. There is almost no learning curve and the output is more than satisfactory. Web content can be created directly in these editors or cut and pasted from other desktop applications.

Educators can enhance web page content (and perhaps learning outcomes) by adding multimedia elements and links to other web-based resources. The Stroud's and TUCOWS web sites list and evaluate multimedia software used to process different types of media (Exhibit 9). Multimedia creates problems for viewers who do not have high-speed (broadband) Internet access. It must therefore be used judiciously. Links to publicly available web-based resources obviate the need to process media. Some of the sources listed in Exhibit 10 provide professionally developed multimedia about topics that have at least tangential relevance to tax education. Better yet, Chapter 5 by Jerrold Stern identifies several sources of Web-based information directly related to tax education and the AAA's Accounting Coursepage Exchange (AAA 1999, <http://www.rutgers.edu/Accounting/raw/aaa/ace/search.htm>) provides more tax-specific examples and materials.

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**EXHIBIT 9**  
**Multimedia Enhancements and Development Tools**

Type of Material	Examples of Suggested Software <sup>a</sup>
Audio	MS Sound Recorder (with Windows) or soundcard software
Video	RealPlayer, NET TOOB, MS Media Player
Graphics, still	MS Image Composer or Photo Editor, Map This!, Graphic Workshop
Graphics, animated	MS GIF Animator, Ulead GIF Animator, GIF Construction Set
Screen captures, still	HyperSnap, SnagIt
Screen captures, video	HyperCam, Lotus Cam, MS Cam

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<sup>a</sup> Some of this software comes packaged with other applications (MS Sound Recorder is in MS Windows), some is freeware (RealPlayer), and some is commercially available from the Web (Hypersnap).

**EXHIBIT 10**  
Sources of Supplemental Content for Course Web Sites

Source	Content
CNN Interactive <a href="http://www.cnn.com/">http://www.cnn.com/</a>	News clips in audio and video formats
Datachimp <a href="http://www.datachimp.com/articles/financial/diagram.htm">http://www.datachimp.com/articles/financial/diagram.htm</a>	Investment information and accounting material
<i>Elements of Style</i> (Strunk) <a href="http://www.bartleby.com/141">http://www.bartleby.com/141</a>	The preeminent guide on writing style
Money <a href="http://www.com/money/">http://www.com/money/</a>	Financial tool kit for analysis and decision making
RealNetworks Business <a href="http://www.real.com/realguide/business/index.html">http://www.real.com/realguide/business/index.html</a>	Business news in text and streaming audio/video
Study Web <a href="http://www.studyweb.com/business/toc.htm">http://www.studyweb.com/business/toc.htm</a>	Study guide for business and finance

### **Web Design**

To facilitate access to their information, educators must be attentive to the design of the web site and each web page (Fortress Web Design 1999, <http://www.fortressdesign.com/advice.html>). There is a choice between "quick or cute." Quick seems more prudent, especially for the student audience that is required to take a tax course or is not on the campus network.

"Quick" is implemented by expediting navigation of the web site. First, quick navigation requires a consistent design on every web page so that the audience does not have to repeatedly adapt. Individual pages should use the same basic layout, background colors, and typography. Differences between pages should be used to provide visual cues that there is a difference in content or topic. For example, different layouts can be used for different courses taught and for the different research topics pursued; different colors and fonts can be used to add obvious emphasis. Expeditious navigation also requires obvious and redundant navigation tools on every page, including toolbars, buttons, and text links. This approach is especially important for long web documents and the less frequent visitors.

Second, and most important, expedited navigation means restricting the size of each page. Size is measured by the number of kilobytes, because this metric measures all types of content and indicates how quickly a viewer's browser will download a web page. Some web-development tools such as Microsoft FrontPage 2000 (<http://www.microsoft.com/catalog/display.asp?site=768&subid=22&pg=1>) indicate the download time of each page, but actual download times from different access points should be verified during tests of the web site and pages.

Testing is a critical part of the web-development process. In the planning stage, a storyboard is useful for assessing the logic and flow of the site and the content of each page. Testing at this stage is especially important for educators who are responding to the information demands of different audiences and need to tailor the content without duplicating effort. At some point, a prototype of the web site must be tested. Educators new to web-page development will find it useful to test a skeleton of the site, with links but no content.

### **Deliver the Information**

The ultimate responsibility for delivering information over the Web lies with the web server administrator (Exhibit 8). An educator not serving as his or her own administrator must first

transfer the web pages from his or her computer to the server. The method used depends upon the network and the software. It might be as easy as copying files from one directory (folder) to another over the university's Intranet or it might require use of the Internet to FTP (file transfer protocol) files to the server. Although it is not a complicated task, the server's administrator must be consulted to identify the appropriate procedures and software.

Web pages and sites are not immune to Murphy's Law. Therefore, it is imperative that the site be tested after the web pages are posted to the Web server and before they are publicized. It is a good idea to have others test it, too. Just because it works fine from one computer for the developer and designer, does not mean that it will work as intended from a different computer used by a stranger. ZDNet (<http://www.zdnet.com/devhead/resources/tools/>) offers free web-based testing services that check various web site characteristics such as browser compatibility, HTML standards compliance, and access time.

### Maintain the Information

As noted, "Web page under construction," is redundant. Web pages, especially those with links to information sources that are beyond local control (e.g., IRS and ATA Websites), require programmed maintenance to insure that the links remain active. Updates are also necessary due to the dynamic nature of the tax environment, the need to occasionally amend the course syllabus, and evolving skills with web-based education. Whatever the reason, it is unrealistic to believe that materials can be posted to the Web and then forgotten. It is advisable to include a "mail-to" link and other contact information at strategic locations throughout the web site, to provide audiences with a convenient means of communicating problems, suggestions, and comments.

### CONCLUSION

Information technologies are revolutionizing the academic enterprise and creating a global market for education that is oblivious to the space-time constraints of today's campus. Tax educators who want to survive the revolution must successfully integrate the technologies into their careers. Thus, educators must plan, develop, deliver, and manage Web-centric learning materials that are theory-based, computer-imaginative, and learner-centered, and not forget that the Web is a tool for delivering information about courses and careers.

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## USEFUL WEB REFERENCES

### General Web Page Design Resources

- Authoring and Site Design. Available at: <http://builder.cnet.com/webbuilding/0-3881.html?tag=b1>
- C|Net Site for Site Builders—<http://www.builder.com/?st.cn.fd.tbtop.Web>
- Yale C/AIM Web Style Guide—<http://info.med.yale.edu/caim/manual/>
- Web and Software Resources—<http://www.willyancey.com/Web.htm>
- Web Developer's Virtual Library—<http://www.stars.com/>
- Web Pages That Suck—<http://www.Webpagesthatsuck.com/>
- ZDNet Help Site—<http://www.zdnet.com/zdhelp/>

### Web Presence Providers

- Asymetrix Learning Systems—<http://click2learn.asymetrix.com/>
- Server 101—<http://www.server101.com/>
- Tripod—<http://www.tripod.com/build/>
- Xoom.com—<http://xoom.com/Webspace/>

### Educational Applications of Technology and Web Pages

- Center for Internet Technology in Teaching—<http://www.marin.cc.ca.us/~jim/wkshop/citt.html>
- Developing a Course Web Page—<http://www.knc.lib.umich.edu/guides/CourseWeb/gsihome.html>
- Journal of Interactive Media in Education—<http://www.jime.open.ac.uk/index.html>
- Putting Your Course Online—<http://www.library.okstate.edu/dept/dls/prestamo/nom/>
- Ron Tidd's Web Page—<http://www.rttidd.com/>
- Sloan Center for Asynchronous Learning Environments—<http://franklin.scale.uiuc.edu/scale/>
- Technological Horizons in Education (T.H.E.) Journal—<http://www.thejournal.com/>
- The Technology Source—<http://horizon.unc.edu/ts/>

The Wired Professor, Book Companion Web Site—<http://www.nyupress.nyu.edu/professor.html/>  
Yahoo! Education Links Page—<http://dir.yahoo.com/Education/>

**Tax and Accounting Resources**

AccountingNet—<http://www.accountingnet.com/>  
AICPA CPA Vision Project—<http://www.cpavision.org/>  
AICPA State Tax Guide—<http://www.aicpa.org/states/info/index.htm>  
ATA Home Page—<http://www.uni.edu/ata/>  
Internal Revenue Service—<http://www.irs.ustreas.gov/>  
Ryan & Company, State and Local Taxes, Electronic Commerce—<http://www.ryanco.com/gateway/electron.html>  
Robert Jensen's Web Documents and Other Links—<http://www.trinity.edu/rjensen/>  
Tax World—<http://www.taxworld.org/>  
TaxWeb—<http://www.taxWeb.com/>  
Wills on the Web—<http://www.ca-probate.com/wills.htm>