Managing the Cost of Information Technology Resources in Accounting Education

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Abstract

The cost of information technology resources to support the teaching of accounting at universities can be prohibitive and a significant issue for technology managers in education. In many cases, these resources must not only be purchased by the university, but also by each of the students. This can present a significant obstacle to both the university and the accounting students. Many university technology managers and accounting faculty may not be aware of the wide variety of quality information technology resources that are available for free. This paper provides an overview of free software and multimedia information technology resources that can be used to support a hands-on, interactive accounting education. Provided a personal computer with a Web browser and internet connection, students can have access a huge variety of exciting, interactive, and relevant learning material that is directly related to what they are learning from the textbook and instructor lectures. Given the tight budgets of many colleges and universities, the no-cost aspect of these technologies can be a significant benefit.

1. Introduction

The cost of information technology resources to support the teaching of accounting at universities can be prohibitive and a significant issue for technology managers in education. In many cases, these resources must not only be purchased by the university, but also by each of the students. This can present a significant obstacle to both the university and the accounting students. The information technology managers, in concert with the accounting faculty, can make a conscious decision to reduce these costs by employing free software (such as StarOffice) in the place of commercial software (such as Microsoft Office). This can free up money for other important budgetary needs.

Many university technology managers and accounting faculty may not be aware of the wide variety of quality information technology resources that are available for free. To help address this issue, this paper provides an overview of free software and multimedia information technology (IT) resources that can be used to support hands-on interactive accounting education. Provided a personal computer (PC) with a Web browser and internet connection, students can have access a huge variety of exciting, interactive, and relevant learning material that is directly related to what they are learning from the textbook and instructor lectures. While the amount of information on the Web is staggering, and in many forms, this paper focuses on interactive multimedia technologies (such as software, audio, video, animation, etc.) that can be accessed and used for free (subject to any software license terms). Given the tight budgets of many colleges and universities, the no-cost aspect of these technologies can be a significant benefit.

The information in this paper is specifically tailored for an introductory accounting course, although much of the technology suggestions (such as spreadsheets) could probably be applied to many other business courses.

An introductory accounting course is usually a required business core course that provides a broad overview of accounting topics as listed below. The general accounting course is typically a required core course that provides a broad overview of the subject area. For example, the percentage occurrence (n=12) of introductory accounting learning objectives that occur in syllabi (Lee and Bisman, 2006) are:

- Prepare financial statements (92%)
- Interpret financial statements (75%)
- Understand the role of accounting (67%)
- Record transactions (50%)
- Identify accounting information users (42%)
- Understand principles of financial reporting (33%)
- Make ethical judgments in business (33%)
- Apply double-entry accounting (25%)
- Use accounting equation (25%)
- Identify internal control issues (25%)
- Identify various business structures (25%)
- Understand and design a simple accounting information system (25%)
- Communicate accounting information (25%)
- Develop spreadsheet skills (25%)

Because the core accounting course is typically required of all business students, a wide variety of accounting knowledge and skill levels will typically be encountered in the classes. Hands-on, active learning techniques can be more motivating for students, help students learn, and increase their confidence with course material (Harton et.al, 2002).

There is a wide variety of hands-on information system and technology resources available online to support active learning in accounting. These resources include software, demonstrations and animations, self assessments, video, audio, 3-D environments, and games. Most importantly, these resources can be used free of charge, an important consideration for many educational institutions and technology managers.

2. Information System Requirements

Certain hardware, software, and administrative resources are required to leverage these IT resources.

First, students will need access to a Windows-based PC with a late model Internet Explorer Web browser (e.g., Internet Explorer 6.0+) and access to the Internet. Other Web browsers and operating systems may work, but this paper specifically addresses Internet Explorer on the Windows operating system. Second, many of the software applications or Web browser plug-ins (such as Macromedia Flash) may require the installation of applications on the PC. This will probably necessitate close coordination with the system administrator to install any applications on any university computers.

The following interactive accounting related information technology resources are discussed in the next section: software, video recordings, audio recordings, virtual worlds, games, and instant messaging.

3. Information Technology Resources

In this section, we discuss the following free software resources to support interactive accounting: small business financial accounting, enterprise accounting on the web, payroll accounting, payroll and time management accounting, tax accounting, professional time billing, asset management, and invoice creation. These software resources can be used by accounting faculty to provide students with practical exercises that employ real-world accounting software.

Free small business **financial accounting software** includes GnuCash and Microsoft (MS) Office Accounting Express (http://www.microsoft.com). GnuCash software supports personal and small-business financial-accounting. It is provided under the GNU free license and allows students to track bank accounts, stocks, income and expenses (http://www.gnucash.org). Figure 1 provides a screenshot of the GnuCash software. Microsoft Office Accounting express is the free version of MS Office Accounting Professional software. It is designed for home office–based small businesses and supports online sales, invoicing, and payment processes.

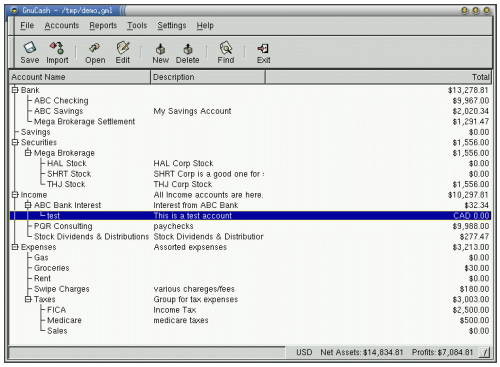

Fig 1. GnuCash Screenshot

The NolaPro suite (see Figure 2) provides free **web-based enterprise accounting** services to include order management, accounts receivable, inventory tracking, accounts payable, payroll services, and general ledger (http://www.nolapro.com). Accounting students could use this applications to become familiar with these types of accounting concepts.

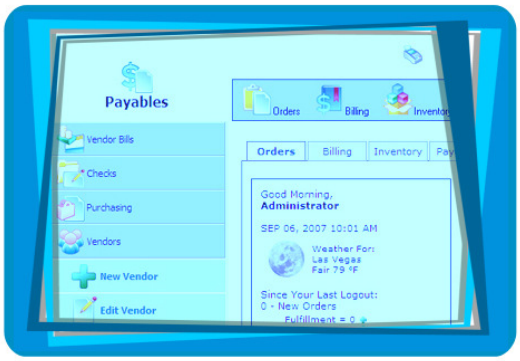

Fig 2. NolaPro Accounting Services Screenshot

Free **payroll accounting and time management** software is provided by Timetrex software (see Figure 3) that allows companies to schedule, track time and attendance, and provide payroll services for employees (http://www.timetrex.com). Professional **time billing** is provided by BS1 software, which allows project managers to assign and bill project time against tasks. It also provides stopwatch, hourly rate, multiple currency, and time calculator functions (http://www.dbsonline.com).

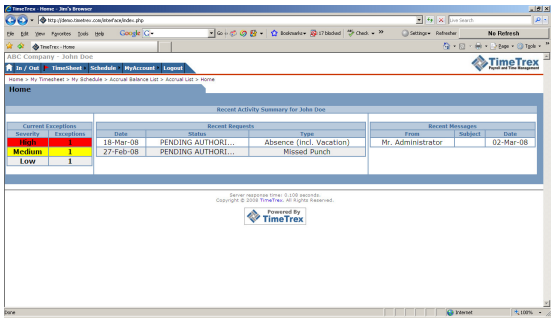

Fig 3. TimeTrex Software Screenshot

United States federal **tax accounting** is available for free by TaxAct software. Because it is online, students can practice filing tax returns from any computer with an internet connection and a browser. The online service provides interview questions, IRS forms and schedules, and a tax summary (http://www.taxact.com).

Students can practice **asset management** using the no-cost asset management database from GI

Business Data Solutions at http://www.galleryimage.com.au/Assets_Database.htm. It provides the ability to track, schedule, and report assets to include their acquisition, description, history, location, maintenance, and depreciation details. See Figure 4 for a screenshot of this software.

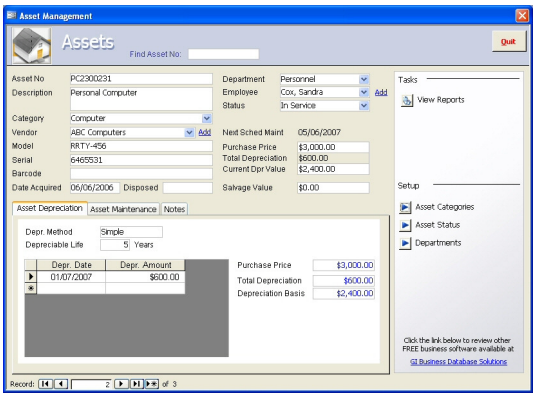

Fig 4. Screenshot of Asset Management Software

Accounting students can create, edit, and print custom **invoices** using the free Commercial Invoice software from Collection Agency Services at http://www.collectionagencyservices.net/software/Commercial-Invoice.html

Videos can add some excitement to a class and can be used to engage the students in ways that are different from the traditional lecture format. Online videos related to accounting include those addressing managerial accounting (http://www.youtube.com/watch?v=pBCRmjnwWgo), financial Analysis (http://www.youtube.com/watch?v=Vh-G3OGLBO4), and financial reporting (http://www.youtube.com/profile?user=SusanCrosson).

Audio streams can be listened to online, or in many cases, can be downloaded to a mobile device and recorded for later listening (e.g., **podcasts**). Some engaging podcasts include Accounting Best Practices with Steve Bragg (http://www.podcastdirectory.com/podcasts/32099) and Best Accounting Practices (http://www.podcastdirectory.com/podcasts/2725).

Accounting students can listen to archived current events and news stories via streaming audio at a number of online radio sites. Of particular note is www.npr.org, which provides archived segments from Morning Edition, All Things Considered, Day to Day, Talk of the Nation, Fresh Air, The Tavis Smiley Show, Weekend Edition Saturday, Weekend Edition Sunday, or the Motley Fool Radio Show. A streaming audio player will be required (such as the no-cost Windows Media Player from http://www.microsoft.com or the free Realplayer from http:///www.real.com). To find accounting specific current events, students can go to http://www.npr.org/search.php?text=accounting.

Accounting students can practice their skills in three dimensional virtual **online worlds** at the second life virtual world site (http://slurl.com/secondlife/Teaching%204/59/162/22). The accounting learning tasks were created by Steven Hornik of the University of Central Florida. His approach to teaching accounting in this virtual world is explained in a video on his Web page (http://www.mydebitcredit.com/about). A screenshot from his virtual world is shown in Figure 5.

Fig 5. Screenshot of Accounting in an Online Virtual World

Accounting **games** can provide engaging interactive learning experiences for accounting students. The 'Catch Me if You Can' game at http://www.catchmegame.com puts the student in the role of a forensic accountant who must catch a con man. Players of the Turnaround game (http://www.theturnaroundgame.com) must use their business and accounting skills to develop a business plan that will save a struggling music company.

Students can assess their knowledge of accounting at http://tutor2u.net/quiz/accounting/default.asp. This Web site provides self test multiple choice quizzes on analysing financial performance, balance sheets, budgets and business plans, cash flow, equity finance, investment appraisals, managing working capital, profit and loss accounting, revenues, costs and break-even, and sources of finance. The BizEd Web site (http://www.bized.co.uk/learn/accounting/infosystems/bait/principles.htm) provides **worksheets and self-assessments** of the users of accounting information, the 'accounting equation', double-entry for assets and liabilities, revenues and expenses, balancing accounts and the trial balance, accruals and prepayments, accounting concepts and conventions, control accounts, suspense accounts, partnership accounts, and the accounts of clubs and societies.

Accounting students are likely to require **personal productivity software** to conduct typical knowledge based tasks. The StarOffice suite provides free spreadsheet (Calc), presentation (Impress), word processing (Writer), drawing (Draw), and database (Base) applications that are predominantly compatible with MS Office products. These applications can be downloaded for accounting education purposes from http://www.openoffice.org. A screenshot of StarOffice Calc is shown in Figure 6.

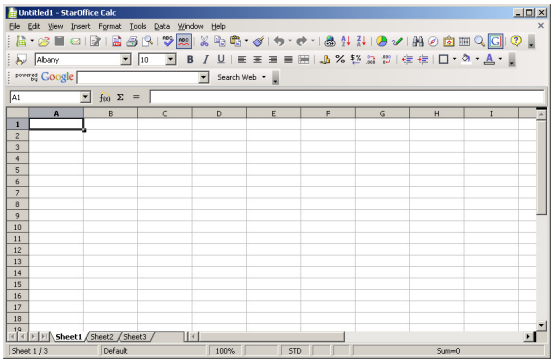

Fig 6. StarOffice Calc Screenshot

A key question is the degree of compatibility with MS Office products. A list of MS Office features that may cause compatibility problems with StarOffice products includes: MS Word (autoshapes, revision marks, embedded and linked objects, certain controls and MS office form fields, indexes, some tables, frames, and multi-column formatting, hyperlinks and bookmarks, MS wordart graphics, and animated text); MS Excel (autoshapes, embedded and linked objects, certain controls and MS office form fields, pivot tables, new chart types, conditional formatting, some functions and formulas); and MS PowerPoint (autoshapes, tab, line, and paragraph spacing, master background graphics, grouped objects, and certain multimedia effects).

If these features are not used or required, then the StarOffice suite can provide an inexpensive alternative to MS Office. In addition to reading, and saving, documents that are in an MS Office format, StarOffice can also work with Rich Text Format (RTF) and WordPerfect (WPS) formats. Free online word processing, spreadsheet, and presentation software is also available from Google at http://docs.google.com. A powerful open source database is available from http://www.mysql.com.

Additionally, Microsoft (http://www.microsoft.com) provides free **converters and viewers** for their PowerPoint presentation, Excel spreadsheet, Outlook email, Project management, and Visio drawing applications. These converters and viewers help accounting faculty and students share files with people who may not have MS Office programs or who may have different versions of Office applications.

Collaboration systems allow accounting students and faculty to share files, conduct Web meetings, and share calendars. These capabilities are particularly important for online or hybrid (a combination of online and in-class) courses. Free collaboration tools include Yugma (http://www.yugma.com) and Dimdim (http://www.dimdim.com). Figure 7 shows a user sharing and annotating a presentation slide with other Yugma collaboration session participants.

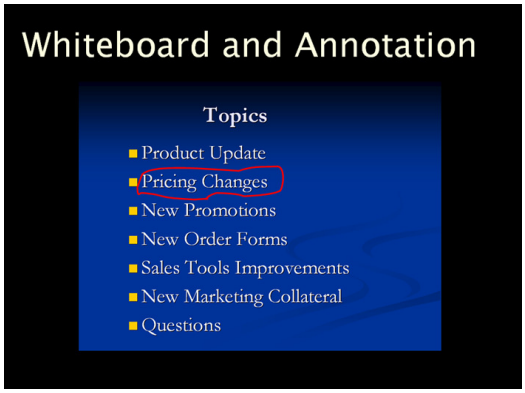

Fig 7. Yugma Collaboration Software Screenshot

Instant messenging (IM) software can be downloaded from http://www.aol.com. This software allows students to instantly communicate amongst themselves and the instructor via real time text messages.

A free **text chat** application is available from http://chat.yahoo.com. The instructor can create either a public or a private chat room. A private chat room will be restricted to invited members (such as only students). The text chat applications often require that the browser be capable of running Java applets. It should be noted that some firewalls may not allow Java applets to pass for security reasons. This may cause issues for some students using the software. **Audio chat** can be conducted on a chat server by logging on at http://chat.yahoo.com and clicking on voice chat. The system will require both a microphone and a speaker (or headset) to use the function.

Project management software can be used by accounting students to practice planning and budgeting a project. Free project management software is available from Open Workbench (http://www.openworkbench.org) as shown in Figure 8. This software provide students with the ability to define, create, schedule, track, and manage interdependent project activities, phases, tasks, and milestones while managing the resources necessary to accomplish the tasks.

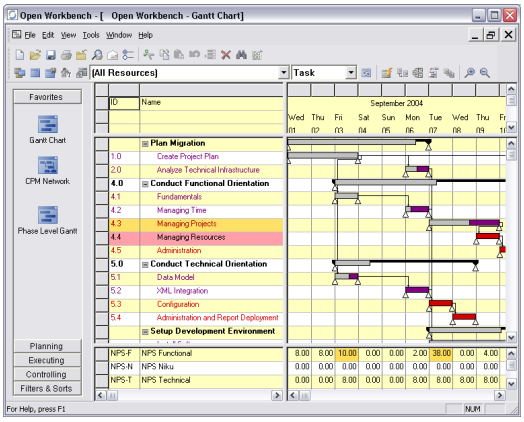

Fig 8. Open Workbench Screenshot

4. Summary and Conclusion

University technology managers can use the free, interactive IT resources discussed in this paper to reduce the IT costs of supporting the accounting curriculum. Faculty can use these resources to support engaging, hands-on active learning in their accounting courses. Provided a PC with a Web browser and internet connection, faculty and students can have access a huge variety of exciting, interactive, interesting, and relevant learning material that is directly related to what they are learning from the textbook and instructor lectures. Additionally, many of these wonderful free resources may also be applicable to other college courses as well.

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