Basic Digital Video Editing with VideoStudio

Melanie O. Anderson
Assistant Professor of Business and Director of Continuing Education
University of Pittsburgh at Titusville
504 East Main Street
Titusville, PA 16354
814-827-4415
moanders@pitt.edu

Introduction

Video clips to support classroom instruction are becoming more common. They can be integrated into internet tools such as BlackBoard, or into PowerPoint presentations. For example, chemistry experiments can be demonstrated, physical therapy methods can be replayed and practiced in preparation for practicum, etc.

Video editing software allows you to transfer footage from your camcorder. Then the scenes can be arranged, special effects applied, images overlaid, animated titles added, voiceover narrations added, and background music added. (These are separated into tracks for each layer.)

Software Alternatives

Ulead's Video Studio is one of many products that are available for video editing. These products differ in some features as noted in the table below. This is just a small listing of the software available.

Product	Ulead Video Studio	Dazzle DVD Complete	Video Explosion Deluxe	Adobe Premiere	Pinnacle Systems Studio DV	Windows Movie Maker 2
Platform	PC	PC	PC	PC	PC	PC
Version	7.0	n/a	n/a	6.0	7	2
OS	98 ME 2000 XP	98 ME 2000 XP	98 ME 2000 XP	98 ME 2000 NT 4	98	XP
Min Drive Space	500 MB	250 MB	Not specified	Not specified	150 MB	2 GB
Min Processor	Pentium III 450 MHz	Pentium	Pentium II	Pentium 300 MHz	Pentium 233 MHz	Pentium 600 MHz
Min RAM	64 MB	128 MB	128 MB	32 MB	64 MB	256 MB
Price	$89	$59 to $89		$136 - $152	$99	free

VideoStudio

VideoStudio uses an easy step-by-step methodology to easily and quickly create a movie. All the tracks in your movie are organized into a video project file (*.vsp), which contains all the video and audio information necessary to render your movie.

System and hardware requirements

VideoStudio is one of many software packages that makes movie making simple. The current version is 7.0, and retails for $89.95 (web download). VideoStudio was developed by Ulead, a company based in Taiwan (www.ulead.com). VideoStudio has the following system requirements:

- MS Windows 98, Me, 2000, or XP
- 800 MHz CPU speed
- 256 MB RAM
- 500 MB of hard disk space; 4 GB recommended
- Video for Windows or Direct Show compatible video capture card
- Windows compatible sound card
- CD-ROM or DVD-ROM drive

In addition, a video capture interface must exist to capture digital or analog input.

Digital

A digital video camera or digital camera that will record video is assumed. To transfer the data to your computer, an IEEE 1394 capture card (firewire) card is necessary. This is usually connected to the camera with a cable, but may be wireless if Windows XP is used.

Analog

If taking video from an analog device, it must be connected to the capture card with audio/video jacks or S-video. VideoStudio recommends that the analog capture card support RGB or YUV capture.

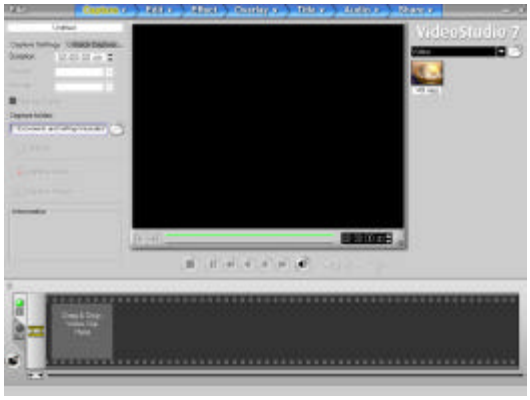
Other software and drivers must be installed to use VideoStudio, including QuickTime 6.0, RealPlayer 8.0, Indeo 5.1 (compression and decompression software), and Adobe Acrobat Reader 5.0. (The help manual is a PDF file.)

VideoStudio has improved dramatically from earlier versions (4.0 and lower). The software has many special effects and supports many of the popular file types. Ulead gets low marks by most reviewers for its telephone support, if you need to go beyond the help manual.
VideoStudio recommends that the DV tape be formatted prior to shooting video. This can be accomplished by recording the entire tape with the lens cap on. This will facilitate batch capture and accurate location of time codes.

Capturing Video

Video can be captured from a connected input device (digital or analog). VideoStudio automatically detects the capture settings. This step is very resource intensive and requires large amounts of disk space. Other programs should be shut down, and best results are achieved with a dedicated video hard disk.

Click on the capture menu item. When you start capturing/recording, there is a slight delay as the connections are made and recording begins – so you may want to position the tape a little prior to the actual spot where you want to record. It is easy to trim later on if you have captured too much. Leave the video camera power on until the clip has been captured.



VideoStudio offers scene detection, which will automatically break up your video into clips based on recording starts/stops, camera shifting, etc.

There are also several other considerations during capturing, such as file format. DV video offers 2 types, DV Type 1 (AVI type, one stream) and DV Type 2 (AVI, separate video and audio streams).

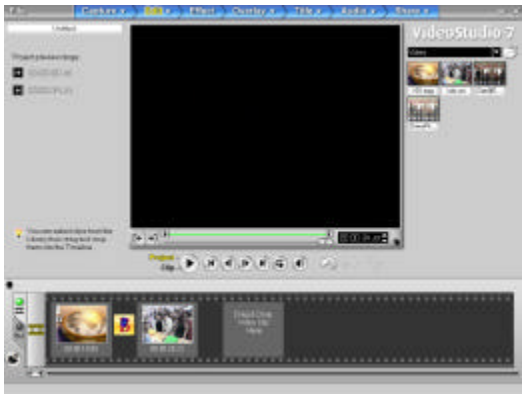
Video can also be captured to MPEG-1 or MPEG-2 formats. Video captured on machines with Pentium II, 300 MHz processors or less, with resolutions of 352 x 240 or less, should output MPEG-1 files. Otherwise, MPEG-2 format is recommended.

Data from analog sources can also be captured straight to WMV (Windows Media Video) formats. In all, 10 file formats are supported.

Options are also available to capture TV footage, split by scene, batch capture and capturing still images.

After the video is captured, the steps that are detailed on the following pages can be performed in any order (editing, effects, overlay, titles, audio). The preview window allows you to test out your editing and other changes, including a quick, lower quality look without fully rendering the video.

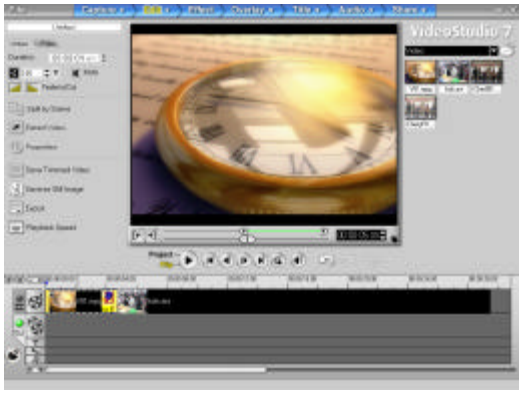
Edit Step



Clips can be arranged, edited and trimmed during the edit step. Editing can be accomplished in storyboard or timeline mode. Click on the Edit menu item to access this feature.

Clips can be dragged and dropped to the storyboard. Clips can be trimmed there and transitions inserted.

The timeline can be accessed by clicking on the tab next to the storyboard. The timeline is useful for trimming and editing the clips, and accessing all available tracks.



The timeline is broken into Video, Overlay, Title, Voice and Music Tracks. Each track can be accessed by clicking on the track's icon.

Clips that have been put on the timeline can be trimmed by dragging the yellow trim handles on either side of the clip. Trims can be made frame by frame by clicking and holding down a trim handle, and using the left or right arrow key. The function keys F3 and F4 can also be used to set trim or mark in/out points.

Video filters can be applied using the Edit Step. Filters allow you to change the clip's style or appearance. Dark videos can be lightened, or colors can be balanced. A maximum of five filters can be applied per clip. The filter effect is selected, and dragged and dropped on to the clip in the video track.

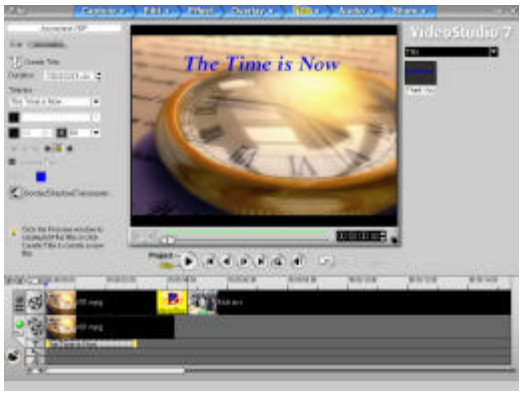
Effects

Transition effects can be added to the timeline between clips. Thumbnail animations can be dragged and dropped to the timeline. Many different effects are available including 3-D, Build, Clock, Peel, Push, Roll, etc.

Overlay

A clip can be superimposed over another one as a special effect in a movie. The clip can be selected from the library and dragged and dropped on the overlay track.

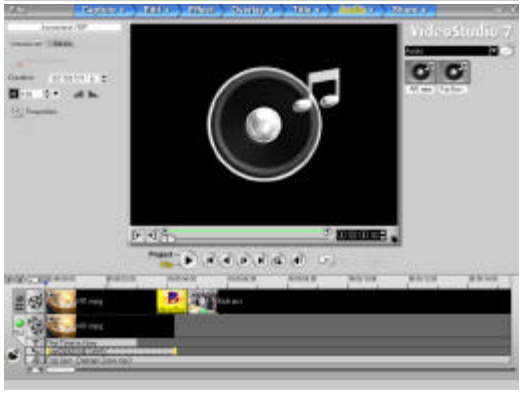
Clips added to the overlay track have an alpha channel automatically applied for transparency.



Titles

Titles can enhance your movie in the opening, as subtitles, and at the closing. Text can be created and animated in any Windows True Type font, color and size.

Click on the Title menu item, then click on create title. The text is typed in the preview window. The text can be formatted and animated, as well as moved to a different position on the title track.

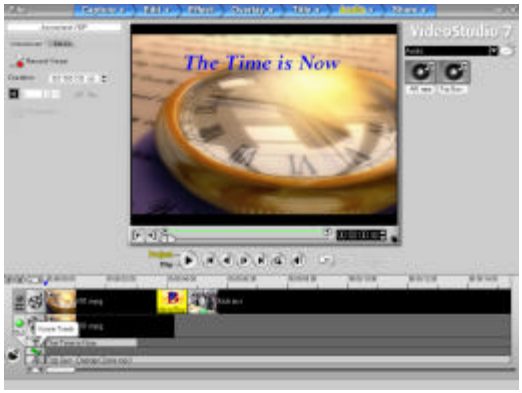


Audio

Audio files can be used to set the mood for your movie. VideoStudio lets you add background music, as well as record narrations in addition to the initial video audio.

Voice Track

The audio track can also be used to record a voice audio track to allow you to narrate your movie. The audio/voice track can be selected and volume adjustments made. The recording is then started and stopped. The recording can be trimmed (using methods discussed previously) and moved to the appropriate space on the timeline. Short (10 – 15 seconds) recordings are recommended, to make it easier to re-record, move, and adjust the narrations.



Music Track

Background music can be added from music files, or directly from CD's. Supported file formats include .mp3, .wav, and others. Music files can be dragged and dropped to the music track. Music can be faded in at the beginning or the end. The music can also be trimmed, in the same method as a video clip, to match to the video clip length.

Share

Click on the Share menu item to access the options to create a movie or DVD. After the desired tracks are complete, the final movie can be created. Again, not all the tracks must be used. The creation of the movie is called rendering. Rendering may take time,

depending on the length of the clips and the tracks used. A new option of rendering changes only is also available.

Your movie can be output as a DVD/VCD/SVCD title, streaming Web page video, or an e-mail attachment. The movie can also be sent back to your camcorder or VCR.

Conclusion

VideoStudio is easy to learn to use, and lives up to its tag line – "Movie Making for Everyone." Even if you choose to use another product, such as Windows Movie Maker, movie making is fun and easier than ever. It only requires some additional equipment, lots of disk space, and your own creativity.

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A *Really* Small Computer User in Education, (About one year later)

Jeff Brodrick
Assistant Director of Research and Technology
Baptist Bible College of Pennsylvania
538 Venard Road
Clarks Summit, PA 18411
(570) 585-9265
jbrodrick@bbc.edu

Abstract

Our Association was originally organized in order to support small computer users in Education. The nomenclature of small computing is making a come back and this time it fits into a shirt pocket! This presentation will review statements and predictions made last year. It will also show the latest benefits of using a pocket computer by demonstrating the practical uses for it in education. The presentation will be given using pocket presentation software on the hand-held computer to a projector.

Adventures of the One ARMed Man

'Memory' Lane

At the Convention of World Future Society in 1977, the President of DEC, Kenneth Olson declared these words. "There is no reason for any individual to have a computer in his home." With the advent of mobile computing this supposed foolish statement is not too far off the mark.

Writing about technology is like writing about vapor over a coffee cup. Here in an instant, and gone just as suddenly. The pocket-pc currently is an evolving breed of computer. Much of this paper may be put the recycle bin within six months. Many of the web sites may disappear, and another pocket pc will undoubtedly have much more to offer next year. Change is a constant.

The hand-held computing device came in the early 80s with the introduction of Radio Shack's "PC-1." Later the "PoqetPad"1 came and it ushered in the PCMCIA (Personal Computer Memory Card International Association) device. Apple's "Newton" made its debut in 1993 with a suggest retail price of $699. Many of these represent the early Personal Digital Assistatnt or PDA. Today, notable brands such as the "Palm," or "Hanspring" are in the PDA category, while the more powerful PDAs are called Pocket PCs. Hereinafter, referred to as the PPC.

This new breed of hand held device exceeds the capabilities of its forerunners by including common applications found on most desktop computers. The entrance of the PPC brought with it anywhere, anytime communication. Frankly, it also brought with it a higher price tag. But, the added value outweighs the added cost.

1 Poquet Computer Corp., developed one of the first MS-DOS palmtops; MSRP: $2500.

Hand-held vs. Pocket-PC

When classifying a *really small* computer, the main consideration is the display. A PPC has a quarter VGA screen (320x240). A hand-held has a half VGA (640x320) or full VGA (640x480, 800x600) screen. A laptop falls into the column of Hand held computer. Laptops are not designed for the ordinary shirt pocket. However, the PPC does a marvelous job of it.

The CPU

The PPC made its debut equipped with Intel's 206 MHz Strong Arm chip.

Operating System

Most of the PPCs come standard with a pocket version of Windows called Windows CE.2 Linux exists for the PPC. Some PPCs can be purchased with Linux already installed. The majority of PPCs are using the Windows CE environment.

Recently, third party developers have made a Palm emulation package for the PPC. This is primarily useful for running some of the older (and perhaps out-of-print) titles for the earlier PDAs aforementioned.

Applications

At the 2001 ASCUE Conference, Applied Business Technologies introduced to attendees of their presentation the use of PPCs and rightly predicted that the "demand for this hand-held device will grow as more education-focused applications are created for these devices."[3]

As of this writing that demand is still increasing and applications for the Pocket-PC are growing exponentially. It is possible to find nearly all of the favorites available.

All of the Pocket devices (including mobile-phones) have some kind of contact/address list. The PPC (with Windows CE) uses full integration with most e-mail systems and includes a Personal Information Manager (PIM), Pocket Word, Pocket Excel, MS- Reader (.lit), Media Player (audio/video), and Pocket Internet Explorer (affectionately known as "PIE").

Popular/Necessary Software Add-ons

Map Applications, Genealogy, Pocket TV, LiesureWare (Games), GPS and Financial products. At the end of this paper please find a listing of web sites that promote thousands of useful software titles.

2 The desktop version of this operating system can be found on the WebTV system, Microsoft's X-box, MSN Web companion and the eBook Reader.
3 2001 ASCUE Proceedings, "Breaking Away From the Desktop: Applications that synchronize PocketPCs and Campus Database Systems. Page 155.

Programming the Pocket-PC

Basic CE
Windows .NET
VB6 (Visual Basic and Visual Studio)
eVB (embedded Visual Basic)

Accessories (to avoid being out-gadgeted)

Memory
- CF—Compact Flash
- SM—Smart Media
- SD—Secure Digital (SDIO)
- MMC—Multi-Media Card

Storage
- Memory cards, Iomega "Drive," IBM Drive (From Megabytes to Gigabytes of portable space)

Styli – single, multi-purpose
Carrying cases (leather, plastic, cloth)
Video Display module (PCMCIA or CF device for displaying PPC on a projector.
Add-ons
- Networking and wireless
- Phone (cell phone add-on) – Phone handheld
- Camera (plugs into socket or slides onto unit for taking moving or still shots)

Using the PPC in the classroom and office

At the beginning of the 2001-2002 academic year, Baptist Bible College and Seminary faculty using the Pocket-PC numbered one. By the end of Winter break that number saw an increase of 400%. In the spring semester the Bible faculty began using the Pocket-PC in class as a ready reference tool. Several versions of the Bible are available including the Greek New Testament and Hebrew Old Testament (their original forms). Beyond this practical use one of the faculty from another department uses his for class attendance as well. Since the Pocket-PC has the ability to recognize hand writing, he has each student write their name onto the notes application. Then later he verifies their attendance. The 2002-2003 year has yielded greatest use.

This staff member introduced the use of "Avant-Go." It is an on-line service, which synchronizes content web pages with the PPC. There are thousands of sites participating in this means of mobile communication.

Since word processing and spreadsheet applications are available, users employ either of these "anywhere" "anytime." The Pocket Power Point programs available implement all of the functionality found in their desktop counterpart. Some faculty members are using the video display capability with a version of presentation software.

Change is a constant?

Much of this paper may find the recycle bin within six months. Many of the web sites may disappear, and once again, the PPC will undoubtedly have much more to offer next year.

Pocketic Justice

There once was a pocket, which had no friend,
Eventually it got to a place at its wits end,
Until one day the Personal Computer became small,
And the pocket was befriended once and for all!

Useful PPC Internet sites:

The latest software:

www.pocketgear.com
www.pocketpccity.com
www.pdacity.com

PPC News

www.pdabuzz.com
www.ppcpsg.com
www.pocketpcpulse.com
www.pocketnow.com
www.pocketpccentral.net
www.pocketpcpda.com
www.mobilecritics.com
www.pocketpcminds.com

1000s of E-books
www.memoware.com
www.mslit.com

Current device specifications:
www.microsoft.com/mobile/pocketpc/hardware/default.asp

Programming helps:
www.deVBuzz.com (since November 2000)

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Pocket PC Summit
www.pocketpcsummit.com

Improving Student Engagement through Technology

Christopher I. Chalokwu
Vice President for Academic Affairs
Saint Xavier University
Chicago, IL 60655
773-298-3191
chalokwu@sxu.edu

Nubi Achebo
Director of Instructional Technology
Saint Xavier University
Chicago, IL 60655
773-298-3884
achebo@sxu.edu

Introduction

Recently higher education institutions have become increasingly concerned about the issue of student engagement in learning. In response to internal and external pressures, university administrators are looking for better ways to keep students focused on academics and to retain larger numbers of students. According to the National Survey or Student Engagement (NSSE) "Student engagement represents two critical features." First, "the amount of time and effort students put into their studies and other educationally purposeful activities; and second, how the institution deploys its resources and organizes the curriculum, creates other learning opportunities, and support services to induce students to participate in activities that lead to experiences and outcomes that constitute student success." This paper focuses on the second aspect of student engagement. The NSSE is based upon the premise that the more students engage in a learning activity; the more learning actually takes place (National Survey of Student Engagement, 2002 Annual Report). Survey items for NSEE were developed according to the following principles of good practice in undergraduate education described by Chickering and Gamson 1987): student-faculty contact, cooperation among students, active learning, prompt feedback, time on task, high expectations, and respect for diverse talents and ways of learning.

Saint Xavier University was part of the initial public offering of NSSE in Spring 2000. The institution also participated in the 2001 and 2002 national surveys. Results from the first survey were mixed; it took the university community by surprise, and challenged long-held institutional views and assumptions about student learning. The institution's low performance on benchmarks for active/collaborative learning and student/faculty interaction especially surprised administrators. Skepticism about the reliability and validity of the results prompted a replication of the study locally. The response rate on this replication was quite high (80% compared to 40% for NSSE), but the result reaffirmed the original NSSE findings. The second year data of NSSE further confirmed the data from the first year.

Catalyst for Change

The university has responded to these results by initiating several changes to address the problems highlighted by NSSE data. Other issues the university wishes to address include the retention of freshmen and assimilation of transfer students into the university community. NSSE has become a vehicle for creating a shared understanding of assessment of student learning and institutional priorities. New initiatives have been introduced in the past two years. Some of these initiatives are anchored by the use of technologies – the redesign of a freshman seminar class to include the introduction of Blackboard content management system to address pedagogical and curricular issues, use of e-portfolio to document and assess student learning, and inclusion of technology in the institution's faculty development program through a competitive multimedia technology integration grant.

Promoting Active and Collaborative Learning

The NSSE findings reveal two areas of concern for the university: active/ collaborative learning and student-faculty interaction. The university currently offers a seminar class required of all students for graduation. The seminar is designed to promote success, to improve critical thinking skills, and to help identify key points in reading and key issues in an intellectual discussion or argument. Seminar activities are designed to improve the ability to develop and support ideas persuasively, enhancing performance and enriching class discussions in all of the courses taken by students in their respective programs.

The institution revised the seminar course in 2002-2003 academic year to include a technology component. A decision was made to provide reading material online for student access. There are two ways to access the document; it can be downloaded as a single PDF document or the student can download relevant portions of the text for each class period. A separate environment was created in Blackboard for each section of the course – there are twenty-three sections in all. The Center for Academic Technology provided training for all faculty members teaching the sections. The workshop section covered the basics of using Blackboard and online teaching techniques.

Feedback from students so far has been very positive. Yet, a few issues related to the implementation of a technology-enhanced course environment for the SXU seminar class remain. Some faculty members involved in teaching sections of the seminar classes are not fully utilizing the environment because of heavy reliance on traditional classroom methods. Some students are still learning how to use the technology and therefore, navigating the course environment and completing assignments online poses problems. These issues are currently being addressed and new strategies will be adopted next academic year.

Blackboard

The Blackboard content management system was introduced in 2001 after faculty evaluated other content management system software. Blackboard was overwhelmingly selected as the official learning and teaching management tool because of the following qualities:

- Easy conversion of data from previous systems into Blackboard environment
- Scalability of the software depending on demand
- Familiar interface
- Integration of several active learning features
- Content sharing and storage
- Assessment tool for self assessment and for quizzes

Blackboard was piloted in Fall 2001 with selected courses from the four different schools of the university – Arts and Sciences, Business, Education, and Nursing. Blackboard was marketed as a tool that can be used by faculty who are familiar with technologies. This group of faculty members was selected as part of the test group. Rollout to the general faculty began immediately after the pilot. As part of the implementation, the Center for Academic Technology organized a series of workshops covering the features in Blackboard and the pedagogical implications of using the tool in the teaching/learning process. Initial response to Blackboard was very positive, and over the course of two semesters, we have witnessed a sharp increase in the number of faculty who use Blackboard to complement traditional classroom instruction (Fig. 1).

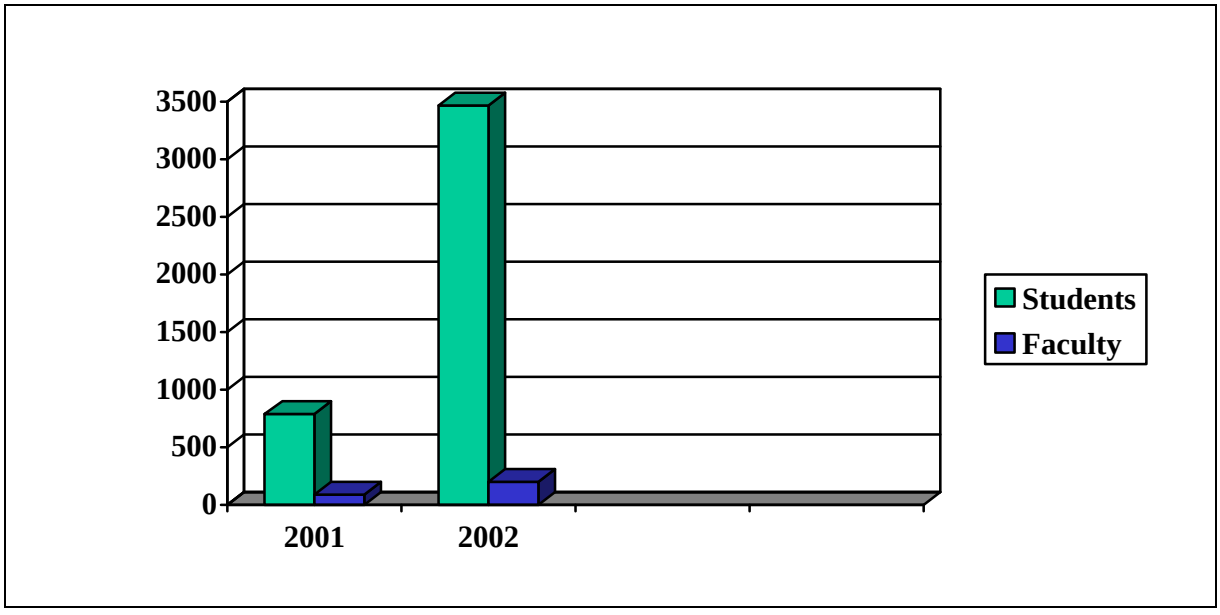

Figure 1

Increased student engagement through Blackboard use is reflected in increases in the number of Blackboard sessions. The number of Blackboard sessions increases when the university is in full session and decreases during holidays (Fig. 2).

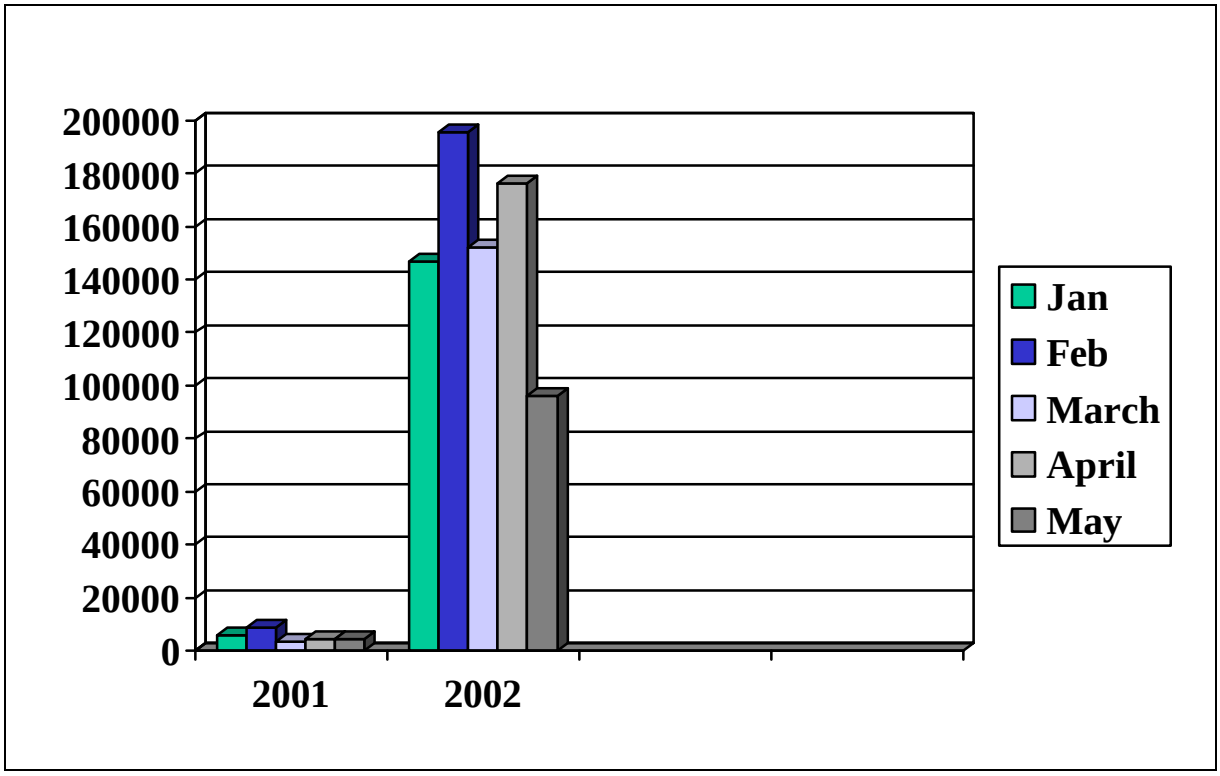

Figure 2

Although Blackboard has an integrated interface that combines several necessary tools for active learning, faculty members do not utilize all the tools. The differences in the use of Blackboard features mirror the skills level of faculty members. Some faculty members are at the early adoption stage of integrating technology into their courses and are comfortable with the use of the document sharing and the announcements feature, while others with advanced skills utilize the more challenging features of the system. Because technology use is mostly incremental in nature, faculty members are encouraged to use whatever features they feel comfortable with to build confidence.

The initial emphasis was on faculty technology workshops for those interested in using Blackboard. The number of faculty attending these group workshops has dropped off significantly over the past year, reflecting the fact that once faculty members are familiar with the basics of Blackboard, they prefer one-on-one consultation session focusing on problems related to the use of Blackboard and in-depth pedagogical issues using Blackboard in the teaching/learning process.

The use of Blackboard for instruction also alerted the institution to issues related to support services, especially the lack of an adequate support program to help students using technology for in and out of classroom instructional activities. The university is largely a commuter institution and receives a large number of students from area community colleges. Some of these students are not technically savvy which has implications for technology use and training university-wide. This issue is gradually being addressed through support from the Learning Assistance Center (LAC) and the appointment of graduate assistants to handle student-training issues.

Web Portfolio

According to Siegle (2000) "One popular strategy for documenting students' learning and accomplishments is the student portfolio. A portfolio of student work across time can provide an invaluable snapshot of a student's current skills, as well as provide an opportunity for the student to reflect on his or her growth as a learner." For the past several years the Saint Xavier University teacher preparation program has been exploring ways to move beyond the traditional model of clinical observation. The Technology in Clinical Practice Program's central emphasis is on communication made possible by new media between pre-service teacher and mentor, pre-service teacher and P-12 students, and faculty mentor/mentee teams. These efforts require intense professional activity in a supported, nurturing environment. The goal of gradual and supported induction into the profession of teaching has long been embraced by accrediting agencies and more recently by the State of Illinois.

In addition, Saint Xavier University pre-service teachers are often exposed to or explicitly taught the use of technology in their methods courses. This program requires the actual use of technology in pre-student teaching clinical experience. In order to remain competitive in the employment market, Saint Xavier University teachers need to be able to demonstrate the use of technology in their teaching

The Technology in Clinical Practice Program is designed to facilitate professional growth in the uses of pedagogical technology by both pre-service and in-service teachers and to build strong educational partnerships between P-12 schools and the Saint Xavier University teacher preparation program. The program emphasizes the value of mentoring and of structured, supervised clinical experiences as key components in the development of new teachers.

The program matches pairs of pre-service teachers (in separate elementary and secondary methods classes) with experienced in-service mentor teachers who will design and implement collaborative projects in technology-enhanced instruction. The pairs of students work with their mentor teachers to develop teaching lessons, which include the use of technologies such as PowerPoint presentations, Web-based assignments (including Web research and critical thinking, Internet communication, and the use and creation of multimedia documents), and subject-specific software. Through a series of three workshops, mentor and pre-service teachers receive training in technologies, which match their teaching situations. Mentor teachers, in consultation with their mentees, select software to be used in the class. Pre-service teachers spend five class periods teaching lessons, under the supervision of both the mentor teachers and the University faculty teaching the methods courses. In order to facilitate communication about instruction, mentor teachers and pre-service teachers communicate using a listserv and methods course website. As part of the final course project assignment, pre-service teachers develop electronic portfolios documenting their knowledge of and use of technology. These activities are planned and implemented in accordance with the program's goals, which have been adopted from International Society for Technology in Education's guidelines for the Application of Technology in Instruction.

Instructional Technology Integration Grant

Technology integration into the curriculum is only possible through strong support from university administration. The university continues to invest in technological infrastructure for both administrative and instructional purposes. Several initiatives have been implemented to encourage faculty use of technology for personal and instructional purposes. While many efforts have been successful in encouraging faculty to use technology, faculty members are not necessarily requiring students to use technology at a significant level. The university currently has a new grant program to support faculty members integrating technology into their courses. This program is administered by the Center for Academic Technology (CAT) and the Center for Educational Practice (CEP).

Faculty members compete for funding through proposals intended to infuse technology into the curriculum and instruction. The grant proposals are reviewed and ranked for final selection by members of the Center for Educational Practice. Faculty members whose grant proposals are successful are required to partner with the staff of the Center for Academic Technology in the design and development of their project. These development activities take place in the Spring and Summer of each academic year against Fall term implementation.

Conclusions

The use of Blackboard course management, web portfolio, and writing software in writing labs can transform the classroom from a passive to an active learning environment. The instructor is no longer seen as the sole provider of information but a facilitator of the learning process through threaded discussions and online mentoring. The result is better engagement of students with the university in ways that increase learning outcomes and retention. As student engagement through the use of technology increases university-wide, the campus IT infrastructure and support services must increase accordingly, which requires additional expenditure. Increased expenditure resulting from a technologically engaged campus is offset by increased tuition revenue resulting from higher retention.

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Developing Information Fluency for the Humanities Student A Collaborative Effort

Mary V. Connolly
Julie Long
Saint Mary's College
Notre Dame, IN 46556
(574)284-4497
connolly@saintmarys.edu

Abstract

Saint Mary's students use a self assessment tool to benchmark their current level of information fluency during their first two weeks on campus. This assessment is not as useful as it could be without resources which allow students to develop their information fluency. Saint Mary's recognized that the College had few resources to meet the needs of those students who will do research in a networked environment but never program a computer. A research librarian and a member of the computer science faculty collaborated to develop a course for these students entitled "Research and Resources in a Networked Environment." This paper discusses the history of the course as well as the goals, content and assignments. The problems faced in implementing the course will also be addressed.

Introduction

When the Teaching and Learning Technology Roundtable (TLTR) was established at Saint Mary's, the steering committee recognized that defining and developing student information fluency (IT fluency) should be a priority. Many hours of work by a subcommittee chaired by Prof. Emeritus Peter Smith led to the development of a self assessment tool which students could use to establish their current level of IT fluency and to plan for enhancement of their IT fluency. This work was discussed in Prof. Smith's paper "Assessing Student Fluency in Information Technology." [4, pp. 222-233] This assessment tool was first used in the fall of 2001, when all first year students were asked to consider their current level of IT fluency. The steering committee of the TLTR, however, recognized that the opportunities available for students who wished to improve their level of fluency were limited. Saint Mary's offers substantial courses in computer science; the Department of Information Technology regularly offers no credit workshops to help members of the community develop skills. In addition, there are work study opportunities for those who wish to work more deeply with technology. However, opportunities for the typical humanities student seemed to be lacking. Such students are usually not interested in taking programming courses nor in working for Information Technology. If they do enroll in a workshop, it is just so that they can learn the skills needed to word process a paper or produce slides for a presentation. This hardly prepares them to be information and technology literate citizens. It seemed clear that Saint Mary's was not meeting the needs of the student who will use a networked environment for her work but never program a computer.

At the same time the discussion on student IT fluency was taking place, reference librarians were indicating that the typical Saint Mary's student was lacking in research skills. There are virtually no first year courses in which students are expected to do extensive research projects. More

typically, these projects are required in the junior or senior years. Students arrive in the library looking for help, with no good idea of how to identify and evaluate printed materials, much less those found in electronic form. While our students are indeed proficient in e-mail and ordering items on line, they have received little training in how to efficiently find information in a networked environment, how to evaluate this information and how to incorporate it in a research project.

The TLTR steering committee saw a golden opportunity to develop a course which would explore the nature of research in a networked environment and help humanities students develop their IT fluency in appropriate ways. Julie Long, a reference librarian who serves on the TLTR steering committee, and Mary Connolly, from the computer science faculty, joined together to develop the course, supported by an internal COSTAR (Collaborative Study and Research) grant from Saint Mary's.

Course Content

The course is intended to be a project-based one, consisting of lectures and demonstrations culminating in a web-based portfolio exploring one of the themes of the course. It includes: a study of the evolution of the networked environment; a study of the ethical issues involved in being part of a networked environment; searching, accessing and critically evaluating resources; a review of copyright and citation issues; and publishing on the Internet. The course carries one credit; classes meet once a week. Class time is not devoted to building skills. Students develop the necessary skills, such as learning how to use the required software packages, outside of class time, with the help of specially selected student tutors.

The first class is devoted to computer basics, making sure that students know the essential vocabulary. Students work through an activity in which they find the answers to questions such as:

> How is computer memory measured?
> What kind of files consume more memory, on average, than graphics files?
> What is meant by bandwidth?
> How is the clock speed of a computer measured and what does it mean?
> What is the typical memory requirement for one small drawing?
> What is the typical memory requirement for one three minute music file?
> Which might speed up your computer - more RAM or a larger hard drive?
> What is a ping value?
> What does it mean to download a file?

While we assume that the students have been using computers for years, our experience shows that many do not really understand why their computer might be slow, why they should know something about the operating system on their machine or even what they should look for in purchasing a computer. This first class is designed to help answer these questions.

The second class is devoted to Internet basics. Students learn how a DNS address is constructed. The client/server software model is explored, and the World Wide Web is discussed. Students,

of course, have been on the Web for years, but we try to give them some hints to make their browsing more efficient. Another activity is introduced in which students answer questions such as:

> Why is the heterarchical structure of the Internet a better organization structure than a hierarchical structure?
> What is the difference between an IP address and a DNS address?
> What is the first thing you should try when you see a 404 Not Found error message?
> What is the College's Computer Usage Policy? Note: This requires students to find it on the Web.
> What is the term of the day on www.webopedia.com?

Students are assigned readings on information to prepare for the next class. [3, pp.3-20], [5,pp.31-50], [6,pp.27-29] In addition, the semester long project is begun. The project is divided into seven milestones; the first, due at the beginning of the third class, requires that students select a topic for an essay. Guidelines are given so that the essay will be in keeping with the themes of the course.

The third class explores the nature of information. Working through an activity, the class develops a shared definition of information and explores the differences between data, information and knowledge. The information cycle is presented, and students are asked to keep a journal of their information needs over the coming week and how they solved them.

The next class fully explores the need to evaluate information found on Web sites. Students look at educational sites, commercial sites, governmental sites, organizational sites, biased sites and bogus sites. An evaluation check list is used to rank the usefulness of five sites in finding biographical information on Shakespeare. Search engines are explored, and students must find four Web sites related to the topic of their essay using at least two different search engines. To complete the second milestone of the project, students must evaluate the four sites, using the evaluation check list.

By the next class, students should be able to present some of their Web site evaluations. The class then explores the various types of electronic resources and differentiates between these types, i.e. Web sites versus Web-based databases, periodical indexes versus online catalogs, etc. Students become acquainted with electronic journal indexes and learn how to classify sources as primary or secondary. They also classify periodicals as scholarly or popular; our experience has been that we need to do this. Students do not necessarily understand the difference. Online catalogs are also considered. A succession of activities helps students understand these concepts; they categorize a variety of publications and defend their decisions. Other activities help students learn how to structure an effective query. The activities are spread over two class periods. For the third milestone, students are required to use at least two different periodical indexes to find four articles related to their essay topic, at least two of which must come from scholarly journals.

The next two classes are devoted to copyright laws, fair use and proper citations. An interesting class activity at this point explores identifying plagiarized texts. For the fourth milestone, stu-

dents are required to prepare an annotated bibliography of the articles they will use for their essays. The fifth milestone consists of the written essay.

The next part of the course introduces students to the principles of visual communication. Students will eventually create a Web page for their project (milestone 6), but first we want them to be introduced to good design principles. At this point we consider symmetry and balance, proper utilization of space, texture, color, unity and variety, etc. Class time is spent looking at a variety of Web sites, some well designed and some which need help! The basics of HTML are introduced before students learn to use Dreamweaver. All of this takes about three class periods, with additional help from the student tutors outside of class. A fourth class is devoted to graphics and animation. The last class is devoted to the final milestone – presentation of each student's project.

Problems

Although it is clear to the reference librarians and the faculty that many humanities students really do need to work through the material of this course, students do not necessarily feel they need to, until that senior project is upon them. At that point, the librarians are giving a good deal of one-on-one help. We were first given permission to offer this course in the fall of 2002. We initially felt that the course should be restricted to first year students, since those students would probably not have other research projects during the semester. Since the course is a one credit course, we decided to start it just after the two session introduction to information technology which is required of all first year students and takes the first two weeks of classes. The problem was that by the third week of class, no first year students felt like adding another credit hour to their schedule; they were sufficiently overwhelmed at that point! Hence, we did not get to teach the course.

For the spring semester we opened the course to students of all four years. However, we did not do a good job of making this new course known. Although several advanced computer science students noticed the offering and asked questions, the humanities students ignored it. Once again, we did not have enough students to run the course.

For the fall, 2003 semester we are advertising the course in a number of ways; as of early March we already had interest. This time we do expect to teach the course. At this stage, it is still considered an experimental course. Should we be successful at attracting the numbers of students we hope to attract, we have several problems ahead of us. Since this is a collaborative course, both instructors are essentially carrying the course as an overload. There currently is no formal way for a reference librarian to teach a course; while such work is entirely appropriate and has been done in the past, it does put a burden on the person involved. One credit hour courses are difficult to fit into the standard faculty load at Saint Mary's, since the usual load is three 3 credit hour courses one semester and four 3 credit hour courses the other semester. We recognize that over the long term, we can not expect the same people to fit this in every semester as an over load. Also, we would love to get to the point where we needed more than one section. Another unresolved issue is which department should claim the course. We have been reluctant to list this as a computer science course since the intended audience is definitely not computer science

students. Currently, it is listed as a special course; however, if it is to be made permanent, it will need to go through a review process and be claimed by a specific department.

Looking Ahead

In many ways, our students will help us with IT fluency. Each class comes to Saint Mary's more computer literate than their predecessors. However, most do not understand the implications of working in a networked environment. Although most students have spent a good deal of computer time surfing the Web, shopping, sending messages, etc., they still need help in learning how to use technology for the real work of an academic. While the content of this course may change in years to come, it seems clear that the need for such a course will remain.

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A Practical Approach to Teaching Technology

Deborah Dunn
Assistant Professor, Computer Science Department
Stephen F. Austin State University
Nacogdoches, TX 75961
(936) 468-2508
ddunn@sfasu.edu

Ron McCallister
Assistant Professor, Computer Science Program
Tusculum College
Greeneville, TN 37743
(423) 787-7300
rmccalli@tusculum.edu

Introduction

For over a decade, Tusculum College has engaged in a process of examining and reviewing its programs which has resulted in a significant and far reaching transformation of the curriculum and the campus culture. Under the heading, *Civic Arts*, five principal reforms have been inaugurated since the fall of 1991, one of which is the Focused Calendar, where all courses are taught one at a time for the duration of 18 days. The most significant advantage of this calendar for the computer science field is that it gives more opportunity for hands-on exercises and collaborative learning. Although few schools utilize the focused calendar, many schools have short summer terms and a growing number of schools are introducing four week winter terms. The lessons learned and creative teaching practices employed at Tusculum may be used at other institutions. This paper will focus on the pedagogical innovations which have resulted in a significantly unique way of teaching information systems and technology to Business Administration majors, which exploits the focused calendar environment.

The Focused Calendar

The focused calendar is often referred to as the "block program" at Tusculum College, primarily because courses are offered in "blocks" of time. Each block consists of an 18-day period, during which courses meet a minimum of three hours per day (giving a total of 54 contact hours). Students take one course at a time and faculty members teach one course at a time. The most significant advantage of this calendar for the computer science field is that it gives more opportunity for hands-on exercises and collaborative learning.

As is probably true in most disciplines, there is an extensive amount of material to be covered in the computer science courses. Although it might be possible in some disciplines to deliver the necessary material in a lecture format, computer science courses are traditionally so "knowledge intensive" that the idea of conveying the information in a series of three-hour lectures is unreasonable. In addition, the amount of time for absorbing the material, as well as for problem-

solving and critical thinking is condensed into an 18-day stint. Because of this, the faculty had to become more innovative in instructional methodologies.

The Business Administration Course

One of the core courses for all Business Administration majors is the Management Information Systems and Systems Analysis course. The service course offered to our Business Administration majors is one of the courses in which we can effectively make the most of the focused calendar by utilizing a significantly unique way of teaching information systems and technology. The course, although part of the curriculum for business students, is taught by the faculty in the Computer Science department. The prerequisite for the course is a demonstrated proficiency in those packages which make up the Microsoft Office suite. Students may demonstrate this proficiency by taking a course or by passing a test.

The growing acceptance and use of technology in the business world has placed additional demands on those entering the field. Early on, the Business Administration department of Tusculum College recognized this need. This course is our attempt, at a minimum, to expose students to the concepts, terminology, and basic skills required to be an active participant in the management of an organization.

The Early Version

The Business Administration course, at its inception, was entitled "Systems Analysis". The course description was as follows: "This course will deal with traditional analysis, design, and implementation through data flow analysis and systems development life cycle approach. Methods for structured analysis and design will be covered." The course was designed not only for business majors, but was also part of the curriculum for Computer Information Systems majors and minors. In 1995, a new upper-level Systems Analysis and Design course was instituted for the Computer Information Systems and Computer Science majors, thus relegating the original course to Business Administration majors and those students wishing to minor in Computer Information Systems.

In 1999, several changes occurred in the curriculum. The students with a minor in Computer Information Systems were now required to take the upper-level Systems Analysis and Design course, rather than the course offered to Business Administration majors. In addition, the course description and objectives of the business course were modified.

The changes in the course were made for a number of reasons. Prior to 1999, the course was taught truly as a Systems Analysis course. Students spent the bulk of the time working on the design of a system. This design involved things such as data flow diagrams and input and output design. It was the belief of the then current members of the Computer Science department that this was not the kind of experience that our business students needed. We believed that they would gain more (and their future employers would gain more) by having the students learn about information systems and how they could be used in the management and administration of a business. In addition, an examination of the curriculum for a number of other institutions fur-

ther confirmed our belief that the focus of the course needed to be redirected to more accurately reflect the kind of experience we felt our graduates needed to carry with them.

The New and Improved Version

The first step was, of course, to change the course information in the college catalog. The course name was changed to "Management Information Systems & Systems Analysis". The revised catalog description of the course is as follows: "An introduction to information systems and information technology for business students. The purpose of this course is to help students learn how to use and manage information technology in order to improve managerial decision making and gain competitive edge. Methods of developing information system solutions to business problems using structured analysis and design will be covered. Emphasis is on using spreadsheets and databases for problem solving."

The second, most important, step was to completely overhaul the course itself. One of our goals was to design a course which more realistically mimics the real-world environment, especially for business students. Another goal was to design the course such that it would actually exploit the focused calendar environment. In a calendar environment which is sometimes not conducive to teaching technology, this type of course could flourish. The focused calendar provides substantial opportunities for conveying the necessary information and, at the same time, presents considerable opportunity to provide a more practical approach to the material.

Course Objectives

In many respects, the high level concern in this course is getting those students interested in entering the business arena to understand the importance of data collection and manipulation. To this end, the course objectives require that students learn the basic concepts necessary to be actively involved in management decisions relating to technology. And while a conceptual basis is very important, a more hands-on approach is beneficial to the student's understanding. In many respects, this is where the focused calendar affords the greatest advantage. Adding a significant project, or in this case a series of projects, has greatly influenced both student interest and understanding of the concepts covered.

Theory and Practice

There are two main objectives in the Management Information Systems and Systems Analysis course. Exposing students to the theoretical components of technology in the business environment is, of course, of paramount importance. Having a common terminology and concept base is a must when considering current practices of managing information in the business world. This is accomplished by asking a few leading questions. Why is data important to businesses? How can a company strategically utilize data to give a competitive advantage? How have organizations typically utilized technology to gain this advantage? What hardware and software is required? How do you determine a cost-benefit or cost-prohibition to these resources?

As previously mentioned, a basic understanding of these concepts is important. However, students – and indeed most prospective employers – are mostly concerned with how this will bene-

fit them in the real world. While understanding the importance of a scheduled report or the elegance of a cleanly designed database is "all fine-and-well", giving the students an opportunity to implement these concepts in a capstone project provides a wonderful learning tool. As this course is the only required technologically-based business course at Tusculum College, the project is billed as a capstone experience – even though this is merely a sophomore-level course. As stated earlier, the prerequisite for the business course is a "Computer as a Tool" course that covers the basics of the Microsoft Office suite. The scope of the project assumes that students have a fundamental, working knowledge of Microsoft Word, Excel, Access, and Power Point. The project tests this proficiency in many respects.

The project takes the form of a hypothetical organization seeking an MIS team to spearhead a new initiative within their organization. Students are split up into teams of between three and five per group. Each team will compete for the contract, and indeed their grade. The project is constructed in stages, each focusing on one component of either the MS Office suite or a web-based interface. Each phase leads into the next one, with the overall capstone project being kept in focus.

For example, phase one of the project requires the students to do some MIS research and formulate a plan of action to solve the problems posed by the hypothetical company. The format of the plan of action is specific and tests proficiency with MS Word. The second phase requires the students to begin gathering data using MS Excel. Here they must also do some basic data manipulation to demonstrate their understanding of the more intermediate functionality of a spreadsheet program. Phase three requires the students to import the data collected in phase two into a database program. We decided to incorporate this transition phase to highlight the fact that the move from a spreadsheet environment to a database structure is not, in many cases, an insurmountable task. Once the transition is made, students then begin their data management tasks in earnest. During this time, students work on such issues as data collection via a user interface, and running queries against the data to produce executive, demand (ad hoc), scheduled, and exception reports. The fourth phase requires that students incorporate an Internet presence for the mock company. This work requires the student to complete an on-line ordering system and other e-business necessities. The final phase of the project is the capstone presentation. The students must present each of the phases to the executive board of the hypothetical organization. We invite members of the college faculty to participate in these presentations as company board members, which creates an atmosphere of authenticity and anxiety to each of the groups.

Project Observations

As expected, the final few stages require the most amount of time. Students are given the project very early on in the class. One of the advantages of a "staged" project is that students are forced to work towards an end result on a constant basis. With a phase of the project due each week, procrastination is a vice that hurts students early and often. The scope of this project is intentionally ambitious. As everyone who has worked in the business world can attest, it is certainly not unusual for organizations to create or inherit projects that seemingly cannot be finished by a given deadline. At first blush, this seems to be a liability of such a large project; however, we chose to view this as part of the learning process. Perhaps the best lesson in this technologically-

based course has nothing to do with technology. The need to manage time effectively and delegate group member responsibilities becomes of paramount importance early in the project life.

It is important to also credit the focused calendar for some of the successes found in this course. Having three hours a day for eighteen days allows for considerable flexibility and one-on-one interaction between student and faculty. We have often dedicated entire class days to project work, thereby allowing students to hit predictable barriers with their project and have direct and immediate interaction with the teaching faculty.

Outcomes

This revised course is still relatively new, having been in place for about three academic years. As expected, some students do not like having such a large project; however, the project has become easier for students to accept once the decision to break it up into phases was made. No formal institutional research was conducted to determine the outcomes on a class-by-class basis; however we do have some anecdotal evidence that the course is useful to students and employers. The class critiques have been very positive. We often receive responses on evaluations that say, "this was the hardest course I have taken; but I learned a great deal." We have even had both students and employers contact us to express their appreciation for the experiences gained in the course.

Evolution of the Project

Whenever academicians attempt to incorporate a new approach to an existing class, lessons are learned. The first attempt at utilizing what we call a "staged" capstone project involved students working as teams competing for a contract with an upstart on-line e-book reseller. Some of the details were provided for students such as cost levels for particular categories of books, what web sites to "mirror", and what specific reports would be required by the organization. In fact, very detailed instructions were given as to the construction of the database and the web-interface, even including what to name individual tables and what fields should likely be included in each. Upon the completion of one cycle of courses using this project, we reviewed what aspects of the project went well, and what needed adjusting.

It became evident early on that, in fact, we had two main areas that needed to be reviewed. First, we felt that too much guidance was provided on the details of the spreadsheets, database, and web-interface. We believe that there are many scenarios in the business industry where minimal guidance is given for project work, and it is up to the design team to exceed expectations even if they may be unclear as to the details of those expectations. The second, and in many respects more important, component reviewed was the amount and nature of required research to complete the project. It was decided that a much more significant research component would be added to the second iteration of the project.

Project II: The Revenge

With lessons learned, we set forth to create a more rigorous project. In this project, students were to design a parcel flight service that would allow users to go on-line and schedule the send-

ing of packages to destinations within the continental United States. The students were told that they had a fleet of specific airplanes (for example four 727's, one 747, five Embrear 125's, etc). The students were then told that among the issues that they must address in their project were where their major airplane hubs would be located, the number of flights needed to and from cities, flight routing (meaning determining and tracking multi-leg flights), a cost analysis of shipping packages in this manner, and other issues related to the physical requirements of such a company. Students quickly found themselves doing research on the cargo and fuel capacity of Boeing 727's and on which airport locations afforded the best access to those cities most desired. To say that the project addressed our concerns about adding a research component may be an understatement.

Current Assessment and the Future

The second project adequately dealt with the issues that arose from the first iteration. In fact, we may have gone from one end of the spectrum to the other. Students struggled through the project with some level of frustration as to the seemingly endless need to do more research to make informed decisions about project needs. Immediately following the completion of the course, our first blush assessment was that we had set the bar too high. Even the best students complained that the project was too much to expect in such a short amount of time. However, one fascinating aspect of the course was revealed when the department reviewed the student's assessment of the project. Almost unanimously, the class felt a great sense of accomplishment in what they had produced. They all noted very high learning outcomes in the practical components of the class. Their comfort level with spreadsheets, databases, and basic web design were, we believe, higher than previous sections of the same course.

Will we change the project in the future? Almost assuredly, yes. But those changes may not necessarily involve reverting to a variation of the first type of project. As we all know, the pedagogical benefits of establishing a high level of expectation, while providing the support, time, and access to reasonably accomplish the task at hand is a worthwhile pursuit.

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Past→Present→Future: The Place-and Case-for History in the Information Technology Curriculum

PK Ebert
pkebert@mail.maconstate.edu
Jacton Opiyo
jopiyo@mail.maconstate.edu
Macon State College
Division of Information Technology
100 College Station Drive, Macon, GA 31206
478-757-7088

Abstract

Often, Information Technology (IT) curricula omit addressing historical context of technological developments. When they occur, these omissions often are defended with one of three justifications: 1) IT can be taught, understood, and applied without benefit of any historical context; 2) IT instructors are not professional historians and, therefore, are not qualified to teach history; or 3) There is not enough time in a typical IT curriculum to teach history as well as technological applications. Rejoinders to each of these justifications educe a roadmap for including the study of historical context at all levels of study in the typical IT curriculum.

Introduction

Even if we could convince students that the things we teach are indeed useful, why should that make it interesting to them? We have sold Information Technology short by presenting it only as "the art of science", since the mere utility of a subject does not necessarily generate any excitement for it. For many the excitement comes from the creative, artistic aspect of the subject, and its intellectual fascination.

Another serious drawback to the traditional IT approach is that it deprives students of the sense that Information Technology is a process. On a small scale, modern textbooks and typical methods of instruction fail to illustrate the way the pioneers and inventors actually struggled as they thought out and worked on technological devices and ideas. On a larger scale, IT students are deprived of the long-term process by which a theory/device emerges from struggling with one or more central problems, often over many centuries. These processes, however, are the very things that It students need to understand. No wonder that so many people, even those who have had a fair amount of Information Technology in college, are incredulous when one tells them that, yes indeed, there is a lot of research going on in present day Information Technology, and that this is what really makes Information Technology tick. They have only seen a seemingly petrified structure, with no remaining trace of its creative human origins, and all at least 100 years old.

Too often, IT curricula do not include information on and discussions of the historical contexts that influenced—and were influenced by—information technology development. Arguments offered in defense of omitting history from the IT curriculum can be summarized in three broad reason categories: No Relevance (IT can be taught, understood, and applied without benefit of any historical context.); No Competence (IT instructors are not professional historians and, there-

fore, are not qualified to teach history.); No Time (There is not enough time in a typical IT curriculum to teach history as well as technological applications.). Thoughtful analysis leads to the conclusion that none of these broad reasons should justify omitting historical context from the IT curriculum.

No Relevance

IT owes much to the work of predecessors, not just in the obvious way, but as an ongoing source of inspiration for contemporary research: There are still many insights to be found in the work Turing, and even as far back as Abacus. For novelists, poets, painters, or philosophers such observations would be old news, since their disciplines have long recognized the importance of studying the original work, techniques and perspectives of classical masters. And in so doing, they are never removed from an understanding of how people have struggled, and have created works of art. Young artists thus see themselves as part of a creative tradition. Unfortunately, too many IT educators have lost this sense of tradition in the discipline. Ironically, much of this loss can be blamed on the dazzling explosion of Information Technology in this century. It is time to step back from our accomplishments and recapture a historical perspective.

In the last century, remarkable developments in IT illustrate the inextricable interweaving of technology and social structure. From Marconi at the beginning of the 20th Century to "chads" at the end of the 20th Century, to live broadcasting of the attack on Iraq, understanding information technology requires understanding social order, and vice versa.

Marconi said of his wireless communication experiment of December 12, 1901, "The result meant much more to me than the mere successful realization of an experiment. . . . I now felt for the first time absolutely certain that the day would come when mankind would be able to send messages without wires not only across the Atlantic but between the farthermost ends of the earth." (Rhodes, 1999, 32)

Steve Erwin of Judicial Amendment Coalition, Inc. says of the 2000 presidential election, " The 2000 Presidential Election in Florida was a major disaster that made us the laughing stock of the entire world, almost created a Constitutional crisis, still has many questioning the legitimacy of Bush's presidency, and has others claiming that the election was decided by a Republican Supreme Court." (Erwin, 2002)

And, Walt Zwirko of The Freedom of Information Center notes that journalists embedded with troops during the U.S. attack on Iraq have changed world perception dramatically: ". . . the reporters, photographers and cameramen, far from the Central Command briefing center in Qatar, provide an element that was absent in coverage of Operation Desert Storm in 1991, when war reporting was subject to strict military censorship and the Pentagon limited the images of conflict to successful attacks on enemy targets." (Zwirko, 2003)

Alternative forms of information technology hang in relational vacuum without an understanding of their progressive development and historical contexts.

No Competence

If it were just a matter of informing our students that "all this comes from somewhere", then the usual remedy of offering a course on the history of Information Technology (and maybe making them take it) might at first thought seem enough. But such courses tend to marginalize and eviscerate the very subject matter they champion, generally talking about Information Technology without actually doing Information Technology

Neither will it suffice simply to add historical biography or commentary to Information Technology courses since, while such add-ons may provide a human dimension to the subject matter, they shed very little light on Information Technology. Instead, it is necessary to integrate firmly the study of original pioneers and inventors/inventions into all IT courses, presenting these sources to motivate the modern technologies they have spawned. Study of original inventions of the past is essential in order to understand where the subject came from, how it is currently evolving, and where it might go. As the mathematician Abel noted, "It appears to me that if one wants to make progress in Information Technology, one should study the masters and not the pupils." (Calinger, 1994, iii)

According to the staff of the History News Network (HNN), the majority of people responsible for studying and writing history are not trained historians (HNN Staff, 2003). Indeed, HNN argues, historians are observers of reality. The best historians are often those people who do not think of themselves as historians, but, rather, as reporters of observed reality.

Richard Vinen maintains that "The best history is written by non-historians" because non-historians have no hidden agendæ (Vinen, 2001). Vinen quotes George Orwell (author and political satirist), Bernard Cohn (anthropologist), Teresa Toranska (choreographer), and Zdenek Mlynr (political reformer), among others, to illustrate his point that the most accurate historical descriptions come from people not interested in writing history.

Both Edgar Governo's "Historian of things that never were" web site (Governo, 2003) and David Kosalka's "Historian Underground" web site (Kosalka, 2002) emphasize the value of proletarian approaches to history. Even the Smithsonian Institute encourages everyone to be his own historian (Smithsonian Institute, 2003). And, our personal favorite history, Hawking's A Brief History of Time, is the work of a remarkable man who, challenged by Lou Gehrig's disease, must communicate with the world through a computer and voice synthesizer.

If all of these non-historians have found the means to consider history in their various worlds, surely the typical IT professor can handle it as well.

No Time

During the past few years, many schools have used a course on perspectives on the history of computing with a wide variety of students: undergraduates from different disciplines at all levels. The results have been extraordinary. Students begin to view Information Technology in a new way, and also see themselves differently in relation to it. Information Technology is no

longer a collection of arcana, unrelated within and unconnected to anything without, but becomes a whole, an artform.

So how can one use history in IT teaching? Certainly almost every invention is built upon a succession of preceding ideas. And as one goes back along this chain, the motivation for a problem which started the journey becomes ever clearer, with several works in the chain often standing out as milestones on the road toward our present knowledge. By working through these original inventions which discuss and solve, or attempt to solve, antecedent problems, students discover the roots of modern solutions, ideas, and concepts, even whole subjects. They also see the obstacles that earlier thinkers had to clear in order to move ahead, and thereby gain insight into current technologies and how to approach them.

Then why not read a modern text that lays out this grand scheme? Why study history? For two reasons. First, by including history the students are brought as close as possible to the experience of inventions, without an intermediary interpreter. They see and feel the tenacity, the false starts and triumphs of its practitioners, the salient leaps which revolutionize fields and lead the way to the next cycle of tumult and passage.

The second reason is more subtle and perhaps derivative of the first, but profound nonetheless. When students are exposed to the historicity of inventions they are initiated into the way Information Technology is practiced: through research, publication, and discussion. So students too should read papers from their edge like the Turing test by Alan Turing. Students can then research in a combination of individual work, small groups, and whole class exploration, after instructors preface student reading with an overview and alert them to particularly difficult parts. Discussion gradually will spread to the whole class which then reconstructs the argument, ponders the consequences of the result, and asks "Where do we go from here?" This emulates in large part the dynamic of research in Information Technology. Students understand that instructors believe in them enough to ask them to confront the sources as we would, and their response to this faith is manifest in the heightened intensity of their motivation and study, and in the spirit that drives their work.

Conclusion

What relevance does this approach have to the typical current undergraduate IT curriculum? IT courses often have required material that needs to be "covered" for use in the next course down the line. These requirements should not—and need not—stand in the way of providing real intellectual motivation for the material at hand. Students can benefit in both understanding and motivation from seeing firsthand the building of the first computer, the creation of the first computer company, the naming of the first computer programmer, the struggles of Babbage, investigating the History of Calculating which is rich in its appearance and can be inspected from many different angles.

There is in fact a vast supply of sources that illustrates and brings alive almost every concept taught to students at any level. If resource materials are carefully chosen, history of information technology can be accessible to and highly enriching for both students and instructors. Excellent original sources can be found on websites.

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"Can You Hear Me Now? Good!" Using Webcams and Blackboard to Create a Virtual Classroom

Myrna Finn
Professor
Theatre and Speech Communication Department
Salem State College
Salem, MA 01970
978-542-6937
mfinn@salemstate.edu

What happens when technology is pushed to its limits and creativity is harnessed in the service of education?

Spring 1999, I had a sabbatical from the Theatre and Speech Communication Department at Salem State College ostensibly to create a text on Interpersonal Communication. I am always interested in educational innovation in general and was particularly interested in online or distance learning. Teaching and learning on the web fascinated me. I spoke with a colleague prior to my sabbatical about creating a hybrid course using the web as a resource and he threw out the idea of creating a course that I could then burn to a CD and then teach using the CD. From his idea I somehow leapfrogged to developing a course that would be taught totally online in real time. My idea about the Internet and technology at that time was that if you could think about it, it probably existed. So undauntedly, I began to research ways of teaching this course online in real time.

Since I am not technologically oriented, I began to seek out others at Salem State College who could help me with this endeavor. I approached the Media Department at Salem State College and spent hours and hours with my colleagues there searching out tools that would allow me to create an online course in which there would be two way audio and two way video. There were web conferencing tools, but they only allowed a limited number of people to converse and were often very costly and I had no funds at the time. We finally tripped over a platform that was free at that time and that provided exactly what I was looking for. At that time, it was called CUSeeME and it was free. Now this was a find! (Subsequently, two years later, that free software was no longer free and it now costs to use what they have created. More about that later.) With this program 12 faces were visible online, so that meant a class of 11 students plus me. It was everything I envisioned. So now I could create the course.

Since I do not have web design skills, I sought out the web designer at Salem State, Christine Geiger, and enrolled her in my project. She was most gracious and willing to help me out and so the two of us set about designing and creating a course that could be taught online using two way audio and two way video.

What does it take to develop an online course?

It takes a lot of help, a lot of time and a lot of creative thinking.

Putting a course online and making it interactive, inviting, exciting and creative is a team effort. At Salem State College I used whoever voiced a passing interest in helping out. The Media department was instrumental in helping find the platform, the IT department was instrumental in helping me design the course and a student intern was most helpful in designing the format and some of the materials we used.

No project is worth its salt unless it has stumbling blocks and this project fit very well within this parameter. The web designer, Christine Geiger, who was instrumental in putting this course into Dreamweaver format left the college midway through its creation. This was the biggest and most serious blow to me as she was not only helping me put the course on the web, she also turned out to be a font of knowledge in terms of educational soundness. Christine and I worked closely in terms of making the content come alive for students and she was someone with whom I could bounce off ideas and brainstorm the best way to present information and material. Her leaving the college left a big, gaping hole in this project. What was I to do and there was no one else at the college able to help me. Fortunately for me, Christine was intrigued with the project, thought it was unusual, creative, and challenging and decided to stay with me throughout its development and implementation. She signed on as a consultant, and contributed far more of her time and energy than the small amount of reimbursement that I was able to procure for her as a consultant.

The Internet bubble burst. CUSeeMe which was once a free platform was now a software product that you had to pay for. In the cyberworld reshuffling dance, this product was bought by Quicknet, changed its name to CUWorld and charged a fee for its use. We were then faced with the question of how could we justify having students pay for software. We then thought about the cost of textbooks in general, realized how high they were and concluded that the cost of the software was actually less than many text books, so we were able to resolve this change.

For this course to run online, technical requirements had to be met. That limited the type of student able to take the class. Thus the class was not for everyone. Students would have to have very good computers and very fast Internet connections for this to work. Students without computers at home weren't the best candidates for this class.

Salem State College did not have the facility to offer students technical support outside the college. Students were left on their own to figure out what went wrong when something went wrong and in cyberspace, there is always something going wrong that needs to be fixed or tweaked. Students therefore would have to be brave and resourceful.

Design Concerns

Once you go the visual route as the main vehicle of educational delivery, then you need to deliver. How can we EVER compete with the movies???? The question, therefore, became "What is visually engaging that would hold students' attention and make them want to explore and be curious about the content and subject matter?"

The Sesame Street factor emerged first – college students brought up on Sesame Street expect some visual delight and change every 90 seconds. Therefore, if movement or change does not

happen every minute and a half, most of the audience is lost. We see this in the classroom, this will also be a factor in online courses as well. We had to take in what their visual world and expectations are, and measure up in some way. Otherwise, we would get them all sleeping over their computers.

Since this is an interactive course and we are well aware of students' attention spans, we needed to find good quality digitized pictures and videos to enhance the content of the course. We found or created MP3/videos that kept students awake and interacting. We used streaming videos found on the net to enhance and enliven the material. We also created our own videos. During the summer we gathered various people in and around the Salem State campus and created vignettes that highlighted various aspects of interpersonal communication which students could then view and discuss. The Media department filmed the vignettes and then optimized it for web use.

The use of two platforms for course presentation became problematic. Students were using two screens, one for the course website that was located on Blackboard and one for the webcams that were using CUWorld. Toggling between these two screens became an issue. As computer savvy as students are on one hand, they are challenged on the other and what I assumed they knew and could do, was just that, an assumption!!!
Presentation of course material had to be carefully planned out in advance. What we are able to do on the spur of the moment in the classroom is not as easily accessible online.
Therefore each class session was carefully designed with an eye to making it content rich and visually appealing.

Is group interaction really possible online? The creation of this course had an oxymoronic aspect –an online course in Interpersonal Communication! The nature of the course is that it is interactive and experiential – ideas and concepts are presented and students then discover and uncover their own skills, abilities, strengths and challenges by interacting either in large or small group situations. Was it even possible to carry a face-to-face concept over to an online course and obtain the 1:1 or small group interactions?

The course was taught online in real time, we all logged on together. Chris or I created the room in CUWorld and the students could then log into this room. So we were the ones creating the space for the class to occur online. In order to experience interpersonal communication, we all had to be there. With the latest version of CUWorld, 1:1 and small group interactions are possible as students are able to create their own private rooms.

The inception of the course

Eleven students signed up for the course. I spoke with each of them over the course of the summer to make sure that they had the necessary technological requirements as that was not specified before they signed up for the course. I had reserved a lab for this pilot session just in case……(what did I not trust???) This turned out to be a stroke of genius or just good fortune as four students did not have the necessary technology requirements and had to meet in the lab at school. I also was at the lab and Christine sometimes was there and sometimes at home.

The first meeting took place face-to-face in the lab. There was so much information to hold and relate that it took one and a half hours to review and explain the technological aspects/requirements of the course alone. Students went on overload and had that glazed over look indicating that overload has just occurred. The students as a group were not as technologically savvy as I imagined them to be. Those who were technologically aware and comfortable helped out the others time and again.

By the end of the first class session, I felt as if I had pulled an all-nighter – it was exhausting. There was so much to relate and so much anxiety present on the part of the both the students and myself. The course met once a week for 21/2 hours.
Christine was not at all sure that this was going to fly!
Should I have listened to her?!

The course was created in a weekly format with each class session/week having its own web page. Students could only access the current week or the weeks already presented. Future weeks were only released for viewing the day of the class. Students would log onto CuSeeMe first, and then open Blackboard for course content once I prompted them to do so. Christine was present for most classes as technology consultant and to keep people who were not in the class out of the room as the room was created in public domain.

The Benefits of a Virtual Classroom

In order to experience interpersonal communication, we all had to be there.
All students had to do was to get themselves to their computers, push a few button and voila, they were set to go – no mess, no fuss, no bother, no travel delays.

Virtual classroom is a viable way to "reach out and touch everybody". It provides an opportunity to reach out to different student populations and to have a different relationship with students. This technology allows students to receive an education without leaving home.

It also allowed me to experiment with a new medium as I was absorbed with the idea of how we as educators can deliver our services to students in a different way that will allow us to serve a broader community of learners.

Surprisingly, distance also creates intimacy and honesty. I found that I had a closer and more candid relationship with students than I have in the classroom and this was curious to me. I think the face-to-face situation makes people distance themselves but online they are already distanced so they can be more personal. It was a very curious twist and one that I did not expect or anticipate.
Students became creative learners**.** This course pushed student to embrace something new and helped them traverse territories they wouldn't necessarily traverse both with the content and the medium of delivery. In so doing students' own sense of exploration, risk taking and thinking outside the box was stimulated and expanded. Students were pioneers – they hung in and did not give up even though at times it was very frustrating in not being able to connect.
I know that this course stretched students to show up in a different way than they usually do – there is no place to hide online in this venue. They had to participate and contribute or else

someone in the class would call them on it. This does not usually happen in the face-to-face classroom. Thus the students had to be more accountable both to themselves and each other.
Students learned about themselves and their reactions to stress and distress based on the technological situations. Thus the limitations of the course due to technology became the springboard for them to learn about themselves in this area.
Community was created. Students relied on each other to learn how to troubleshoot technology problems and also for course content. They were more willing to be self-revealing and honest with each other, even more so than they are in the face-to-face classroom. They also had the opportunity to think about themselves and how they are in the world and in so doing felt they learned a great deal about themselves.

The Limitations of a Virtual Classroom
The touch factor is not present online, of course. There is something invaluable to being in close proximity physically that may enhance learning and knowing.

One difficulty with the online course was that is was a challenge to "read" the room and to respond to non-verbal behaviors which is one of our hallmarks as humans.
Technology is not as quick as human muscles and so the immediacy of feeling students' reactions and noticing confusion or success or dissatisfaction was not available. So reacting and being present in the moment to the myriad cues that we get face-to-face was not available.

Managing classroom environment brought into play a different set of cues such as listening more to tone of voice, reticence of students to contribute and overall body language rather than the subtleties and nuances that one picks up face-to-face.
I needed to ask more often what was going on and how people were feeling or thinking than in a regular classroom environment. I had to rely more on verbal cues and the attitude of students to engage. Sentences were needed more than one word responses to which I couldn't respond quickly because of technology delays.

Online it was much more difficult to roll with the glitches than face-to-face as adjustments involved so much more over space. So little things felt much bigger and at times overwhelming. It was much harder to make changes on the spot online than in the regular classroom situation in which one responds to a myriad of cues and clues both consciously and unconsciously.

Course goals and content were compromised. I did not present all that I usually do in this course. I didn't have the opportunity to explore and sink into the material in as great a depth as I can do in the classroom. It took more time to process and explore than in the face-to-face classroom. The spontaneity of the classroom was missing.

Technology Migraines

If anything can go wrong, it does!

There were initially four students in the lab at the college and sometimes this grew to six or half the class, as technology at home computers broke down. Since not enough CUSeeMe programs were installed on college lab PCs, students had to pair up and so not everyone was visible at all

times. Therefore, some interpreting of students' input and ideas resulted from this sharing situation. This interfered with the flow of the class.

The lab itself was on a T1 line and sometimes connectivity speed was compromised if many users were on line at the same time. However, students had no trouble with connectivity speed/connections at home. Technology problems for students off campus consisted of failed microphones or audio, connection speed, missing plug-ins and an assortment of other issues. We were hand-tied when students needed technology help at home because there was no one to help them there or on campus. The best we could do was to talk students through downloading plug-ins while class was going on or advising them to wait and then watch the vignettes/listen to music later. They therefore missed some of the class discussion when these things were presented and they couldn't participate.

we first used CUSeeMe it did not have private rooms, therefore, we were fair game for whomever wanted to enter. The platform had a "zap" function we could use if people not associated with the course entered the room. Christine also served as the official "zapper" for interlopers in the course and there were many in each class session as not all the slots on the screen were filled due to students not being able to log on or students sharing computers/programs.

CUSeeMe tech support was non-existent when we first began and it was difficult to obtain help when needed. This situation has now changed and CUWorld has a support team and places to go for help such as message boards and FAQs arena.

Technology became an obstacle and detractor and took attention away from the content of the course. This certainly is the downside of teaching a course online for the first time. More experimentation and use of the platform is needed before one can decide how successfully this can be used as an educational forum.

Students' Feedback

Interpersonally, students communicated more out of class than they normally do in a face-to-face class. Due to the technology, they turned to each other for support and help and had the opportunity to get to know one another outside of the scheduled sessions.
Students learned about their own frustration levels, how to use others for help, their own limitations and that it was acceptable to not know how to do something. Students also felt that their interpersonal skills outside of the classroom improved vastly as they had to take initiative in class to obtain help and give and receive feedback. This skill was transferred outside of the classroom into their daily lives as well.

Students learned much more about technology than they ever bargained for, especially how to tweak their equipment and to troubleshoot technology problems. They were resourceful in finding ways to communicate and regularly used Instant Messenger (IM) with each other as well as online chat functions, telephone, and face-to-face meetings.

One effect that could be activated from the old version of CUSeeME was that of the "lights are on, nobody's home." Students learned how to face freeze, an option not available with the cur-

rent version of CUWorld. With this option, students could freeze their faces and then go about other business at home, such as doing laundry, eating and other things that they did not choose to share with me at our final lunch celebration. With this confession, I felt students had really learned to use technology to their advantage! However, they claimed that they did not abuse this function.

There was a greater level of comfort online than in the face-to-face environment. Students were at home which meant that they were in a familiar environment and more at ease and casual. They were easier with themselves due to this familiarity. Camaraderie level amongst the students was high.
They were also more honest about each other and what each was able to present and perform. They gained greater insight to each other's personalities and personality quirkiness and shared this with each other. There were less secrets about each other and hence a more real and pragmatic attitude than what happens in the face-to-face classroom.

They also felt closer to me due to having a shared experience fraught with glitches and successes. I felt I got to know them better as well.

Technology impeded progress on one hand and helped develop community on the other. Shared struggles builds community. Students just took the glitches in stride and worked around it. They were resilient and supportive of the process and medium of delivery.

To Teach or not to Teach an Online Course Teaching online can be extremely exciting, creative, and educationally sound if you dedicate a great deal of time and effort to make the course interactive and enlivening. You have to think differently about what you want to convey and how you want to convey it.

You have to be willing to take chances with course content in order to teach in a way you've never taught before. It is a real "thinking outside the box" experience.
I had a vision for this course, but technology hasn't caught up with it yet.
I found that I was not too welcoming to students when they showed up at the lab due to technology failures at home and had to get over my own disappointment that it was not smooth sailing.

You need to rid yourself of pre-conceived ideas of how things are ***supposed*** to run and be willing to go with the flow, quite literally.

Stress is a built-in condition with online education due to technology, newness, who is going to show up, - in other words, all in the area of "performance anxiety," or, to put it in the vernacular, "will I/it be okay today?" which both facilitators and students ask themselves. From this course, it seems as if students handle it much more easily than the professor and facilitator. Could it be that ignorance is bliss and since the students are not privy to all that goes into the course, they are immune from most of the stress causing agents? Therefore support is key**.** Good support at some level is mandatory at your institution, from your colleagues, mental health counselor, friends and/or nature - whatever works for you. Online education is not a solo activity. This is a community event and you need help on board for your physical, mental, emotional and even spiritual well-being.

If you choose to teach online and this is not the norm at your institution, you need to advertise your course appropriately to encourage student enrollment. It is so new that students and others have no idea what it is about. So get out the word at your institutions in whatever way you can. It is a hard sell as it is so new and skepticism seems to show its face quite rapidly. It is at this point you need to breathe and be willing to access the pioneer that is in you.

And in the end…

It all works out in the end and we live happily ever after…..
Or does it work out? Does online education deliver the goods?
Is the Internet the answer to our educational woes that is going to help with budgets by bringing in hoards of students into our classes?
We know asynchronous online courses fly, then are virtual classes feasible?
To what degree will it be useful and "catch on"?
Are there resources to support the development and implementation of creative virtual classrooms at our institutions?
The jury is still out and we need to do much more experimentation to find out if this will be the next or new wave of educational innovation that will change or alter the face of educational delivery.

Hybrid Classes: Maximizing Institutional Resources and Student Learning

Thomas Gould
Arts, Sciences, and University Transfer
Durham Technical Community College
1637 Lawson Street
Durham, NC 27703
Phone: 919.686.3443
E-Mail: gouldt@gwmail.dtcc.cc.nc.us

"Hybrid instruction is the single greatest unrecognized trend in higher education today."— Graham Spanier, President of Penn State University

Introduction

Recently, the North Carolina Community College System office released a memorandum to all the Chief Academic Officers and Distance Learning Coordinators of the state's community colleges announcing the System's new emphasis on Hybrid course instruction. This official statement of direction recognizes and validates the steadily increasing trend, both within the state and across the country, of integrating/adding hybrid, or blended, instructional delivery into traditional and Internet course offerings. The integration of Hybrid course instruction will benefit both the institution and the students. Institutions will be able to maximize their available physical resources, and students will be able to maximize their learning potential.

Hybrid classes are commonly defined as courses "in which a significant portion of the learning activities have been moved online," a combination of traditional classroom and Internet instruction (Garnham and Kaleta). Instructional time traditionally spent in the classroom is reduced and replaced with online learning activities. The ultimate goal of hybrid instruction is to combine the most effective instructional aspects of the traditional classroom with the most effective instructional aspects of the virtual classroom "to promote active independent learning and reduce class seat time" (Garnham and Kaleta). Using available computer-centered technologies, instructors use the hybrid model to redesign some course content into new online learning activities, such as discussion forums, case studies, tutorials, self-testing exercises, simulations, and online group collaborations.

Maximizing Physical Resources

At the present time, record student enrollment growth and budgetary constraints are challenging institutions to effectively serve their students. With enrollment projected to continue to increase and with little hope for an improved economic climate, many institutions are facing a crisis situation. Classroom space, especially computer lab access, is at a premium. Simply put, institutions have insufficient physical resources to meet the needs of their expanding student bodies, and with the current state budget projections significant help from state government will not be forthcoming. Institutions must, therefore, look within for remedies. While not a panacea, hybrid courses will allow institutions to maximize their available resources to meet the educational and institutional needs of their students. On a resource level, hybrid instruction reduces overcrowded classrooms. Specifically, two classes can operate in one physical space. For instance, if two

classes traditionally meet two days a week, say Monday and Wednesday from 9:00-11:00, converting these classes to hybrids will allow each one to occupy the traditional classroom one day a week, one on Monday and one on Wednesday, and to hold the other class period on the Internet. This ability to operate multiple classes in one physical space is especially important when computer labs are involved. Even more than traditional classroom space, available computer lab space is in short supply. The technology-heavy environments of the academic and professional worlds demand computer literacy from our students. Hybrid instruction offers students the opportunity to gain that essential experience, both in the computer-equipped classroom and in the completion of Internet assignments and activities. Additionally, hybrids allow institutions to offer more classes at peak demand times of the day, thus maximizing the scant available resources by increasing flexibility in scheduling. According to Ron Bleed, Vice Chancellor of Information Technologies at Maricopa Community College, hybrid course offerings "may also be the only way colleges and universities can keep up with the continuing population growth and the demands for lifelong learning" (qtd. Young). On a pure cost level, hybrids reduce paper and photocopying costs. In hybrid courses, all course documents, including syllabi, lecture notes, assignment sheets, and other hard copy handouts, are easily accessible to students on the course web site. Institutional costs decrease as students become familiar with the vast resources available on the web; institutions will be able to effectively communicate with their students electronically, thus reducing the needed number of printed schedules, bulletins, advertisements, and so on.

Furthermore, faculty compensation and professional development funds have been among the early casualties in the budget wars. Unfortunately, developing online course material is time consuming. While "faculty workload and compensation policies that take into account the effort required by distance courses can encourage faculty participation and improve the quality of instruction," the lack of such compensation discourages an already overworked faculty from participation ("Compensating" 7). Hybrid course development can serve as a way for interested faculty to ease into distance learning formats without the burden of developing an entire course online. At Guilford Technical Community College, faculty began "with a web-supplemented site [syllabi, grades, announcements] and then add[ed] materials to develop a hybrid class…" (Cerniglia 2). This "graduated approach to course development" produced an addition benefit: "Over two semesters, materials were added, tested, and refined, resulting in higher-quality materials than might have been developed in one semester without student feedback" (3). In this way, the institution maximizes the expertise of its faculty without incurring professional development costs. Even in the midst of a budget crisis, colleges still embrace the same mission: To educate its students. In fact, state budget problems only mirror a dire larger economic picture, illustrated by rising unemployment figures. When workers find themselves out of a job and with bleak prospects for employment, they turn to the colleges for reeducation and retraining. So, the colleges face a double impact on their resources: Record enrollment growth colliding with budget cuts. The integration of hybrid instruction into the college's offerings will not solve the problem. However, hybrid instruction will allow institutions to maximize their available resources to meet their students' educational needs.

Maximizing Student Learning

In addition to institutional benefits, hybrid instructional delivery of classes will enhance student learning in a variety of ways. Online instruction, like traditional classroom instruction, has

strengths and weaknesses. However, combining the strengths of both models can lead to a highly effective delivery of instructional materials. The old fear in distance learning of pale students huddled over their computers, learning in isolation and deprived of human contact has been proven groundless. Today's students are comfortable with electronic communication and view their online activities as integral to their learning experience. The benefits to the students of hybrid instruction are manifold.

First, student participation in all aspects of the learning experience is increased in a hybrid format. Faculty who have used the hybrid model report an increased interaction of students with their fellow classmates and with the course instructor ("Hybrid"). Some students are reluctant to participate in traditional classroom discussions or direct questions to the instructor. The hybrid environment offers a less-intimidating forum for student participation. In a hybrid format, "some students who rarely take part in classroom discussions are more likely to participate online, where they get time to think before they type and aren't put on the spot" (Young). On Discussion Boards, students can freely interact with their classmates, posting paragraphs and responses and asking questions. Often, these online discussions achieve the back and forth conversational quality desired in traditional classroom discussions. Students are able to offer their classmates information, encouragement, and support. In particular, introverted students and English as second language students participate fully in the learning activities. The inclusiveness of all students leads to a richer and more diverse learning experience than the traditional classroom model. Interaction with the instructor is also increased, thus enhancing learning. Students are more likely to e-mail a question than to raise a hand in class. Research indicates that students "are more motivated [to succeed] if they are in frequent contact with the instructor" ("Guide #9"). An additional benefit of this form of communication is that the student can ask a detailed question and the instructor can respond with an appropriately detailed answer, free from the situational constraints that limit one on one communication in a traditional classroom. In a hybrid format, students are highly engaged in the course progress, both with their classmates and with their instructor. Students so engaged are less likely to withdraw from the course and more likely to seek help if difficulties arrive, either from classmates or instructor.

Another benefit is flexibility. With jobs (sometimes multiple), families, and other classes, today's students often have crushing constraints on their available time. Commuting time to campus only increases the burden. Hybrid classes will alleviate a portion of the time wasted commuting. Scheduling of classes also becomes less of a nightmare. Classes with lab components can take up an enormous amount of time, leaving less available space for additional classes. Hybrids will give students more options to develop manageable schedules.

Another benefit for students is the development of and emphasis on so-called "soft skills," necessary for successful completion of any course with a substantial online component. These skills are highly desired by today's employers. To succeed in hybrid classes, students will necessarily develop or enhance time management skills crucial to academic and professional success. Hybrids require students to meet specific deadlines for posting work to the Discussion Forums or submitting work to the instructor. Critical thinking skills and problem-solving skills are also emphasized. The text-based format of the courses enhances comprehension skills. Additionally, hybrids increase computer skills, another highly valued trait in the modern workforce, regardless of the profession. Hybrids train students in a variety of computer skills, including file management, e-mail use, and web site navigation, that will prove valuable in the workplace.

Hybrid courses, in effect, are writing-intensive courses. According to Peter Sands, "[b]ecause of the highly text-based nature of websites and e-mail, hybrid courses become de-facto writing-intensive courses when teachers work carefully to integrate the online and classroom components." Discussion Forum postings and responses and e-mail communication with classmates and the instructor all provide students with ample opportunities to hone their written communication skills. The format of the course also reinforces to students the importance of writing skills, regardless of the course. This understanding will then continue in the work place. One constant complaint of today's employers, regardless of the field, is the inability of their workers to construct effective written communication, particularly problematic in our text-driven work environment. Hybrids require students to produce coherent and effective writing. This skill inevitably leads to increased opportunities for academic and professional success. Furthermore, in contrast to traditional classroom writing activities, hybrids can realistically reflect the "real-world" writing conditions, including collaboration. Successful hybrids incorporate collaborative activities. Rachel Spilka, at the University of Wisconsin-Milwaukee, realized that in traditional classroom assignments she "wasn't able to simulate writing situations in workplace settings, or to expose students to the complexities of workplace writing." Using a hybrid format, she developed assignments where students have "produced much more thoughtful, tactful, and sensitive memos, letters, and reports than have students in [her] traditional, face-to-face classes." In collaborative activities with their hybrid classmates, her students "improved their skills and displayed such qualities as good judgment, tactfulness, empathy, patience under difficult circumstances, and the ability to negotiate. All of these qualities they will have to demonstrate when they work and write in workplace settings" (Spilka). Students in hybrids quickly discover that they are not learning in isolation; instead, they are members of a learning community, dependent on and responsible for their classmates. This learning environment more closely resembles the work place than the traditional classroom.

Hybrid classes address a variety of learning styles by offering instructional materials in a wide range of formats. As a result, every student in the course is fully engaged in at least some class activities (Young). For instance, auditory learners benefit from traditional classroom instruction as well as online audio files. Visual learners benefit from a consistent and structured layout as well as graphics. Tactile learners benefit from "hands-on" computer use and navigation. With an appropriate organization of assignments, "teachers can have students engaged in doing, rather than just experiencing or reading" (Sands). These examples are just a sampling of benefits to diverse learners. Additionally, students have greater access to course materials and therefore are more fully engaged in a hybrid than a traditional course. They can view and review prerecorded lectures and access course notes and other materials such as course syllabus, assignment schedule, task sheets, grades, and so on. This easy accessibility of course resources serves to promote a positive learning environment for all learners.

The combination of online and traditional classroom instruction fosters a more objective-focused and more time-efficient course than the traditional classroom-only model. At the University of Wisconsin-Milwaukee, "instructors reported that the hybrid course model allows them to accomplish course-learning objectives more successfully than traditional courses do" ("Hybrid"). Hybrid course development requires careful scheduling of assignments, and the creation of effective distance learning components demands a "focused preparation" of course material ("Guide #2"). Therefore, instructors come to reevaluate how their course materials and instructional strategies achieve course competencies and objectives. Students then more clearly see the connections be-

tween the assignments and the objectives, making the course more purposeful for them. Furthermore, hybrids encourage integration of out-of-class activities with in-class activities to allow for more effective use of traditional class time. Students use the online component to generate material for in-class time, thus avoiding wasting valuable class time spent on learning activities students could very well do in front of their home computers.

The Research

To date, two institutions, University of Central Florida and University of Wisconsin-Milwaukee, have conducted comprehensive examinations of hybrid course effectiveness. Faculty participants in hybrid course instruction at the University of Wisconsin-Milwaukee "almost universally report their students learned more in the Hybrid format than they did in the traditional class sections" ("Hybrid"). In fact, instructors stated that hybrid-enrolled "students wrote better papers, performed better on exams, produced higher quality projects, and were capable of more meaningful discussions on course material" (Garnham and Kaleta). Data from the University of Central Florida indicates, "students in hybrid courses achieve better grades than students in traditional face-to-face courses or totally online courses" (Garnham and Kaleta). Furthermore, hybrid courses have lower withdrawal rates than do fully online courses, and student retention in hybrids is "equivalent" to that of traditional courses (Garnham and Kaleta).

Certainly, Hybrid course integration will not solve the complex budgetary and enrollment growth issues facing state governments and colleges and universities. However, hybrids do offer an alternative, innovative, and effective strategy for providing needed educational opportunities and avoiding cutting services. Furthermore, hybrids should not be viewed as a stopgap method for meeting student demand and offsetting budgetary constraints. Instead, hybrids should be embraced as an instructional delivery system that benefits both the educational institution and the student population it serves.

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Building A Wireless Campus & Community

Robert E. Griffin
Michael E. Shanafelt
George F. Pyo
Kent P. Tonkin
Center of Excellence for Remote and Medically Under-Served Areas (CERMUSA)
Saint Francis University
PO Box 600
Loretto, PA 15940
ghaid@cermusa.francis.edu
(814) 472-2708

Why Do You Want A Wireless Network?

So you think you are ready to consider building a wireless computer network? You read about wireless networks in the newspaper and computer magazines, and those publications say that *wireless computing is the wave of the future*. To help you decide if wireless is right for you, you purchased an off-the-shelf wireless computer network; a wireless network in a box. It consisted of an access point (you've learned that the jargon computer term for an access point is an *AP*), some wireless network cards, and worst of all, a sheet of instructions (instructions are the sheet of paper with the writing all over it). You've loaded a wireless PC card into your laptop computer (the sales person told you that the card you bought from him is the best in the world and is adaptable to any of the changes to ever be contemplated in the wireless standards), perhaps you even read the instructions, and now you think you are ready to go!

Perhaps your situation is a bit different. You have been asked to present an academic paper on a college campus, and have learned the campus uses a wireless network (the campus brochure says it's a *WLAN* and you have learned that means a *Wireless Local Area Network)*. You stop by your local computer store and purchase a Wireless LAN (WLAN) card for your laptop computer so you can make use of the network when you are on the campus. What do you need to do now to make this work?

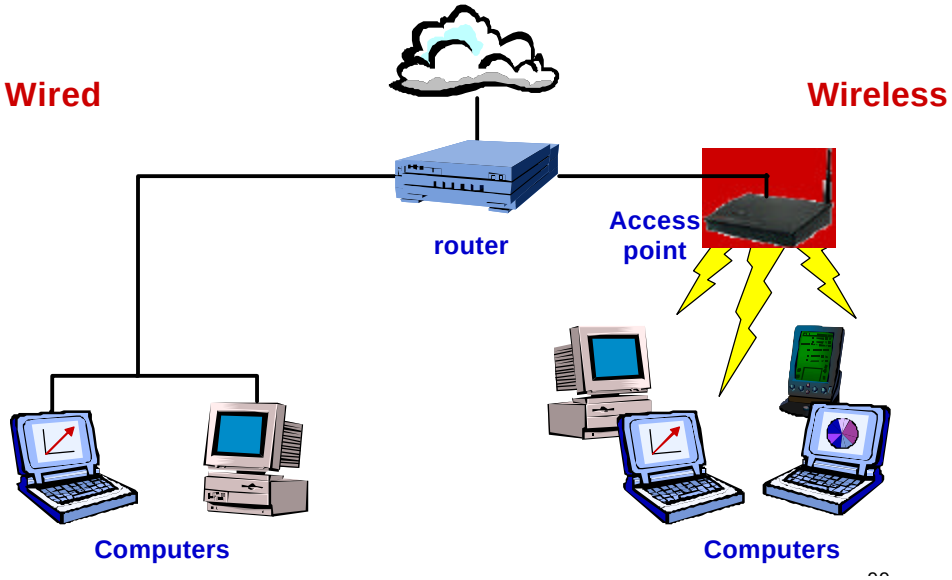
Or consider another possibility. You have heard from your information technology colleagues that a wireless LAN is in the planning stages for your campus. It seems everyone is moving to a wireless LAN. But you have watched the computer business for a long time and you have learned before that in the technology business, it is wise to wait a year before you purchase equipment. History has proven to you that prices will come down if you wait. Do you proceed, or do you wait?

As academics, we are witnessing a new way of approaching computing in today's academic institutions. Is it wise for you, in your situation, to proceed with a wireless computer networking decision, or should you wait for a more opportune time? *What do you do?* This is the question we will try to answer.

What Is A Wired Network?

Let's take a moment to understand wired and wireless computer networks. Just a few years ago, new building construction included wiring conduit that allowed builders to run computer cable (copper or fiber) to classrooms, laboratories, and students' desks. Rooms were wired with at least one, and often many computer network connections. Over the years many college campuses invested heavily in stringing cable to connect dormitories, classrooms, and other campus buildings. Wired networks on campuses are now successfully carrying students' e-mail, faculty handouts, administrative forms, and a vast array of Internet traffic. Note the network shown in Figure 1.

Figure 1
A Combination Wired and Wireless Network



In Figure 1 the center of this network is the router, which connects beyond to the Internet (designated by the cloud). Hard wiring is noted with solid black lines.
Notice that each piece of hardware on the wired network side of the diagram (left side) is connected with wire, hence the name wired network. A wired network is a very efficient and fast method of computer networking.

Who would want to replace a wired network that is working efficiently? The argument that is often posed is that a school administrator has devoted a lot of time and financial effort to constructing this wired network. The answer is no one needs to dismantle the wired network. The axiom of "if it works, don't fix it" holds true here.
However, wireless networks may be the answer to future network expansion and possible new innovations in education. Wireless networks have become a viable alternative to wired networks. Wireless networks can operate in conjunction with wired networks and give high-speed access with extreme flexibility.

Let's now see how a wireless network compares to a wired network. Look at Figure 1 again and this time focus on the wireless network portion of the diagram (right side). The heart of the wireless network is again the router. However, note in the wireless network, the wire from the router connects to an access point. The access point is really an antenna (sometimes referred to a radio) that sends and receives computer data to wireless hardware that is located in various computer peripherals. In Figure 1 you see a variety of computing devices including desktop computers, laptop computers, and handheld devices. The lightning bolts in the diagram signify the wireless connection. Notice that it is only the final link of this wireless network that is truly wireless. Technologists often refer to this wireless connection as the *last mile*.

Wired Classroom Example

Now that you have a basic understanding of wired and wireless networking, let's see how a real classroom operates in both a wired and wireless environment. Figure 2 shows a modern technology classroom originally designed as a wired computer classroom.

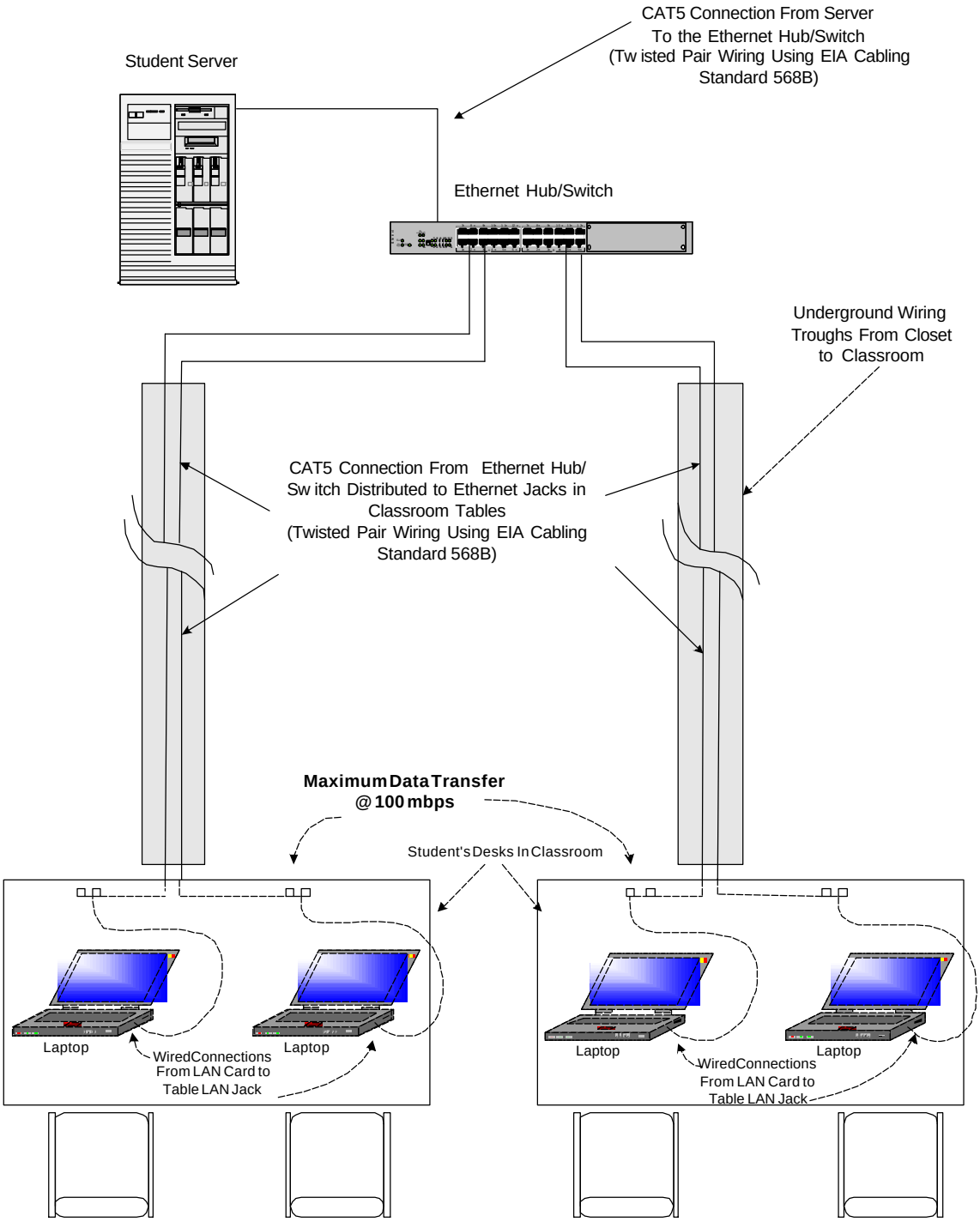
Figure 2
Technology Classroom

Photo courtesy of Saint Francis University

The classroom shown in Figure 2 was designed to seat approximately 50 students. The original wired design allowed each student to sit in his or her workspace and have access to a laptop computer during the class. Laptop computers were chosen for this classroom because the room was not intended to be a permanent computer laboratory. The plan was to have computers moved in and out of the room as lesson plans dictated. In the original wired design, each laptop computer had to have computer and power connections available. Through the computer connection, each computer was wired into the campus network. Note in the inset photo, the connection point shown in the highlighted box on each of the student's desks. Each connection point houses a computer connection point (if you want to sound like you know what you are talking about, that computer connection point is called a RJ-45 connector) and a standard grounded elec-

trical plug. Figure 3 shows a schematic diagram of the above technology classroom in the wired configuration.

Figure 3
Wired Technology Classroom



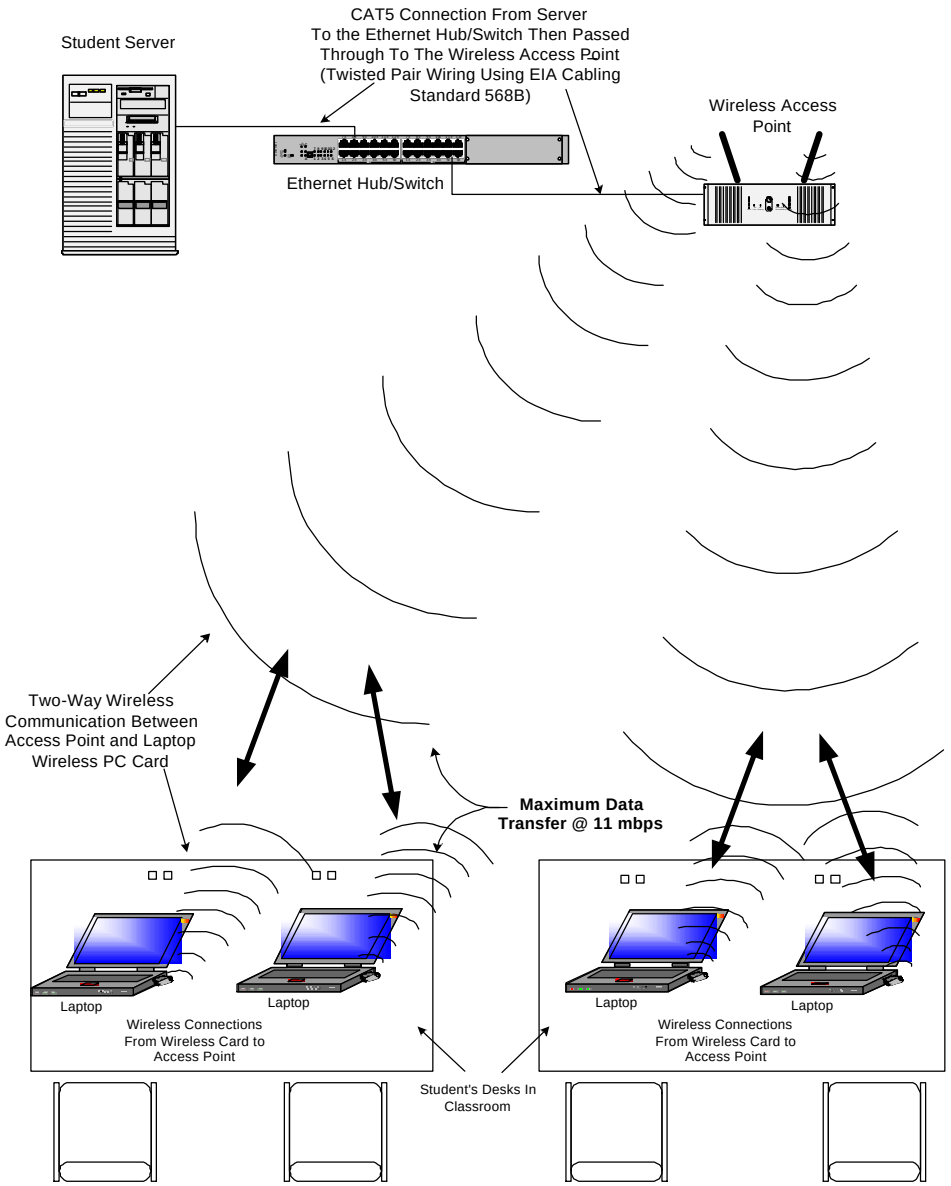
Note in Figure 3 that each computer is connected to the server and hub via a hard-wired connection. This wire must be snaked through ceilings and floors and eventually be connected to

the desktop connection. Fifty wires (for fifty computers in the classroom) must be directed from the hub location to the students' desks. Running that many wires can be an architectural feat.

Wireless Classroom Example

Now that you have a basic understanding of a wired classroom, let's take the same classroom, remove the wires, and replace those wires with a wireless network. Our same classroom, this time dressed for the wireless environment, is shown in Figure 4.

Figure 4
Wireless Technology Classroom



Notice, in the wireless classroom, it is not necessary to connect each wireless classroom computer to a connection point on the desktop. Computer connections in this example are all wireless. Wireless connections (if you want to get technical, these wireless connections are waves of radiation much like a radio station uses to broadcast its programming) are made from each computer back to the centrally located access point (remember, the *AP*) and then via a wired connection back to the remainder of the network. In short, a WLAN simply replaces the last hop in the network (access point to computer) with a wireless connection. Hence wireless networks, as used in this book, are really a combination of wired and wireless architecture.

Advantages Of A Wireless Network

Now that you understand what a WLAN is, you should understand that there are advantages and disadvantages to a wireless network. Let's look at these advantages and disadvantages quickly.

It is important to remind the reader one more time that a wireless network will not replace a wired campus network; it will only replace some of the wired connections. Most of the wired connections that you have already invested in on your campus will remain intact. Wireless connections usually only replace the final connection to the student's computer. Since this paper is intended to be a quick read, let's show the advantages and disadvantages in tabular form.

The advantages of wireless coverage are well known. Figure 5 lists advantages from the users' perspective.

Figure 5
Advantages of Wireless Computer Networking

#	Advantage	Notes
1	A wireless network, used with laptop computers, allows totally portable computing.	Battery life of a laptop computer is the only limitation to totally remote computing. Average single battery life today is from 1 to 3 hours. Developing electrical connections are important.
2	In existing building structures, wireless computing can save remodeling costs.	One access point usually can accommodate ± 30 students.
3	Wireless networks are simple to maintain and require little effort beyond what can be expected from a wired network.	Most people will find that building wireless networks are out-of-the-box solutions.
4	Using power over CAT-5 technology significantly reduces the cost of wiring each access point.	
5	A wireless computer network will permit the true classroom without walls and will allow the technology to be brought to the students rather than have the students be taken to the technology.	

6	It is no longer necessary to build dedicated computer laboratories.	Every classroom can be a computer laboratory when you use wireless laptop computers.
7	Manufacturers of wireless computer networks are groping for market share and no true leading vendor has yet emerged; therefore, you have more than 1 or 2 vendors currently producing wireless equipment. For this reason you are seeing rapid and massive innovation in wireless networking equipment.	

Disadvantages Of A Wireless Computer Network

There are also some disadvantages with going with a wireless computer network. Most of the disadvantages would not be classified as deal breakers; however, they should be considered before you move ahead with a wireless computer network. The disadvantages are shown in Fig. 6.

Figure 6
Disadvantages of Wireless Computer Networking

#	Disadvantage	Notes
1	Wireless computing can leave vacant spots (areas which there is no signal) of coverage. A user can be connected one moment and move to a vacant area and become disconnected.	While this disadvantage is reality, the user can move into a connected area and be reconnected usually without rebooting the computer. Large dead spots can also be converted to accessible spots by installing additional access points.
2	Most wireless access points only accommodate ± 30 users.	Multiple access points may be required to accommodate more than 30 people. This solution requires more complex networking.
3	Often wired electrical connections within classrooms must continue to be maintained to accommodate computer power needs.	Single battery life continues to be in the 1 to 3 hour range. Batteries need to be recharged after that time and require power outlets.
4	Wireless networking provides a slower transmission rate than wired networking.	Wired networks typically transfer data at 100 mbps. WLAN's transfer information at 11 mbps while newer technology transfers at 53 mbps.
5	Data security issues still remain with wireless networks. Digital signals passed through wireless networks can be intercepted.	

6	Physical security concerns of laptop computers are increased because connection wires are removed from computers.	

Summary

You have seen from the discussion that wireless networking is really a misnomer; a wireless network is really a combination of wired and wireless technology that provides portability to a computer network. We have seen the basic architecture of both wired and wireless network computer networks and reviewed the advantages and disadvantages of a WLAN.

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Let the World Know Who You Are!
Creating Your Home Page Using Microsoft FrontPage 2002

Debra Hanna
Professor of Business
Business Division Chair
West Shore Community College
3000 N. Stiles Road
Scottville, Michigan 49454
(231)845-6211 ext. 3529
dmhanna@westshore.edu

The Internet is an ever-growing electronic universe. Students are expecting to be able to find any information they need with the click of a mouse button. Thus, it is becoming more important than ever that we make ourselves known and available on the World Wide Web. This session is designed to give you the basics to create a web page using Microsoft FrontPage 2002. If you have a syllabus, documents, or pictures which you would like to work with, bring them along. You will be able to take home your web page project on a 3.5 floppy at the completion of the session.

Session Objectives:

1. Describe FrontPage and explain its key functions
2. Identify the basic elements of a web page
3. Create a home page
   - add and modify text
   - add and modify hyperlinks
   - add and modify graphics
   - add and modify tables
   - modify backgrounds
   - modify page title
4. Add additional pages to the web sight
5. Publish and save the pages to a disk

Describe FrontPage and explain its key functions

FrontPage 2002 is a simple but powerful tool for designing great-looking web sites. It has the web page creation capabilities which are designed to be used by both the beginner and experienced web site developers.

The FrontPage window consists of a variety of features to help you quickly create professional looking web page.

- title bar – displays the application name
- status bar – consists of a message area and a download indicator
- menu bar – each name represents a menu of commands
- standard toolbar – contains buttons that contain commonly used commands

- formatting toolbar – contains buttons to execute commonly used formatting commands
- views bar – contains icons that allow you to switch to different views
  - Page – used for creating, editing, and previewing a page
  - Folders – displays a view of the web files and folders (similar to Window Explorer)
  - Reports – displays a list of reports that can be used to analyze the web's contents
  - Navigation – used to display the web's structure (will be used to create automatic-link navigation bars)
  - Hyperlinks – displays a list showing the status of the hyperlinks in the web
  - Tasks – displays a list of tasks

Identify the basic elements of a web page

- Window elements
  - Title – text that appears in the title bar of the browser and on the button in the task bar
  - Background
    - Color
    - Image
  - Text elements
    - Header – where the title and other information about the page is contained
    - Body – the text that makes up the main content of the web page
    - Normal text – the default font style and color
    - Lists – can be either numbered or bulleted
  - Hyperlink elements
    - Text hyperlink
    - Image link
    - Hot spots
    - Bookmarks
  - Image elements
    - Inline image
    - Clipart
    - Digital file image - .jpg or .gif
  - Other elements
    - Forms – used for feedback
    - Frames – divides the screen to display multiple web pages
    - Tables – must be used to insure proper alignment of text and images

Create a home page

- Add and modify text
  - Key in desired information
  - Select the text
    - Format – font ---- or
    - Right click – Font ---- or
    - Use the appropriate buttons on the formatting toolbar
- Add and modify hyperlinks

    - select the text or graphic
        - Insert – Hyperlink ---- or
        - Right click – Hyperlink properties ---- or
        - Click the Hyperlink button on the Standard toolbar
            - Pick the page to link to ---- or
            - Key in the web page address
    - Add an e-mail link
        - Key in the text or select the graphic
        - Follow steps to create a hyperlink
        - Choose 'E-mail Address' option an the left of the dialog box
        - Key the desired e-mail address
        - The link will place the text "mailto:" in front of the address
    - Can also link to a bookmark on the same page or on another page
- Add and modify graphics
    - Insert – Picture
        - Clip Art ---- or
        - From File
    - Select the graphic
        - Use the 'handles' to resize
        - Right click on the graphic
            - Picture Properties
            - Make desired changes
- Add and modify tables
    - Table – Insert – Table ---- or
    - Click the Table button on the Standard toolbar
        - Drag the mouse over the number of cells you would like in the table
    - Point to the cell borders and drag to the desired width
    - Right click in the table
        - Choose Table Properties
        - Make the desired changes
        - Setting the border to 0 will make the cell borders invisible on the web page
- Modify backgrounds
    - Format – Backgrounds
        - Make the desired selections
        - If you choose a picture it will tile if it is not large enough
        - Picture selections override the color option
- Modify page title
    - This will appear in the title bar of your browser
    - This will appear on the button on the task bar
    - When saving
        - Choose – Change Title in the dialog box
        - Key the desired title
    - Right click on the page
        - Page Properties
        - Key in the desired title

Add additional pages to the web site

- File – New – Page
- File – Import
- Insert – File

Publish and save the pages to a disk

- File – Save
- File – Publish
  - Server must have FrontPage Extensions installed
  - Will publish all pages that have been changed
  - Will also publish all graphics contained on the pages
- If the server does not have the FrontPage extensions installed, you can FTP the files and graphics
- If you are using Blackboard or another course management software package that requires HTML format, you can copy the HTML from FrontPage and paste it into the course management software.

Quick Tips: What You Always Wanted to Know About Office But Were Afraid to Ask

Debra M. Hanna
Professor of Business
Business Division Chair
West Shore Community College
3000 N. Stiles Road
Scottville, Michigan 49454
(231)845-6211 ext. 3529
dmhanna@westshore.edu

Task	Instructions	Applications
Quickly Navigate Through Applications	To quickly move from application to application, hold down the Alt key and repeatedly press Tab key. When the desired application is selected, release the Alt key	
Create 'Fake' Text	Type the following: =rand(n,m) The **n** indicates the number of paragraphs The **m** indicates the number of sentences in each paragraph	Word, PowerPoint
Zoom In and Out	Hold down the Ctrl key and move the mouse wheel up or down	Word, PowerPoint, Excel
Change the font size	To increase/decrease the font size in increments of one point: hold the Ctrl key and press] to increase or [to decrease the font, or hold the Ctrl key and press shift and > to increase or shift and < to decrease the font.	Word, PowerPoint
Repeat the Last Edit	Press the F4 key	Word, Excel
Using the Format Painter (Paintbrush)	Place curser within the text which has the desired format. Click the paintbrush on the tool bar and then select the additional text to be formatted If you double-click on the	Word, PowerPoint, Excel, FrontPage

	paintbrush you can select additional text multiple times (press the esc key to turn off the paintbrush)	
Remove All Formatting	Select the text then press Ctrl + spacebar	Word, PowerPoint, Publisher, FrontPage
Position Graphics	Select the graphic and format the wrapping style to something other than 'In line text'. With the graphic selected, nudge it using the arrow keys. (You may have to hold the Ctrl key down to nudge in smaller increments or Alt + left mouse button.)	Word, PowerPoint, Excel
Extend Selected Text	After selecting text, press the F8 key to allow you to extend the selection. When you perform an action such as bolding the selection mode is turned off. To manually turn off the mode press Esc. Or Hold the Shift key down to increase/decrease the selection.	Word, PowerPoint, Excel, Publisher, Outlook, FrontPage
Select Noncontiguous Text	Select the first desired text Hold the Ctl key down Select the next desired text	Word
Change the Case of Text	Select the text and press the Shift and F3 keys.	Word, PowerPoint
Spacing Between Sentences	Open the Tools menu then choose: Options – Spelling and Grammar – Settings	Word

Horizontal Line Dividers	Key in the following symbols and press Enter: --- 3 hyphens ___ 3 underscores === 3 equal signs ### 3 pound signs *** 3 asterisks ~~~ 3 tildes	Word
Using Auto Correct for Text	Open the Tools menu then choose: AutoCorrect Options Key in letter code to replace Key in the desired new text Click – Add - OK OR Key in desired text Select the text Tools AutoCorrect Options Key in letter code to replace Click – Add - OK	Word, PowerPoint, Excel, Publisher, Outlook
Using Auto Correct for Symbols	Open the Insert menu then choose – Symbol AutoCorrect Key in letter code to replace Click Add – OK	Word, Outlook
Using Shortcut Keys for Symbols	Open the Insert menu and then choose – Symbol Select symbol Shortcut Key Press key combination Assign - Close	Word, Outlook

Using Shortcut Keys for Autotext	Step 1 – Create the autotext – Type in text – Highlight the text – Click Insert – Auto-text – Choose New – Type the name for the entry Step 2 – Customize the keyboard – Click Tools – Customize – Click the keyboard button – Select Autotext from the categories box – Type in the hot-key combination you wish to use -- Click - Close	Word
Save or Close All Documents	Hold the Shift down then select File then Close All	Word, Excel, FrontPage
Create a Chart	Select the data for the chart Press the F11 key (To modify the chart, point to the object to change then click your right mouse button and format…)	Excel
Create Random Numbers in Excel	Key =rand() This will generate a number between 0 and 1 Key =rand()*(b-a)+a This will generate a number between a and b If you do not want the numbers to change Generate the numbers on a second worksheet Select the numbers Right-click – and copy On original sheet – right-click where numbers are to be positioned Choose paste special – values - OK	Excel

Take a Break	To toggle a blank screen on or off, press b or period. To toggle a white screen on or off, press w or comma.	PowerPoint
Quickly go to Any Slide	Type the slide number and press enter. To go to the first slide, hold down both mouse buttons for two seconds.	PowerPoint
Hide or Show the Pointer and Pen	To hide the pointer, press Ctrl + H To show the pointer press Ctrl + A To show the pen press Ctrl + P	PowerPoint
Select Dates	Select the first date in the date navigator then hold the Ctrl key down and continue to click the additional dates. Up to 14 dates can be selected	Outlook
Change Timeline	While in the Calendar view, right-click on the times and choose the desired interval	Outlook
Delete Messages Without Sending Them to the Deleted Folder	Select items to be deleted then hold the Shift key down while deleting the items. Answer Yes in the dialog box.	Outlook
Schedule an E-mail Response	Drag the message from your Inbox to the Calendar icon or folder. Fill in the needed information when the new appointment dialog box appears.	Outlook
Quickly Send an E-mail to a Contact	Choose the Contacts folder, then drag the contact onto the Inbox icon or folder. A new mail message will appear.	Outlook

Quickly Set and Delete Tab Settings	Set tabs: Cycle through the tab indicators at the left of the ruler until the desired tab appears Click on the ruler in the desired location Delete tabs: Drag tab off the ruler	Outlook
Quickly Change Tab Settings	Select text that contains the tab settings Drag the tabs along the ruler to the desired location OR Select text that contains the tab settings Double-click on one of the tab settings Make the desired changes in the dialog box (be sure to click on set between each change)	Word
Add a Screen Shot	Tap the Print Scrn key then paste into a document (To modify the size, click on the 'crop' button on the pictures toolbar and remove the unwanted portion of the picture and then re-size the picture.)	Word, PowerPoint, Excel, Publisher, Outlook, FrontPage

Knowledge Creation in Higher Education Institutions: A Conceptual Model

Sam Hijazi
Lori Kelly
Florida Keys Community College-William Seeker Campus
5901 College Road
Key West, Florida 33040
(305) 296-9081x341—email: Hijazi_s@firn.edu

Abstract

Higher education institutions and the business world have some difficulty understanding the implication of knowledge management as a new model to support business processes. Knowledge management calls for an organization to share and disseminate its intellectual capital - knowledge. The main challenge lies in not being able to fully answer the question: "What is knowledge?" This paper attempts to define knowledge by introducing a new model that views the various parameters involved in knowledge creation collectively. The model emphasizes the importance of information systems as a major input factor in creating knowledge. Human creativity, innovation, experience and other intangible factors are included. The difference between explicit and tacit knowledge is discussed. Educational institutions and businesses alike can enhance their understanding of knowledge management.

Introduction And Problem Statement

Academics, experts and technology vendors agree that it is a fruitless attempt to find a ready made comprehensive definition of knowledge management, KM (Mann, 2002). Mann continues by stating that for an organization to succeed with knowledge management, it needs its own explanation and terms. With this simple but yet complex conclusion, every manager is required to participate in the process of defining knowledge. For managers to understand and foresee the importance of applying knowledge management, they need initially to realize the meaning of knowledge itself and the factors that play important roles in creating it. In the article "Definition of Knowledge: A Business Perspective," the author states:

> The word 'Knowledge' brings with it a set of semantic problems since it has many meanings depending upon the speaker and listener's interpretation of the context within which it is spoken and heard. Unlike other words whose different meanings can be inferred from their sentence context, 'Knowledge' is easily misunderstood despite the context.

By answering the questions below, we might be able to understand what is involved in knowledge creation and we might find a clear definition of knowledge. These questions include:

1. In the process of creating knowledge, what are the factors that contribute to its creation?
2. What are the relationships that exist between data, information, and knowledge?
3. Which factors are tangible and which are intangible?

4. After creating knowledge can knowledge workers or managers classify the end result as the same type, or do we have different types of knowledge?

Problem Background

This section is divided into two parts. The first part discusses the problem of information overflow and the difficulties associated with controlling such phenomena. The second part shows the limited number of applications of knowledge management and knowledge creation in academia or the business world.

For some years now, the complaint has been not the lack of information, but having so much of it. We are constantly looking to extract meaning from the massive amount of information. Rutherford D. Rogers states, "We are drowning in information and starving for knowledge." Skyrme (2002) notes that we need to consider the amount of information we gather every year. He notes that in the year 2000, the world has accumulated up to 22 exabytes ($22 * 10^{18}$) bytes. The author continues to state that every year, we add up to 4 exabytes. With a simple calculation, we can see that it will take us less than six years to double the amount of information in existence today. In a final note, Skyrme invites us to examine the fact that if we have a problem finding knowledge today, then with much more information to probe, we should anticipate a bigger problem in the future.

Managing such amounts of information becomes a tedious task. According to Abram (1997) "we are entering an era where competencies related to managing overabundance (information oceans) are key." Abram maintains his argument by noting that the activities of "filtering, selection, organizing, digesting, packaging," must be applied to simply deal with the massive informational overflow.

Obviously there is a need for sorting through much information to extract more meaning. Sjoerd Vogt in the article "Turning Data into Information into Knowledge," states that a survey was conducted by Ernst & Young. The number of subjects surveyed was 431 executives; 300 of them were from the US, and 131 were from the UK. There were 20 questions on how knowledge had been used. One important question was "What are the most strategically important issues?" The results showed that 87% of the executives believed that knowledge was very important in dealing with competition. Also 97% of the executives sought more "knowledge on customers." Eighty percent (80%)of the executives felt that they need more knowledge founded in "best practices/effective processes." Finally, 86% of the executives felt a need to understand "their own competencies and capabilities." Vogt continues to state that 44% of the executives felt that they were inadequate or very inadequate in disseminating knowledge to different parts of their business. Finally, only 12% believed they were "above average at leveraging" the existing knowledge.

Review of Literature

In the process of constructing a model that contributes to an environment rich in knowledge, it is necessary to define knowledge and knowledge management. There is a definition of the position of chief knowledge officer. The relation between information technology (IT) and KM as well as definition of the types of the knowledge is discussed. Since most of the applications of KM are found in the business world, this paper questions whether a consideration has been given to KM in higher education. Finally, some of the benefits and difficulties in applying KM are discussed.

Definition of Knowledge and Knowledge Management

There is a need to clarify the difference between the way epistemology looks at knowledge and the way knowledge management views knowledge or better yet knowledge creation. In response to a question posted by Yogesh (June 18, 1997) in www.brint.com by the title "Knowledge or Information? A 'Musical' Analogy," the author referred to Nonaka & Takeuchi who stated that there is a distinction between viewing knowledge from an epistemological standpoint and a knowledge management perspective. Epistemology focuses on the fixed, exact and nonhuman makeup of knowledge. On the other hand, in knowledge management, knowledge is dynamic, workable and lively. Finally the author concludes that, with that in mind, we focus on "knowledge creation" instead of on the idea of knowledge itself.

In the electronic dictionary "Free On-line Dictionary of Computing", FOLDOC, the author states, "knowledge differs from data or information in that new knowledge may be created from existing knowledge using logical inference. If information is data plus meaning then knowledge is information plus processing."

From the "Knowledge Management Forum, KM Forum Archives -- The Early Days," the author discusses Denham's research on knowledge and knowledge management. Denham defines knowledge as "full utilization of information and data, coupled with the potential of people's skills, competencies, ideas, intuitions, commitments and motivations." From the article "Definition of Knowledge: A Business Perspective," the author states that knowledge helps us to determine "who should act, what should be done, when it should happen, where work should be conducted, why it is important, and how to do it so that we can optimize our effectiveness." Further the article mentions that knowledge directs us as to how we should process data and information to achieve decisive end results.

A New Executive Position: Chief Knowledge Officer, CKO

As Chief Information Officer has been a title particular to an executive who leads an information systems department, a new title is given to those executives who lead knowledge management projects in an institution or an organization. Davenport (1996) discusses that a CKO's responsibilities should include "creating a knowledge management infrastructure, building a knowledge culture and making it all pay off economically." Davenport adds that to build a knowledge management infrastructure, information technology plays an important role.

Knowledge Management and Information Systems

There is no doubt that knowledge management is notably linked to information technology. To support this notion, McDowall (October 4, 2002) notes that knowledge management has been adopted partially to deal with changes within an organization as a result of using information technology. In discussion about how knowledge management as a business practice has impacted the way information specialists are handling information technology, Srinivas (2003) in his article "Types of Knowledge Management" states:

A knowledge architecture determines how everyone will communicate, how databases will be designed, how information will be structured and named, and how legacy information systems

will be integrated. This ensures that key business information is identified, categorized, and ranked according to its value. Increasingly, information resource specialists who used to spend their time searching for and forwarding documents and information are being asked to help categorize and catalog resources for access in a knowledge management system.

The website SearchCio.com which is powered by whatis.com relates knowledge clearly to information technology. The author states, "in information technology, knowledge is, to an enterprise or an individual, the possession of information or the ability to quickly locate it." In this respect, the author sees a definite link between information systems as a container that allows users to retrieve their needed information and the information itself.

There is clear evidence that information technology as an infrastructure is essential to support the implementation of various technological innovations to support knowledge creation. In an active survey in the website "www.metakm.com," 492 respondents (as of March 8, 2003) answered the question, "Which technology would like to implement for knowledge management systems?" The following results are listed:

1. Internet/intranet/Extranet	31.71%
2. Document Management	11.38%
3. Search/Index/Retrieval	6.10%
4. Data warehousing/Data Mining	6.71%
5. Groupware/Collaborative tools	14.63%
6. Enterprise Information Portal	20.33%
7. Business Intelligence	7.11%
8. Other	2.03%

Types of Knowledge

Tiwana (2000) states that there are two major categories of knowledge management. These are explicit knowledge and tacit knowledge.

> **Explicit knowledge**. By referring to Nonaka and Takuchi, Choo (2003) states explicit knowledge can be "expressed in words and numbers, and easily communicated and shared in the form of hard data, scientific formulae, codified procedures, or universal principles."
>
> **Tacit knowledge.** Tiwana (2000) states that knowledge that materializes in people's minds throughout their careers and their experiences which is not as easily recorded is called tacit knowledge.

Knowledge Management and Higher Education

Cronin (2000) referred to Cronin and Davenport who states that universities are ideal places for knowledge creation. Further, there is convincing evidence that theories and practices of knowledge management applied in the business world can as easily be applied to higher education.

Mann (2002) referred to a "joint venture between industry and the university sector." This collaboration will identify problems associated with knowledge as behavioral and organizational

instead of being a technological problem. Further, some of the problems that can be dealt with are:

1. Align information technology with social networks and dealings
2. Encourage and support the use of knowledge management
3. Allow knowledge transfer across different tasks
4. Apply knowledge to workers' management
5. Practice tacit (hidden in people minds) knowledge within your surroundings

Mann concludes that industry will profit from the research done by the university sector. Also the industry can benefit from "individual knowledge audits" and through communications with other businesses practicing knowledge management. Higher institutions can apply knowledge management practices with potential success in a variety of activities, including research, instruction, and community service (Kidwell, Vander & Johnson, 2001). Kidwell et al. add that knowledge management should not be looked upon as a drastic change, rather the concern should be to focus on smart implementation of knowledge management.

Benefits of Applying Knowledge Management

Srinivas (2003) by referring to an article researched by "Information Management & Economics, Inc.," states that by applying effective knowledge management, an organization can:

1. Connect people of different backgrounds. This will result in enhancing the work environment as a whole
2. Disseminate tacit knowledge more easily
3. Locate and identify any gap in knowledge and attempt to fill it
4. Implement new technological tools that assist in the sharing of knowledge

Srinivas continues by listing the benefits of applying the above points. These include:

1. Enhanced decision making
2. Preservation of corporate memory
3. "Increased innovation"
4. Ease and aid in the translation of information into knowledge.

Mann (2002) from the article "people.html" states that in implementing knowledge management, businesses can deal with issues that, up to now, have been ignored. The author lists "trust and privacy," eliminating obstacles to sharing, "ownership," applying incentives by encouraging, rewarding and identifying employees who share knowledge, and finally alliance with the business mission.

Difficulties in Managing Knowledge

Knowledge management is not an easy job. It requires planning and having a vision. Prusak (2001) discusses indirectly the idea of knowledge creation by stating that "strategy academics" and others see a firm as an organized assembly of competencies "somewhat bound by its own history." Also he adds that institution effectiveness is restricted by its present social and cognitive expertise. Even though there are "knowledge engineering methods and tools" that assist in finding knowledge assets in an organization, these tools don't provide help in managing the processes of managing knowledge (Macintosh, 2003). Macintosh continues by stating that regardless of the difficulties associated with finding "an efficient and cost-effective manner" to manage knowledge assets, an enterprise can:

1. Establish a common understanding as to what knowledge management is through the whole organization.
2. Recognize, "model and explicitly represent their knowledge."
3. Emphasize the sharing and the reuse of knowledge through different divisions and users.

Devlin (1999) discusses the difficulty associated with knowledge hoarding, since
there might an incentive for such an act. The author adds that people tend to do that as a way of protecting their jobs.

Purpose of the Study

The purpose of the study is to create a model that aids in understanding knowledge creation, by discussing all input factors such as perception, experience, judgment, innovation, data, and information to create knowledge. The administrator or manager will be able to question, examine and review all the steps in acquiring knowledge. By discussing and clarifying the difference between explicit knowledge and tacit knowledge, managers will be clear about not only the difference in the two types of knowledge, but they may understand when and why each type is applied to maximize their return.

The Model

The Theoretical Approach

The theoretical approach for the model is derived from the diagrammatic model (see Figure One) which depicts the three main elements in knowledge creation. These include data, information and knowledge and all the elements that affect each component in knowledge creation.

Data. Data are raw facts without meaning until they are processed into information.

In a business environment that depends on information technology, knowledge creation usually starts with data. Davenport (1998) states that there should be collaboration between data managers and knowledge managers who should rely on the involved models. The author adds that these models "on how data can be structured in the future were seldom realized."

Wallace and Riley (2001) discuss that for the last two decades universities have been collecting various types of data. Digitized data include "student record, personnel information, and financial data." Additional data are emailing, Internet access types, "market statistics," "course evaluation," "library catalogues," and data found in personal digital assistants and websites. In the model, as a first step in knowledge creation, data is considered as the initial input and it must go through processing or the set of rules that will convert it into information.

> **Information.** As seen from the model, information is the end result of processed data. Once a set of rules built into a processor or a program is applied to a set of data, information is produced. In other words, information is processed data. Also, different processors can be applied to the same data to generate different type of information.

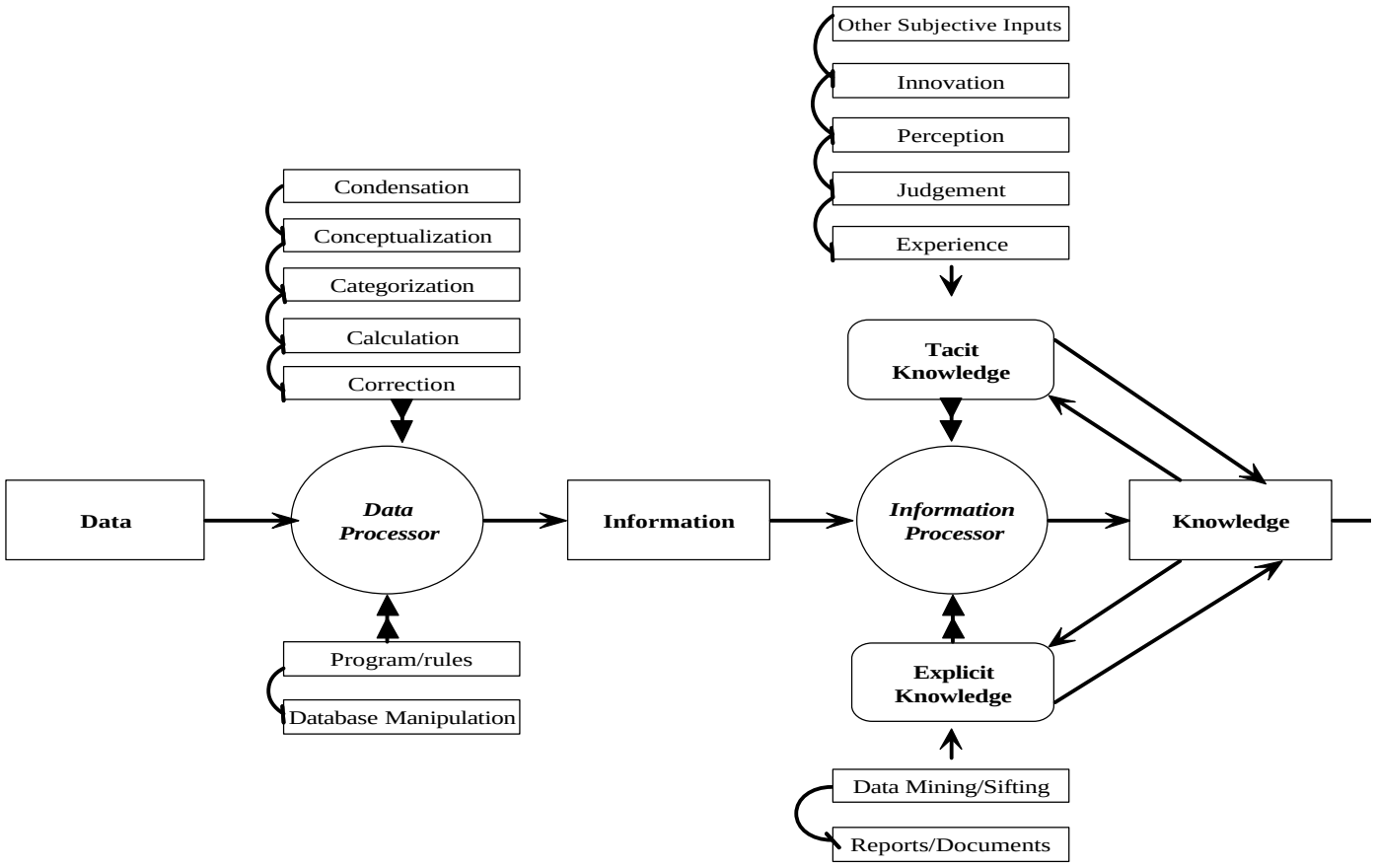
Wiegand and Waloszek stated "the structure of information is an important factor in understanding relationships among data." The model shows that data must go through a processor to be converted into information. What does the processor contain to convert data into information? The processor contains instructions or a set of rules that act on the raw facts to add a context.

In order to assist the reader to get a quick idea as to what it takes to add meaning to the data to achieve information, the model adopted Davenport and Prusak (2000) "five Cs.". The authors discuss that the person who creates information can add meaning to data. They concentrate on the following five processes to assist in making meaningful information:

1. "Contextualize" - the purpose of utilizing the data is known
2. "Categorize" - the part of data under analysis is determined
3. "Calculate" - using mathematical and statistical analysis
4. "Correct" - removing faulty data
5. "Condense" - summarize or view data in a tabular form.

The Diagrammatic Approach

Figure 1. Figure one depicts the links between all the factors that might produce knowledge. Also the figure shows how knowledge can be of two basic types, mainly tacit and explicit.



These methods add meaning to the raw facts found in data. The model also reminds us of the rules found in the application software or the database to convert data into meaningful information. A database software is conceptually no different from any program that contains those rules that will allow the manipulation of data. Database software stores, sorts, retrieves, queries (asks questions based on certain criteria), and generates reports. Administrators in higher education institutions are concerned with generated reports that help in making sound decisions.

Knowledge. After acquiring information from the previous step in the model, information goes through the information processor. The information process is influenced by two factors. These are tacit knowledge and explicit knowledge and the elements that influence each of them.

First we will discuss tacit knowledge. According to Skyrme (2002), 70 percent of any organizational "vital knowledge" comes directly from tacit knowledge. This is what employees carry in their heads. Skyrme continues by saying that with such high dependency on tacit knowledge, most organizations focus their attention on explicit knowledge and information retrieval only. However, there is a definite need to shift our attention to how we capture, record, and disseminate the important asset of tacit knowledge.

As mentioned earlier, tacit knowledge is found in people's heads; therefore it is considered an intangible component in the knowledge creation process. The model shows how profoundly tacit knowledge impacts the process of knowledge creation. It doesn't get its feedback only from the resultant knowledge, but is enriched by other non-quantitative inputs. Although there are many factors that influence tacit knowledge, primarily the model focuses only on four intangible factors including innovation, perception, judgment, experience. Some other subjective and qualitative inputs will be discussed briefly.

1. Innovation. Knowledge creating and innovation are linked. Nonaka and Takeuchi (1995) state that innovation is a result of continuously creating knowledge, circulating and implementing it. Further, in the process of employing knowledge to create an innovative environment, this knowledge must be linked to new products, technology, and existing systems.

2. Perception. From extracts of Peter Drucker's work "Management: Tasks, Responsibilities, Practices," the commentator notes that "the connection between experience, perception, and concept formation -- that is, cognition -- is, we now know, infinitely subtler and richer than any earlier philosopher imagined." Further, the author states that to communicate anything to another person, it would be impossible to do so unless the other person applies the faculties of perception.

3. Judgment. As seen from the model, judgment is qualitative input in knowledge creation. Tiwana (2000) notes that knowledge includes judgment as a factor linked to it. From the article "Manage the 'Other Half' of your Knowledge, Kamoon Inc.," provided by www.kmworld.com, the author refers to the Delphi group by stating that "Up to 42% of the knowledge that professionals need to do their jobs comes from other people's brains—in the form of advice, opinions, judgment or answers."

4. Experience. According to Garvin (2000), experience is created from multiple cycles of previous results deposited as information. When we examine this information, experience becomes a learning tool. Further, the author states that regardless of the style of learning, we always end up with better understanding, improved skills, and enhanced ability to function.

5. Other qualitative factors. This paper will not attempt to count all the many factors that contribute to knowledge creation in an institution. In reference to knowledge creation and intangible factors, Tiwana (2000) discusses the fact that decision makers always integrate their "values, assumption and beliefs" in the nature of the organization. Further, to distinguish between information and knowledge, the author states that acquiring knowledge is a different process than acquiring information, since "knowledge acquisition is the process of development and creation of insights, skills, and relationship." (p. 72)

Second we will discuss explicit knowledge. Explicit knowledge can be codified. It is found in reports, procedures, and best practices. This section will briefly discuss data mining and stored reports and documents since they form main inputs to explicit knowledge.

1. Data Mining. Sifting or data mining is the act of going through massive amounts of data to extract new knowledge. In defining "data mining", www.whatis.com (2003) shows that data mining is the process of data categorization to recognize "patterns" and creating "relationships." The definition discusses a list of parameters that impact data mining:

a) "Association" – attempt to find patterns based on events and their connection to other events
b) "Sequence or path analysis" – attempt to find a connection between a later event that was caused by an earlier one
c) "Classification" – attempt to look for new patterns
d) "Clustering" – attempt to find new and previously unknown facts and documenting them visually
e) "Forecasting" – attempt to make responsible future forecasting based on discovered patterns

2. Report and Documents. Administrators and/or managements can reexamine old reports and documents to find any information that can add value and understanding to a current problem. Archived reports and documents can contain invaluable input to the information processor to add more competence to the produced knowledge.

It should be noted from the above that neither tacit knowledge nor explicit knowledge is considered static by nature. Human experience shows that knowledge is not a static issue; rather it is dynamic and ever evolving. This notion is supported by Peter Drucker who states, "Knowledge changes incredibly fast and today's knowledge is tomorrow's ignorance," from an interview by Information Outlook (February 8, 2002). For that reason, the model emphasizes the need to examine the circular relationship between all the elements that create knowledge.

Finally, we must keep in mind that the resulting knowledge has no value unless an action follows. In other words, all knowledge creation must be followed by an action to make the whole process of knowledge creation valuable. Pfeffer and Sutton (2000) warned business leaders of

the millions of dollars spent every year on learning and training without any benefits. One main reason for this "knowing-doing gap" is not being able to turn knowledge into action.

The Importance of the Study

This study will contribute to the literature of knowledge creation in general. The most notable contribution of this study is the relationships between data, information and knowledge. This study assesses various parameters that lead to producing information. Also, the model relates several factors to provide the reader with an understanding of knowledge creation. The main benefit of the study is to see data, information and knowledge as interrelated concepts but with different contributions and purposes as inputs to knowledge creation.

Conclusion

This study attempts to answer the question, "What is knowledge?" and what factors add to the knowledge creation. The study includes a review of literature that covers topics including data, information, knowledge, knowledge management, and knowledge creation. A graphical model is designed to depict all the elements included in knowledge creation. The paper discusses in detail all depicted symbols found in the graphical model, creating a conceptual model of knowledge creation in higher education institutions or in any business application.

As a final thought, there is a need to emphasize that higher education and businesses alike are not using knowledge creation adequately. As seen from the review of literature, knowledge creation can enhance decision-making regardless of the business operation. Although knowledge management applications are not easily practiced, academia can greatly benefit from knowledge creation processes. There is no doubt that higher education institutions can increase their social and cognitive skills by applying knowledge management.

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Epublishing-What is Available?

Sam Hijazi
G. Gerald Cash
Florida Keys Community College-William Seeker Campus
5901 College Road
Key West, Florida 33040
(305) 296-9081x341—email: Hijazi_s@firn.edu

Abstract

E-publishing has become an alternative and inexpensive method to compete with traditional publication. Educators have access to a myriad of applications software and web authoring tools to produce lively publications. This paper starts by covering HTML as the basis for creating a website. There is a discussion of DHTML and JavaScript and the ease of adopting pre-existing codes to suit the writer's needs. Other commercial software such as Adobe Acrobat Writer-Reader, PowerPoint and FrontPage will be discussed also. This research will examine the maturity and availability of e-books software in the market. Finally the paper will cover the implications of E-publishing regarding how we access and view information.

Introduction

This paper examines the availability of E-publishing as an alternative to traditional publication. The paper starts by discussing Hypertext Markup Language (HTML) as the main building block for the majority of existing websites. Considering the limitation of HTML in designing dynamic and interactive websites, Dynamic HTML (DHTML) is discussed. DHTML can provide the designer with additional tools such as the ability to view elements in a website as objects, to control page layout by using Cascading Style Sheets (CSS), to utilize programming tools to add interactivity, and to create dynamic independent fonts. Also, this paper discusses the option of using existing code to save time and effort.

The paper shifts to discuss commercial software packages. It starts by discussing the difference between Dreamweaver and Frontpage as two common web-authoring softwares. PowerPoint as a commercial presentation and E-publishing software is also discussed. In discussing e-books, this paper examines e-book devices and software. It moves to examine briefly the industry's support of E-publishing. Finally, this paper attempts to collect different views of using E-publishing by comparing it to traditional print publishing.

Hypertext Markup Language- HTML

As the language behind most of the websites in the World Wide Web, HTML is and easy language to learn. Dekker and St. John (2000) state that millions of people can produce their own websites. The only skill needed is an elementary understanding of Hypertext Markup Language-HTML. The authors encourage users who want to publish colorful and interesting websites to learn HTML even though they use commercial web-authoring software. The writers add "HTML is a living, growing language; understanding how it works is critical to keeping up with its latest innovations."

To create a website by using HTML, no special software is needed. From the website of The National Center for Supercomputing Applications (NCSA), the author answers the question, "A Beginner's Guide to HTML?" by stating that HTML is a file that contains "plain-text" also identified as ASCII (American Standard Code for Information Interchange). The author adds that a user only needs a simple text editor, such as Notepad, to create HTML documents.

To become proficient in using HTML, you need to be familiar with most of the tags that form the key words or syntax for HTML. In discussing tags and how they are used in HTML documents, the author in the NCSA website states that elements are the main building block of a document. Tags are used with elements. "HTML tags consist of a left angle bracket (<), a tag name, and a right angle bracket (>). Tags are usually paired (e.g., <H1> and </H1>) to start and end the tag instruction. The end tag looks just like the start tag except a slash (/) precedes the text within the brackets. " Further, some elements contain attributes that add extra information about a specific tag. For example, a publisher may use attributes such "top, bottom, or middle" to position an image within an HTML document.

If publishers are satisfied using HTML to produce static publishing, there are hundreds of valuable websites that provide decent tutorials and assistance in learning HTML and web development. "Static" is the lack of interactivity. A person can only view a page, read it, and notice the use of different fonts, colors and even organized information in a tabular form.

Learning HTML is worth the time invested in the process. Educators and students should take advantage of the existing websites on the WWW to learn HTML. As of March 24, 2003, there are 209 tutorials found in Google.com's directory and there are 95 guides and tutorials in Yahoo.com's directory. As a final note, it should be noted that most of the commercial application software, especially word processors (including Microsoft Word, WordPerfect, and other leading software) provide the user with the ability to save documents as HTML. The resulting HTML documents (WebPages) are ready to be submitted to an Internet server to be posted for viewing. However, knowing HTML allows the users to modify (in case they are not satisfied with the results) the HTML code generated by these software packages.

Dynamic Hypertext Markup Language- DHTML

For those publishers who want to publish their written materials on the web, but are limited by the static nature of HTML, Dynamic Hypertext Markup Language's technologies can provide them with dynamic construction tools. By searching whatis.com- searchWebSerivce.com, the site shows a comprehensive and detailed definition for DHTML. The site divided the definition into two main sections: definition of DHTML and the features and applications that are considered the building blocks of DHTML.

In defining DHTML, the author states DHTML combines HTML with new options and tags to be more responsive to the user's needs. DHTML will enable the user to view animated and interactive web site. DHTML allows the user to view a website as desktop and multimedia applications. Further, the author provides two example of DHTML These are:

1. A user can change the color of a text by passing the mouse on top of it.
2. A user can "drag and drop" an image from one location to another.

In discussing the features found in DHTML, the author mentions that both Internet Explorer (Microsoft web browser) and Netscape browsers support the following technologies:

Viewing Elements as Objects

Within each page, any header, paragraph, list or any other element is looked at as an object. To illustrate how the concept of object-oriented technology is applied to elements in a website, the author gives an example of using headers as objects. Since a header is looked at as an object, it possesses dynamic characteristics. Every header can be named with a unique name. These headers have properties of color and style of text. By focusing on these properties, a small script or program can address a header by its name and the selected events associated with it. For example, the event of passing a mouse over a header might change its color.

Cascading Style Sheets, CSS

The author of the article continues to discuss CSS by stating that it "describes the default style characteristics (including the page layout and font type style and size for text elements such as headings and body text) of a document or a portion of a document." DHTML allows the use of multiple cascading style sheets within the same or across multiple related documents.

Programming

The website, whatis.com-Dynamic HTML, notes that DHTML uses programming heavily since most elements (objects) found in a page can be manipulated by programming. There are three major programming or scripting languages. These include JavaScript, Java applet and ActiveX. To understand the impact of these programming tools, additional search beyond what was found in whatis.com-Dynamic HTML is needed.

> **JavaScript.** In the article "Introduction to JavaScript," the author distinguishes between Java as a full-fledged language designed by Sun Microsystems and JavaScript as scripting language that was designed by Netscape to add dynamic capabilities to websites. The author lists some of the features that pertain to lively Epublishing. These include "pop-up boxes," "mouse rollerover effects," menus, changing text found in the status bar, and drop-downs with linking capabilities. It should be noticed that with the availability of many websites that maintain JavaScript code, it is rarely necessary to write your own script from scratch.
>
> **Java Applets**. From the University of Washington, by responding to the question, " What is the difference between a Java Applet and a JavaScript?" the author states that Java Applet is a complete program that is customized and includes more powerful features than those provided by JavaScript. Similar to JavaScript, the author encourages the user to look for free and pre-written Java Applets.
>
> **ActiveX.** In defining ActiveX, searchWin2000.com, which is supported by whatis.com states that ActiveX is "roughly equivalent" to a Java Applet. The advantage of using ActiveX is the ability of using it in multiple Windows or Macintosh applications. An Epublisher can design or contract a developer to create an ActiveX program as part of

their work. The resulting object can enhance the understanding of a concept greatly. The different between Java Applet and ActiveX is that Java Applets can run on all major browsers, where you must have Windows or Macintosh machines to run an ActiveX.

Dynamic Fonts

In the article "Dynamic HTML," the author mentions that Netscape's Communicator suite contains dynamic fonts where a web designer can include files that include specific font style, size and color. These fonts will be downloaded with the viewed page independent of the browser.

Obviously not every Epublisher needs all the features provided by DHTML, especially if there is a learning curve associated with some of these technologies. It is good idea to keep in mind what is available because sooner or later you may need to publish some materials that require more than one perceptual faculty of the reader. At that time, DHTML will come in handy.

Using Existing Code to Create Dynamic Publishing

Noticeably JavaScript, by the number of the websites that support it, is still the most widely used scripting language to create dynamic websites. Fortunately for most Epublishers, there is a great amount of preexisting code written in JavaScript. Fiedler and Clark (1999) state that "there are probably enough free programs at places like javascriptsource.com and scriptsearch.com to let you go on for years without writing a line of code, but it's not that hard to learn, either." The authors encourage the readers to start learning JavaScript by visiting two websites: http://www.webdeveloper.com/javascript and http://wdvl.com/Authoring/JavaScript.

Giving credit to the programmer or the developing website when using preexisting code is an understandable obligation. Fiedler and Clark warned about the "difference between stealing someone else's scripts and using a pre-made script (and giving the proper credits in a comment tag in the script)." The authors state that professionals do not attempt to claim someone else's code as their own.

Commercial Software Packages

This section will discuss three major commercial software applications that are commonly used to produce Epublishing materials. These include FrontPage, Dreamweaver and PowerPoint. To make it an interesting discussion, this paper compares Dreamweaver and FrontPage.

Dreamweaver vs. FrontPage

Jorge (2, 2002) compares Macromedia Dreamweaver 4.0 and Microsoft FrontPage 2000.
The following points were extracted in relation to FrontPage and Dreamweaver.

FrontPage is one of the most popular web-authoring software applications in the market.
FrontPage

1. Is good for building uncomplicated websites.
2. Is integrated with other Microsoft products such as Microsoft Office. FrontPage is similar in its functionality to MS Word; therefore it is easier to learn for most people.

3. Can organize files and folders as a "tree-structure" in a website.

4. Comes with tools for uploading files to a website without the need for File Transfer Protocol (FTP) software.

Jorge states that Dreamweaver is very popular web-authoring tool because it is

1. A stable and extraordinary software for meeting advanced users needs.

2. Capable of changing between tables and layers. Dreamweaver allows users to develop their web sites with layers and transform the results into tables without losing structure.

3. Capable of creating image maps with a large number of links without the need for JavaScript.

4. Integrated with other Macromedia products including Flash and Fireworks (see the definitions of Flash and Fireworks in the Definition of Terms section).

PowerPoint

The main function of PowerPoint is to create slides presentation. Fay-Wolfe, from the University of Rhode Island, states "PowerPoint offers word processing, outlining, drawing, graphing, and presentation management tools- all designed to be easy to use and learn." From the Microsoft website, the author of the article "PowerPoint 2002 Product Guide" states that PowerPoint has been used by many people to communicate their ideas. From the online help that comes with MS Office, the writer states that PowerPoint has the ability to edit and format documents in more than 80 languages.

Similar to all MS Office Packages, PowerPoint can easily save your presentation as an HTML document to be viewed on the WWW. In addition to all the benefits of PowerPoint as an E-publishing tool, users can further enhance their publication with multimedia features such as 3-dimentional features, sound, animation, video, graphic and text.

eBooks

This section will discuss the maturity and availability of e-Book in the market. Also it discusses the benefits of using eBooks vs. pBooks (paper books). Since there are varieties of ways of using the term eBooks (Ebook, E-Book, e-Book, etc), this paper will be using the term eBook for consistency.

Definitions of eBooks

From e-Books.org, the page by the title "frequently asked questions," one of the questions was, "What is an e-book?" The author states that the term eBook is short for "electronic book." The author mentions that the term eBook might refer to an electronic device or the software used to read an eBook. From the website "Writer's Write," Van Buren and Cogswell (2002) discuss eBooks devices and eBooks software as follows:

eBooks devices. Van Buren and Cogswell state that eBooks devices are small electronic devices. Some of these devices are no bigger than a sheet in a notebook and don't exceed one inch thick. Further, these devices mostly use LCD screens, color or black-white screen, and usually come without keyboard. The authors point out three brands that are available in the market. These include Softbook Reader, Rocket eBook and Franklin eBook

1. Gemaster. The first two books were purchased by Gemstar, found in http://www.eBook-Gemstar.com/. By going to the Gemstar website, there is no mention of Softbook or Rocket eBook, instead there are new models: GEB 1150 and GEB2150. By giving a call to the technical support (1-800-386-7389), the help-desk person states that GEB 1150 is the newer model of Softbook Reader, where GEB 2150 is the newer model of Rocket book. They both have similar features with minor differences mainly in the battery capability. These styles of eBooks include the following features (as of March 25, 2003):
    a) A battery that lasts up to 20 hours for GEB 1150 and 10 hours for GEB 2150
    b) Larger memory where you can store dozens of reading materials
    c) Built-in modem. You don't need any computer or need to pay for delivery charges. In addition to the modem, GEB 2150 has a built-in Ethernet card.
    d) Adjustable brightness and contrast for reading even in the dark
    e) USB connection
    f) Change of font size for easy reading
    g) Search capability, bookmarks, and making notes
    h) Pre-installed dictionary- Webster's Pocket American Dictionary
    i) Comes with many accessories

2. Franklin Electronic. Franklin Electronic calls their device eBookman. In their web site, there are three models with the following numbers: EMB 900, EMB 901, and EMB 911. All the models can display 16 grayscale colors, run their operating systems, are PC system compatible, support MP3 format, use stylus, and they come with multiple accessories. The interesting part of Franklin eBooks is that their devices are capable of reading books. There are over 12000 audio books that these devices can play back. Also a user can download thousands of free books from Franklin Electronic website.

eBooks software. In discussing eBook software, Van Buren and Cogswell state that various companies are developing software that runs on different sizes of computers ranging from palm-size to desktop computers. By researching many websites pertaining to eBooks software, this paper will focus only on the most common three formats. These include Adobe (PDF), Microsoft Reader, and Palm Reader.

1. Adobe Portable Document Format (PDF). From about.publishing.com, the author states that Adobe (PDF) has multiple features. These include "Full text search, variable font sizes, zoom options, external HTML linking, internal hyperlinks," and "bookmarking." Further, the advantages of PDF are found in its popularity, hardware independency, and its utilization of "WYSIWYG" for printing. As disadvantages for using PDF, the author states that this format is hard to read on the screen and has weak security measures.
2. Microsoft Reader . From about.publishing.com, the author discusses the features included in MS Reader by noting its advantages: "ClearTypeTM display technology improves on-

screen reading, external HTML linking, audiobook interface, adjustable font size, full text search, bookmark and highlighting capabilities." The author states that documents in this format are easily created. The size of these files is small and they look great. Discussing the disadvantages, the author states that only Windows-based machines can read the MS Reader format and "text is not printable under any conditions."

3. Palm Reader. From palmdigitalmedia.com, the author discusses Palm Reader software by noting that "Palm Reader is an intuitive and powerful program for viewing Palm Digital Media electronic books (eBooks)." The advantage of Palm Reader is its ability to read text in a similar fashion to reading pBooks, one page at a time. This enhances the reader's experience compared to other software where a user has to use scrolling features. As a disadvantage of Palm Reader, the writer, from palminfocenter.com, discusses Palm Reader Pro by noting that it lacks some features found in other eBook readers. Also, it is not free.

Benefits of Using e-Books

Harris (1999) states that eBook has become a buzzword among publishers and writers. This is due to the inexpensive production and ease of updating the materials found in such media. In the article "E-books and eguides-ebooks," the author states that "the main difference between eBooks and pBooks (paper boks) is the elimination of the costly printing, binding and distribution process. This results in faster publishing and lower prices for the eBooks."

There is a clear indication that people start to benefit by using eBooks as a source of reading materials. In the Electronic Text Center in the University of Virginia (2002), the author states "6.4 million free eBooks shipped from this site August 8th 2000 - May 20th 2002 [or 6.8 per minute every day for 21 months!]." The number of downloaded eBooks indicates the high appeal of eBooks to many people. From the website Reading for the Future, an article with the title "Introduction to eBooks" discusses the advantages of eBooks over traditional ones. The author includes the following points:

1. eBooks are available 24hours/7 days a week through accessing the web and directly downloading.
2. eBooks are never out of print.
3. eBooks require no postal expense since they are delivered electronically.
4. eBooks are very portable and can be read anywhere.
5. eBooks have searching capabilities by keyword or phrase.
6. eBooks utilize a built in dictionary.
7. eBooks allow the addition of bookmarks and notes to the reading materials.
8. eBooks save physical space.
9. eBooks are usually 20-30% cheaper than pBooks.
10. eBooks are available all over the world.

Industry Support for E-publishing

From the article "Ebooks in the Classroom," the author states that DigitOwl, a software company based in Florida, is one of the pioneer companies to explore "digital textbook market." Digital

Owl, through sponsoring Florida Digital Textbook Initiative, is attempting to replace conventional textbooks in Florida School with "e-textbooks". These eBooks will be available on laptop computers and eBook reading devices.

Other companies have taken a daring step in the direction of providing students with electronic version of their textbook. WiseUp, as a featured link in about.com, provides students with interactive digital textbooks. WiseUp works with leading publishing companies. The author emphasizes the advantage of their electronic textbooks by stating that "the original textbook is provided in full, page-by-page, graphic-by-graphic—while providing the student with a rich new interactive experience." The student "can take notes electronically," link to the Internet directly, "highlight key passages digitally", and use a search capability.

Views on E-publishing

To search how we view and access information, there is no better way than examining and contrasting the methods of producing reading materials. These are print technology and electronic textbooks and publications. This section attempts to collect some views on printed materials and eBooks. There are two contradicting views to which one is the preferred approach.

Print

It would be unfair to ignore the benefits from printed materials over the years. Rawlins (1998) discusses the great benefits of printing and how it has made information available over the last five hundreds years. Printing "led to pagination, indices, and bibliographies since they were now possible and they made searching easier." The rewards of using print as a medium to exchange knowledge have been cultivated in multiple forms. Rawlins notes that print has "democratized knowledge, increased accuracy, made fiction possible, made propaganda possible, created public libraries, and created the idea of authorship."

Some readers still feel that reading printed materials has unique advantages that cannot be found in electronic materials. From the article "Ebooks in the Classroom," the author states that in 1998, a study published in the Human Factors & Ergonomics Society Journal found that readers experienced "decline in speed and accuracy, and an increase in fatigue, when reading from a screen rather than paper." Further, the author adds that subjective evidence gives favor to print. To support his previous statement, the author notes that proofreaders prefer printed materials, and most eBooks readers tend to "print before reading."

Electronic Books

There is evidence that eBooks can result in the same outcome as pBook when students use them. From the article "Who's Reading Ebooks," 91 students took a survey at Ball State University to verify whether students studying from eBooks instead of pBooks resulted in higher grades. After reviewing grades from 543 quizzes, the study showed that there was no difference between the two methods of studying. The professor, Richard Bellaver, who conducted the study believed that eBooks are practical tools for academic use.

Some readers have adapted to eBooks and they prefer accessing reading materials electronically. From an interview with Glenn Sanders –founder and director of eBookWeb.org, Spiccianti (2002) asked the question in reference to reading an eBook, "How would you compare the experience to reading a traditional book?" In answering the question, Sanders notes that he enjoys reading electronic books. Also Sanders states that lighting, "holding the pages open" or remembering his place are not problems anymore. He adds that the best reason for reading electronically is the use of the "find" feature to locate information much more quickly. In addition, Sanders mentions his ability to download a lot of information from the Net to read them later in his "Rocket eBook" or Pocket Pc any place away from his computer screen.

In discussing electronic scholarly publishing, Treloar (1995) notes that print publication is associated with the following advantages:

1. In referring to Harnard, the author states that journals are slow to produce since it takes a longer time to print a new publication.
2. Print publication cannot be searched easily, resulting in a second market to handle indexing and abstracting.
3. Information in print is only available statically.
4. If hyperlinking ever exists in printing, it is awkward.
5. In referring to Odlyzko, the author states print materials are hard to store, circulate, and in addition to that, they are costly.

The author adds that for all these reasons, pioneering companies, with the availability of technology, start to produce their prints electronically. "Such electronic publishing is sometimes referred to as epublishing." In a final note, there is strong support for Epublishing. It is found in the many websites, both in industry and academia. Epublishing "is here to stay. It's up to the writers, themselves, to raise the standard of writing through conventional means- writing workshops, analysis and writing."(Zaidman, 1997)

Definition Of Terms

FTP

FTP stands for File Transfer Protocol. It is a subset of the Internet that allows uploading and downloading files.

Flash

From www.macromedia.com, the author defined Flash as " the solution for developing highly visual interactive content and applications that deliver breakthrough experiences with significant return on investment." Also there are 497 million users who use Flash player on the Internet.

Fireworks

From www.macromedia.com, the author states that Fireworks is a creative and powerful tool. It includes "extensive format and standards support" to create "interactive graphics in a single, web-centric environment."

Conclusion

This paper discusses the availability of E-publishing software and devices as another alternative to traditional publishing. Educators can utilize myriad varieties of technology to publish their materials quickly and inexpensively. This paper researches HTML as the basis for most web sites. Considering the limitation of HTML, the paper covers DHTML technology as an addition enhancing interactivity.

The paper finds that there is no need to reinvent the wheel in designing websites because of the existing code that can be reused. Educators can use commercial software packages to easily publish their work. This paper discusses Dreamweaver, Frontpage, and PowerPoint as commercially available software.

EBooks (short for electronic books) are available on the market. This paper discusses three devices including SoftBook Reader, Rocket eBook, and Franklin eBook. In discussing eBook software, this paper covers Adobe Reader (PDF), Microsoft Reader, and Palm Reader. Ebooks have multiple benefits, primarily in the freedom of carrying around, and the ability to view reading materials in a multi-media form.

There is evidence that the industry supports E-publishing in general. There are contrasting views on how E-publishing is used. Although the industry is clear about the benefits and historical value of traditional print, it sees Epublishing as an additional delivery system for published material.

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Strategic Alliances and Partnerships in the New Millennium

Thomas W. Horn
Director, Information Technology
Cleveland Institute of Art
11141 East Blvd.
Cleveland, OH 44106
216-421-7384
thorn@gate.cia.edu
H. Wendell Klingensmith
Director, Strategic Technology Partnerships and Alliances
Case Western Reserve University

Abstract

Managing technology in an educational environment is increasingly calling for the adoption of unique, efficient and creative processes. One such process is the formation of strategic partnerships and alliances. This paper will provide insight into such a process initiated by Case Western Reserve University (CWRU) that has established a collaborative and cooperative environment favorable to the formation of (1) a Strategic Technology Alliance involving educational, cultural, research, health care, governmental and other non-profit institutions within Cleveland's University Circle and the northeast Ohio area; and (2) Strategic Technology Partnerships involving the Strategic Technology Alliance and technology vendors. Similarities and differences between this alliance and other similar consortia will be made. Work accomplished, to be done and benefits realized to date will also be discussed.

Introduction

Presupposing the new Case Western Reserve University President Edward M. Hundert's vision which, in part, states "As a service-oriented institution dedicated to civic leadership**, ...** Our uniquely transforming environment is not limited to the university's own classrooms ..., but includes partnerships with many other great institutions, including those concentrated in University Circle, Greater Cleveland, and Northeast Ohio. ... we build these partnerships in the service of national and international leadership."[1] , the CWRU ITS Department, under the direction of its VP and CIO Lev Gonick, has during the past 1 ½ years undertaken the establishment of a collaborative and cooperative environment resulting in the formation of a Strategic Technology Alliance (STA) and associated Strategic Technology Partnerships (STP).

While certainly not the only consortium-like entity, as there are in excess of 100 higher education associations and consortia in the United States alone [2], it will be shown how this initiative has grown into a process which truly has the potential to be the 'transforming environment' for University Circle, Greater Cleveland, and Northeast Ohio that Dr. Hundert envisions.

In conjunction with the President's initiative to make Case Western Reserve University (CWRU) an integral presence in the greater Cleveland community, CWRU's Information Technology Services (ITS) has begun to develop a framework through which the University has acquired and extended the offer to share a variety of technological products, services and directions for the benefit of the University, University Affiliates, neighboring institutions and various entities located in the greater Cleveland area. This multi faceted program involves the formation of strate-

gic technology coalitions with technology vendors and organizations that share common technology directions and institutional goals with the University.

Overview of Strategic Partnerships and Alliances

The Information Technology Services Planning and Advisory Committee (ITSPAC) of CWRU and its subcommittee structure provided the impetus for all subsequent development in the areas of alliances and partnerships. Information concerning the original charge can be found in Appendix A .

The formation of Strategic Partnerships and Alliances (SPA), which is charged with 're-engineering' the rapidly changing technology procurement processes through joint efforts of the University with University Affiliates and neighboring institutions such as the Cleveland Institute of Art and the Cleveland Institute of Music, has provided the necessary foundation for this process. Through a Strategic Technology Partnership program (STP), the SPA has and continues to develop strategic partnerships with hardware, software, telecommunications and other technology vendors which will enable the University to negotiate business contracts for these items and share the reduced costs and improved efficiency with its Affiliates.

Recognizing the important benefit that an integrated technological environment can mean to greater Cleveland, the SPA has created a consortium, Strategic Technology Alliance (STA), of educational, research, cultural, health care, governmental and other non-profit entities that will provide a forum for discussion of technological infrastructure issues affecting all. The multiple constituencies of the STA are actively committed to creating a sound technological infrastructure not only for educational, research and cultural institutions, but also for businesses, hospitals, and government agencies that exist in the greater Cleveland area.

Thus, the SPA, through the STP and the STA, is building a foundation that will enable CWRU and the greater Cleveland area to become one of the most advanced technological areas in the United States. The SPA is:

1. Facilitating effective communication exchanges between CWRU's ITS and the STA Affiliates regarding technological needs and resources.
2. Participating in University Circle and community wide initiatives aimed at creating and improving the regional technological infrastructure.
3. Developing and maintaining technological partnerships with vendors on behalf of the University and the STA Affiliates.
4. Through collaborative efforts, providing high quality, state-of-the-art technological resources to all entities.
5. Providing proactive technological leadership to the community. [3]

The Strategic Technology Alliance (STA) is an alliance between Case Western Reserve University and Strategic Technology Affiliates. The STA membership is made up of educational, research, cultural, health care governmental and other non-profit organizations who share common technology goals and directions. The STA offers the University and its Strategic Technology Affiliates to jointly benefit from sharing Strategic Technology Partnerships (Products and Services), and information resources and services.

Once the original Strategic Technology Alliance (STA) subcommittee completed its mission, the STA recommended that the STA subcommittee be changed to include STA Affiliate institutional representatives within the University Circle area.

The Strategic Technology Alliance Committee's 2002 tasks were to:

1. Develop a set of recommendations for inclusion in CWRU ITS Strategic Technology Partnerships.
2. Develop a standard STA Agreement with appropriate appendices.
3. Develop processes for inclusion of STA Affiliates' representation on appropriate CWRU ITS initiatives and technology committees.
4. Develop communication mechanisms including:
   a) Web posting of STA Committee minutes, information impacting STA and STA Affiliates.
   b) STA and CWRU ITS joint technology planning.

Concurrently, CWRU proceeded to further develop and enhance their Strategic Partnerships based on the following assumptions. The University and the Strategic Technology Affiliates expect that a Strategic Technology Partnership will be much more than a sales relationship. Our definition of a Strategic Technology Partnership is one that contains a set of cooperative efforts between the University, Strategic Technology Affiliates (Strategic Technology Alliance) and the Vendor. Some of the attributes we look for in potential partners are that the vendor:

1. Have technological goals in line with the University's and the Affiliates' strategic technology directions.
2. Can provide products and services to the University, the Strategic Technology Alliance (STA), the students, faculty and staff of the University and the STA.
3. Are willing to participate with the University and the STA in collaborative technology initiatives.
4. Are willing to commit its organization to a minimum four (4) year agreement to the Strategic Technology Partnership.

These efforts are in recognition by all members of the STA of the importance a sound technological infrastructure that is not only capable of supporting current and future technological demands. This infrastructure must be flexible, robust and innovative enough to support the myriad demands of the local entities that are vital for greater Cleveland economic, educational and cultural development and in keeping Cleveland at the forefront of the technological era.

Accomplishments to Date

The STA Agreement has been developed and finalized. The document basically serves as an agreement between CWRU and the Affiliate emphasizing common strategic technology goals and objectives of the institutions and which allows the Affiliate to participate in the product and service agreements offered by CWRU and its Strategic Technology Partners.[4]

In December of 2002, the STA committee met and outlined governance procedures for a University Circle Strategic Technology Planning and Advisory Committee. This committee is comprised of any University Circle educational, research, cultural, health care, governmental or non-profit institution wishing to participate as demonstrated by agreement with and signing of the STA agreement.

The rationale for the formation of this committee was to ensure the maintenance of the unique interests and initiatives of the University Circle area. Further, the committee serves as an advisory body to the CWRU ITSPAC and will provide representation to the larger STA committee.

Since its inception in November 2002 , the STA has grown to 14 member institutions and another 20+ organizations actively considering membership. The STA and its Affiliates continue to actively solicit participation from Cleveland area non-member institutions (see Appendix B). The STP currently involves 4 corporate partners including Dell Computer, Sprint, Cisco, and Netgear, and another 20+ companies actively pursuing partnerships (see Appendix C).

Activity in other areas within Strategic Technology Partnerships and Alliances includes the formation of OneCleveland (see Appendix D), and planning and development for the University Circle Advanced Technology Commons[5].

OneCleveland is the first step in realizing the goals of the Greater Cleveland Digital Project (GCDP) which are to:

- To create a broadband community by offering high-speed Internet and data services through a wired and wireless network to 75% of the metropolitan area residents by 2010, and to 99% of the community by 2015.
- To increase access to education, cultural activities, research, healthcare, and government services while systematically addressing the digital divide.

OneCleveland is a non-profit organization that is intended to be a partnership among organizations, private and not for profit institutions, government and industry who share a common vision and commitment to a digital 21st century in Greater Cleveland. This vision and commitment will deliver advanced information technology capabilities to help achieve community priorities for economic development, learning, job training, research, and community access.

The focus of the organization is on the communication infrastructure which will allow participating organizations to utilize high speed network communications, including specifically (but not limited to) developing and providing a system for digital telecommunications transport and storage, and related services, to:

- Support the development of Greater Cleveland educational, cultural, research, and healthcare institutions, government-related agencies, and other non-profit organizations by providing high-speed data communications network at the most competitive prices available
- Provide the initial backbone infrastructure to facilitate development of broader high-speed data communications network services that can serve all Greater Cleveland constituents in a manner consistent with the GCDP's goals.

At its core, the University Circle Advanced Technology Commons (ATC) is an effort to broaden the contribution of the University and it Alliance partners to the economic future of the greater University Circle community, to Cleveland, and the region as a whole. It will serve as a showcase and hub for advanced research, the incubation of information technology commercialization

opportunities, new media production, and will provide for enhanced public access and education to science, technology, and the new media.

The ATC is comprised of the following 6 components (see Appendix E for more detail), all of which are still in varying stages of development:

1. Centers of Excellence in Advanced Research and Development
2. Technopolis
3. New Media Center
4. GigaPoP
5. Internet Switching Hotel
6. Network Operations and Data Center

.

Benefits (suggest grouping the following by the initiatives (STA, STP, OneCleveland, UCATC):

Benefits which have been realized to date by participating members of the alliance include:

- Participation in STA by taking advantage of the negotiated partnership agreements has had a very positive impact on our IT bottom line. To date, CWRU and the STA together have realized more than $10 million in savings in their technology purchases.
- Ongoing solicitation of input from STA Affiliates has been helpful in the determination of strategic technology directions for University Circle and Greater Cleveland area.
- Participation in the annual Strategic Technology Alliance Fall Forum (STAFF) allows for the sharing of ideas and information related to institutional strategic planning between CWRU and STA Affiliates and promises to be a very useful and ongoing endeavor.
- Several collaborative efforts have ventures which materialized within the alliance.
  - One of the first such efforts was Kinetic Shadows[5], a collaborative effort between CWRU and the Cleveland Institute of Music wherein dancers from Case Western Reserve University and musicians from the Cleveland Institute of Music performed a new dance work, Kinetic Shadows, simultaneously at CWRU's Mather Dance Center in Cleveland and at the University of Southern California's Bing Theater in Los Angeles. Video special effects were provided by a faculty member of CIA's Digital Media program.
  - One Week[6] was another collaboration between STA Affiliates. One Week stands for "A Week in the Life of University Circle," a collaborative digital media project that explored and celebrated Cleveland's University Circle. It represented a collaborative effort between students from the CIA's Digital Media program, CWRU's New Media Studio, the Cleveland Museum of Art, the Cleveland Institute of Music and with support from University Circle Incorporated. The intent of the venture was to capture the activities of the people and institutions of University Circle during a one week time period.
- Members are actively encouraged to contribute to the Alliance by introducing new potential Strategic Technology Partners (see Appendix C).
- Ongoing, biweekly STA meetings have proven to be very helpful in keeping abreast of latest technological advances and keeping fellow members abreast of events occurring at their respective institutions.

- There has been a fostering of allowing for ready access to technological advice and information from Alliance members.
- There is a developing sense within the Alliance of making a positive contribution to the economic growth of the Greater Cleveland community.
- Finally, there is a growing sense of energy observable within the Alliance by its members being active participants in one of the most ambitious plans for the utilization and leveraging of technology in the public interest in the country and one that can serve as a model for others seeking to form such ventures.
- The collaborative Alliance technology planning is leading to uplifting technological changes in all Affiliates who participate.

Work to be Done

While the underlying mechanisms are by and large in place, there remains more work on the agenda. Some of these agenda items are:

- With the formation of the University Circle Strategic Technology Alliance Advisory Committee, the charter for a larger Strategic Technology Alliance must be revisited and formalized.
- OneCleveland is still a work in progress nearing completion, but the charter members still need to finalize the legal and regulatory structure, business and network lighting of that entity.
  - Not the least of these matters is the completion of a business plan and its attendant financial projections.
- We will continue to extend invitations to potential STA Affiliates both within University Circle and the Greater Cleveland community to enhance the strategic directions and bargaining power of the Alliance.
- As the OneCleveland organization is nonprofit, active exploration and solicitation of potential funding sources is critical.
- Determination of the number of administrative and technical staff must be made along with the attendant recruitment and hiring processes.
- Members must continue efforts to form collaborative arrangements within the Alliance. These efforts would include educational, research, cultural, health care, governmental and corporate joint ventures.

Summary

Case Western Reserve University and the STA Affiliates have a vested interest in contributing to the growth of the Greater Cleveland area and to society at large. This is a shared core value. In the spirit of that core value, we have laid no claim to a monopoly on the ideas that might evolve and develop to support a sustainable, knowledge-based economic future associated with the continued development of the STA, STP, UCATC and One Cleveland. The initiatives outlined above represent some thinking among not only CWRU staff and faculty but also other institutions at University Circle, a number of Foundations, individuals, and indeed, the Greater Cleveland community. We want to continue our efforts to further engage our University Circle colleagues, foundations, public and private sectors, alumni and local technology interests. Case Western Reserve University and the STA want an anchor role in the build-out and future development of the UCATC and OneCleveland. We want to be an equity player and seen as a catalyst for change that we should be in University Circle and the Greater Cleveland region. Most impor-

tant, and at the heart of the vision is our joint commitment to working with the entire community and realizing a partnership model.

References

1. Full text of the CWRU President's Vision can be viewed at: http://www.cwru.edu/its/strategic/CWRU President Vision.htm
2. A fairly exhaustive list of other higher education consortia can be found at: http://www.necop.org/pages.html
3. ITS Strategic Partnerships and Alliances http://www.cwru.edu/its/strategic/about_spa.htm
4. Copies of the Strategic Technology Alliance agreement can be found at: http://www.cwru.edu/its/ /alliance_agreement.htm
5. See University Circle Advanced Technology Commons(ATC): A Concept Paper (April 2002Version 4) at: http://www.cwru.edu/its/strategic/UCATC_concept_paper.htm
6. More information on the Kinetic Shadows performance can be found at: http://www.cwru.edu/its/strategic/i2_performance.htm
7. More information about the One Week project can be found at: http://ciaweb.cia.edu/html/oneweek/

Appendix A

Charge

Strategic technology alliances refer to those "special" relationships between CWRU and a limited number of commercial vendors, educational institutions, and research organizations. The goal of the sub-committee is to advise the CIO on new opportunities, help establish priorities, and support in the cultivation of new strategic technology alliance partners as well as in the continuing acknowledgment and support of long-standing technology alliance partners. In addition, there are some very important and pragmatic work that needs to be done in the area of strategic technology alliance. CWRU's current technology alliances do not contain consistent components; may not be aligned with the goals and objectives of the University; may not serve as strategic relationships as related to the strategic Information Services direction and/or CWRU Information Services Plan; may not contain appropriate legal requirements; do not have standard procedures for their evaluation; may not be aligned with other current technology accords (e.g. utilization of certain CWRU digital information resources); and may not be known to CWRU community members who may be impacted by them. At the present time, there is no standard procedure for the selection of participants (e.g. RFP?) in any future technology alliances, nor is there a standard procedure for the initiation of any future technology alliances.

1 The ITSPAC Sub-Committee on Strategic Technology Alliances shall recommend to the CIO a standard set of components that should be contained in any technology alliances, including but not limited to:

1.1 alignment with University goals and objectives,

1.2 alignment to the strategic Information Services direction and/or CWRU Information Services Plan,
1.3 appropriate legal requirements,
1.4 a business plan,
1.5 and. alignment with other technology alliances;

2 The ITSPAC Sub-Committee on Strategic Technology Alliances shall recommend to the CIO appropriate mechanisms for the involvement of, and communication to, potential impacted CWRU members in the development of yet unspecified technology alliances.
3 The ITSPAC Sub-Committee on Strategic Technology Alliances shall recommend to the CIO a standard process for the evaluation of current and yet unspecified technology alliances.
4 The ITSPAC Sub-Committee on Strategic Technology Alliances shall recommend to the CIO a process for how to deal with new, or as yet unspecified technology alliances, including but not limited to a standardized procedure for the selection of the alliance participants and for the initiation of the alliance.
5 The ITSPAC Sub-Committee on Strategic Technology Alliances shall review on an annual basis the existing technology alliances, and shall recommend to the CIO alliances requiring further review, updates or substantive changes.

Appendix B

A Strategic Technology Affiliate is a member of the Strategic Technology Alliance if the organization has signed and agreed with all of the terms of the Strategic Technology Alliance Agreement.

Strategic Technology Alliance Affiliates	***Date Joined Strategic Technology Alliance***	***Contact***
Baldwin Wallace College	2/18/03	***Robert Agnew*** *Director of Information Technology* ***Baldwin Wallace College*** *275 Eastland Road* *Berea, Ohio 44017* *Business: (440) 826-2310* *Business Fax: (440) 826-3540* *E-mail: ragnew@bw.edu*

Strategic Technology Alliance Affiliates	*Date Joined Strategic Technology Alliance*	*Contact*
Case Western Reserve University	Founding Affiliate	***Dell Klingensmith*** *Director, Strategic Technology Partnerships and Alliances* *Information Technology Services* ***Case Western Reserve University*** *10900 Euclid Avenue* *Cleveland, Ohio 44106* *Business: (216) 368-5404* *Business Fax: (216) 368-8720* *E-mail: Dell.Klingensmith@cwru.edu*
The Cleveland Institute Of Art	11/25/02	***Tom Horn*** *Director, Information Technology* ***Cleveland Institute of Art*** *11141 East Boulevard* *Cleveland, OH 44106* *Business: (216) 421-7384* *Business Fax: (216) 421-7333* *E-mail: thorn@gate.cia.edu*
The Cleveland Institute Of Music	12/17/02	***Aimee Barton*** *Director, Information Systems* ***Cleveland Institute of Music*** *11021 East Boulevard* *Cleveland, OH 44106* *Business: (216) 795-3262* *Business Fax: (216) 791-3063* *E-mail: alb25@po.cwru.edu*
The Cleveland Museum Of Art	02/24/03	***Len Steinbach*** *Chief Information Officer* ***Cleveland Museum of Art*** *11150 East Boulevard* *Cleveland, OH 44106-1797* *Business: (216) 707-2642* *Business Fax: (216) 721-4176* *E-mail: lsteinbach@clevelandart.org*

Strategic Technology Alliance Affiliates	*Date Joined Strategic Technology Alliance*	*Contact*
Cleveland State University	3/5/03	***Mike Droney*** *Vice President for Information Services* ***Cleveland State University*** *2121 Euclid avenue* *Cleveland, OH 44115* *Business: (216) 687-2115* *E-mail: m.droney@csuohio.edu*
The Health Museum Of Cleveland	2/12/03	***Roger E. Zender*** *Director, Information & Learning Technology* ***The Health Museum of Cleveland*** *8911 Euclid Avenue* *Cleveland, OH 44106-2039* *Business: (216) 231-5010 x131* *Business Fax: (216) 231-5129* *E-mail: zender@healthmuseum.org*
ideastream (WVIZ/PBS and 90.3/WCPN)	2/27/03	***Thomas P. Furnas*** *Senior Director of Technology* ***ideastream (WVIZ/PBS and 90.3/WCPN)*** *4300 Brookpark Road* *Cleveland, OH 44134* *Business: (216) 739-3986* *Business Fax: (216) 432-3681* *E-mail: tfurnas@wcpn.org*
John Carroll University	4/14/03	***Richard Valente*** ***E****xecutive Director, Information Services* ***John Carroll University*** *20700 North Park Boulevard* *University Heights, Ohio 44118-4581* *Business: (216) 397-1750* *Business Fax: (216) 397-1734* *E-mail: rvalente@jcu.edu*

Strategic Technology Alliance Affiliates	*Date Joined Strategic Technology Alliance*	*Contact*
Lorain County Community College	1/13/03	***David Weiser*** *Director, Information Services and Systems* ***Lorain County Community College*** *1005 Abbe Road North* *Elyria, Ohio 44035-1691* *Business: (800) 995-LCCC* *E-mail: dweiser@lorainccc.edu*
The MetroHealth Systems	1/27/03	***Vince Miller*** *Vice President/CIO* ***The MetroHealth System*** *2500 MetroHealth Drive* *Cleveland, Ohio 44109-1998* *Business: (216) 778-5007* *Business Fax: (216) 778-3232* *E-mail: vmiller@metrohealth.org*
The Nature Center at Shaker Lakes	4/7/03	***Jan Zorman*** *Facilities Director* ***The Nature Center at Shaker Lakes*** *2600 South Park Blvd.* *Shaker Heights, Ohio 44120* *Business: (216) 321-5935 x29* *E-mail: zorman@shakerlakes.org*
The Western Reserve Historical Society	03/28/03	***Matthew Miller*** *Systems Administrator* ***The Western Reserve Historical Society*** *10825 East Blvd* *Cleveland, Ohio 44106* *Business: (216) 721-5722 x282* ***E-mail: matt@wrhs.org***

Organizations who have indicated an interest in becoming a member of the Strategic Technology Alliance (26):

- BioEnterprise Corporation
- Case Alumni Association (waiting for CAA signature)
- Cleveland Botanical Garden (waiting for CBG signature)
- The Cleveland Clinic Foundation (waiting for CCF signature)

- Cleveland Hearing & Speech Center
- Cleveland Municipal School District
- The Cleveland Museum Of Natural History (waiting for CMNH signature)
- The Cleveland Orchestra (Musical Arts Association) (waiting for CO signature)
- Cuyahoga County (waiting for CC signature)
- Cuyahoga Community College (waiting for CCC signature)
- David N. Myers University (waiting for DMU signature)
- Great Lakes Science Center
- Hanna Perkins Center for Child Development
- Lakeland Community College (waiting for LCC signature)
- NASA-Glenn Research Center (waiting for NASA signature)
- Notre Dame University (waiting for NDU signature)
- OARnet (Ohio Academic Research Network) (waiting for OARnet signature)
- Oberlin College (verbally interested, waiting for introduction to STA meeting)
- OneCleveland (waiting for OneCleveland 501c3 organization filing)
- Siegal College of Judaic Studies (waiting for SC signature)
- University Circle, Inc.
- University Hospitals Of Cleveland (waiting for UH signature)
- Ursuline College (waiting for UC signature)
- The Western Reserve Historical Society (waiting for WRHS signature)
- Wright State University (waiting for WSU signature)

Appendix C

The following shows the status of vendors under consideration for partnership with the Strategic Technology Alliance.

VENDOR	PRODUCT/SERVICE	REQUESTED BY	STATUS
Ad Astra	Room scheduling software	CIA	Agreed to CIA purchase, working on STP Agreement
Allied Telesyn	Networking equipment	CWRU	Completed discussion; waiting technical recommendation
BARCO	Projection equipment	CWRU	Initial STP Meeting on 2/20/03
City Signal Communications	Dark fiber optic cable, cable construction	CWRU, OneCleveland	Verbal agreement, CSC examining STP agreement
EMC	Information storage systems, software, networks, and services	CWRU	Verbal agreement, EMC examining STP agreement
InfiNET Solutions	Billing software, billing ASP	CWRU	Verbal agreement, working on STP Agreement

VENDOR	PRODUCT/SERVICE	REQUESTED BY	STATUS
IntelliNet Corporation	Managed service provider for enterprise networks	CMA	Presentation being arranged by CMA
Luna Imaging, Inc.	Digital imaging software and services	CMA	2/26/03 10:30a-12:30p Presentation @ Cleveland Museum of Art (Recital Hall)
McPc	Technology services	CIA	Completed discussion; no further action
Motion Computing	Tablet PC vendor	CWRU	Verbal agreement, Motion Computing examining STP agreement
Newbury Networks	Location enabled networks	CMA	3/4/03 Security Meeting @Cleveland Museum of Art
Oracle	Database software, collaboration software and other software and services	CWRU	
OARnet	OARnet POP @ CWRU	CWRU	Verbal agreement waiting written confirmation
Sarcom	Technology Services	CIA	
Sun Microsystems	All products, Center of Excellence	CWRU	Verbal agreement, Sun examining STP agreement
XO Communications	Full-service provider of communications services	CWRU, OneCleveland	In preliminary discussion
WinZIP	WinZIP	CIM	WinZIP refused to partner

Appendix D
OneCleveland

Overview

OneCleveland is a non-profit organization (501(c)(3) application pending) intended to be a partnership among organizations, private and non-profit institutions, government and industry sharing a common vision and commitment to a digital 21st century Greater Cleveland. OneCleveland has a two-part mission associated with its short- and longer-term objectives to:

Support the development of Greater Cleveland educational, cultural, research, and healthcare institutions, government-related agencies, and other non-profit organizations by providing high-speed data communications network at the most competitive prices available.

Provide the initial backbone infrastructure to facilitate development of broader high-speed data communications network services that can serve all Greater Cleveland constituents (e.g., commercial enterprises, individual consumers) in a manner consistent with the GCDP's goals.

Charter Members

* Case Western Reserve University
* City of Cleveland
* Cleveland Municipal School District
* Cleveland State University
* Cuyahoga Community College
* Greater Cleveland Regional Transit Authority

The Product/Service

OneCleveland will provide its members with high-speed data transmission services via a regional "ring" of what is currently dark fiber. The regional ring has a tremendous amount of available capacity and will allow OneCleveland members to improve the overall performance of their data services while also decreasing their costs. Specific benefits include:

- Ability to connect multiple locations (within an organization and between organizations) in the region without having to go through commercial vendors or use the Internet.
- Access to the Internet, Ohio's Third Frontier Network, OARnet, Internet2 and other high-speed networks
- Price advantages over existing alternatives.

While the initial product is specifically defined as high-speed data transmission, the opportunity exists for additional network services in the future. Some of these might include: network integration planning and support; application development; and data warehousing.

Target Market

The target market for OneCleveland is limited to Greater Cleveland educational, cultural, research, and healthcare institutions, government-related agencies, and other non-profit organizations. Specifically, OneCleveland will focus on those entities with a current high cost and high usage of data and data communication services or those that expect significant growth in the near future. It will not target commercial entities or individual consumers. However, as OneCleveland's backbone regional infrastructure is developed, it may partner with other initiatives/entities for the purpose of providing high-speed broadband services to broader audiences.

Pricing/Costs

OneCleveland's price advantage lies in its approach of securing long-term access contracts to existing "dark" fiber. While the upfront costs of securing the contracts along with the acquisition of necessary data communications are still large, they have a very short payback period when compared to other alternatives. In addition, by leveraging the requirements of multiple members, the synergies only increase.

While the specific pricing models are yet to be finalized, they will have two key components:

1)Network usage fees based on capacity required - this represents the upfront fee that OneCleveland will have to pay to establish the network and could be paid as a one-time fee, amortized over a short-time period (e.g., 5 years), or some combination.

2) Ongoing network maintenance and support - fee to cover the ongoing operation and support of OneCleveland and the network.

OneCleveland is analyzing whether to include the cost of member-specific access lines in the business model. These are the data lines (laterals) that cover the "last mile" and connect the member's specific location(s) to the OneCleveland network. However, in order to facilitate this process and ensure that it is cost-efficient for its members, OneCleveland will set up arrangements/contracts with providers of these links to ensure reasonable prices and financing arrangements that are consistent with OneCleveland's value proposition.

Technology

OneCleveland will use Dense Wave Division Multiplexing (DWDM) technology to "light" the dark fiber network. This technology is the same as being used by OARnet, maximizes the capacity available in the fiber and allows the assigning of dedicated lambdas (virtual networks) to particular applications. For example, a critical remote medical procedure would not be competing with lower priority traffic such as e-mail or web browsing. Each lambda can be customized to meet the unique requirements of the advanced applications it is supporting. The bandwidth that will be available to an individual institution and user is over 100,000 times greater than generally available Internet capabilities.

Strategic Technology Partners

OneCleveland will become an Affiliate in Case Western Reserve University's Strategic Technology Alliance (STA). The STA will allow OneCleveland to partner directly with STA's Strategic Technology Partners (STP) (e.g. Cisco, Dell Computing, NETGEAR, Sprint) for

Reduction of costs of electronics, software, maintenance and other services
Participation in joint engineering planning
Utilization of the provision of equipment and software for inter-operability labs
Utilization of alpha and beta product testing
Utilization of STPs' other financial support (e.g. presentations, seminars)

Funding

OneCleveland's mission is 100% inline with the goals of Governor Taft and the Third Frontier initiative. Because of this, OneCleveland hopes to be able to access State funding to get it started. Along with some additional private monies, OneCleveland will be able to get the network up and running and quickly move to an ongoing cash-neutral position where the fees from members offset all expenses.

Funding will also be sought from:

- Local funds
- State funds
- Federal funds
- Private funds
- Strategic Technology Partners

The specific amount of the initial funding requirement is still being determined.

Appendix E

Components of the University Circle Advanced Technology Commons

Centers of Excellence in Advanced Research and Development

1. Showcase for collaborative scientific and technological research done in University Circle
2. Faculty driven technology needs for research and development
3. To date there are 6 centers of excellence.
   - Center of Excellence in Advanced Network Applications in the Fine and Performing Arts.
   - Center of Excellence in Advanced Networking Research
   - Center of Excellence in Advanced Wireless Applications
   - Center of Excellence in Discovery through Advanced Visualization
   - Center of Excellence in Learning Tools and Advanced Network Technology
   - Center of Excellence in Remote and Simulated Medical Interventions

Technopolis@University Circle

1. Museum/exploratorium/job training center
2. Virtual reality centers, exhibits
3. Intense exposure to science, technology, discovery
4. Screen literacy environments
5. Public access “discovery zone”

New Media Center

1. Digital production facility for use by faculty and University Circle partners

University Circle GigaPoP

1. Connections to high speed state, national and international networks
   1. OARnet
   2. Internet2 (through OARnet)
   3. Global Medical Research Exchange Network
   4. National Light Rail Project
2. Integrate Internet service for all 45 Circle institutions into one fiber ring
3. Financial and operational efficiencies
4. Improved connectivity and collaboration
5. City-wide “dark fiber” connections for education, research, cultural and public institutions
6. Spread benefits of ATC to entire community
7. Link institutions to future markets, resources

Internet Switching Hotel

1. Carrier neutral switching facility
2. Ohio Academic Research Network (OARnet) hub
3. Cleveland Education and Research Network hub
4. Cleveland Education and Research Network
5. OneCleveland Project Network hub
6. E-Commerce Network hub
7. E-government Network hub
8. Sprint hub

9. Core facility to carry Internet traffic in NE and MW regions; speed international service as well
10. Support region's IT needs and its capacity to connect to the world
11. Work with Geographic Network Affiliates
12. Build major Internet switching facility
13. Link hotel to a co-generation facility in Circle

Network and Computing Operations Center

1. 24x7x365 operation
2. Network Operations Center for CWRU, ISH, UCG and Strategic Technology Alliance
3. Computer Operations Center for CWRU and Strategic Technology Alliance
4. Relocate CWRU network and computer staff (~150-200 people)
5. Become operations center for one of nation’s largest data storage programs
6. Provide service to all Circle institutions (CWRU to become anchor client)
7. Opportunities for small firms to collaborate with research-intensive institutions

Media Presentation Made Easy with Vegas Video

Janet E. Hurn
Physics Department
Miami University Middletown Campus
513-727-3341
hurnje@muohio.edu

Vegas Video is a product made by Sonic Foundry. It is a digital video editing system. One might wonder how a system like this can be very useful in an educational realm. I have found it to be extremely useful and easy to use. I will discuss how to get started using Vegas Video as well as give examples of how I have used it in my teaching. I will talk about the equipment needed as well.

What is Vegas Video?

As I said, this is a digital video editing system. That means that it allows you to seamlessly put together sound, video, pictures, and effects to produce professional looking presentations. These presentations can then be delivered in many different formats. They can be streamed over the Internet, burned to CD, recorded on VHS, or now with the new version, made into DVDs. The beauty is that you can decide later. Once you produce a presentation, it can be rendered into the various formats as you need them. That was one of the main attractions for me. Create once, produce any format I need.

Why do I need multimedia presentations?

Many instructors don't see the need for flashy multimedia presentations. But let's face it; we are competing against DVD, TV, Internet and video games. That is where our students are getting their information. We cannot assume that they understand a three dimensional concept when they just read it in a book. We may have to enhance it a little. Now in the day and age of online learning, we must be able to address all the learning styles of our students. With video we can let them "see" us even though we are not in a formal classroom. They can feel more connected. I teach an online physics course. They deserve some demonstrations and lab experiments to complete their experience. I can give them that via video.

Is Vegas Video simple to use?

Most of us don't have time learn fancy software. I have stated before in other ASCUE presentations that two things attract me to a particular software title: how easy is it to learn and where does it fall on the power/cost continuum. I have a limited budget and I do not have a lot of time. Vegas Video is easy to learn and inexpensive for the number of features that are included. Currently Vegas Video is only $150 academic pricing. It is so easy to learn, I had made a little video clip in 10 minutes. Now of course the video was nothing I could use in the classroom, but it was pretty intuitive. As you further explore the product you will find there are many more features that you can integrate as you grow. Everything is pretty much drag and drop. It has a great pre-

view feature that allows you to see how it looks before you render the final product. But let's slow down for a minute.

What is the first step?

Once you are serious about starting a project it is important to plan. Choose a small concept or demonstration that you want to make a presentation about. As in Hollywood, I recommend a script. Choose whether you want pictures, video, narration, music, or any combination. Make a storyboard of each "scene". Write a narration if you need to for your presentation. Now, collect your media. If you need video, get a video camera and shoot your video. I recommend digital video but you can use VHS also. If you can, use video that is already available, that is even better. (Watch for possible Copyright infringement!) Take still shots if you need them. I recommend a digital camera. Make PowerPoint slides if you have some notes or steps that you want to illustrate. These can be integrated with your other media.

After you collect all your media, get them all on the same computer with the Vegas Video. If you have digital video, you will need a FireWire card to transfer the video. If you want some simple video, you could use a video cam and save directly to the computer. All digital cameras are different. Get the pictures on the computer as your camera manual instructs. If you have PowerPoint slides you need to save them all as individual JPEGs. In PowerPoint select SAVE AS and choose jpeg in the drop down list. It will save all the slides in a new folder. Now you can add them as you wish either together or separated by video or other visuals. There is no need to add your pictures and video to the PowerPoint slides themselves. You just use PowerPoint if you need outlines or notes in your presentation. I highly recommend that you put all the parts of your presentation in the same folder of your computer, but it is not necessary.

Now what?

Now we can look at the Vegas Video interface. I like the desktop for Vegas Video. All the controls are right at your finger tips. Let's start with the bottom left corner. Here we have the **Explorer** window on top. It is just like the explorer window you are used to. It shows all the folders and files on your computer that are available for you project. That includes sound files, pictures, videos, etc. If you highlight one of the files, you can preview that file before you even add it to your project. Perhaps you are like me and do not remember what each file is. This is a handy feature.

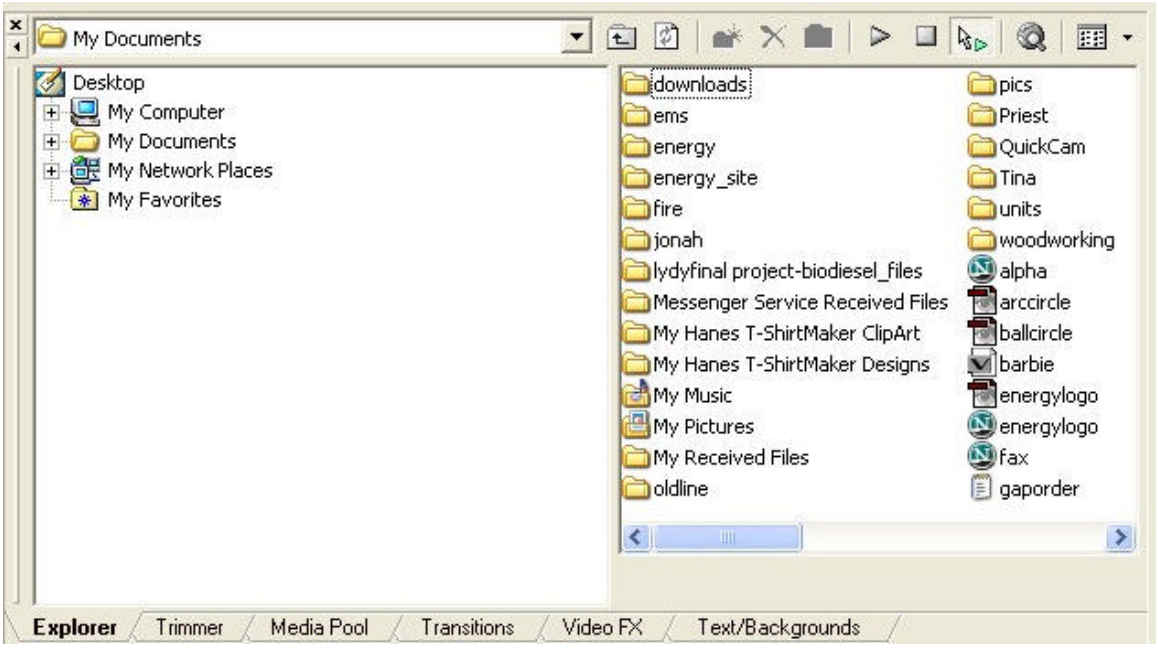


Figure 1

As you see in Figure 1, there are other tabs in the lower left corner to choose from. The **Trimmer** allows you to place a movie clip that you want to use in it first for editing purposes. You can cut portions out and choose just the part you want for your project before placing it in the project. You can do this up in the main workspace but it is probably easier to do it before you add it.

The **Media Pool** contains any file you have added to your project. You can see what you have used. This is especially handy if your project gets big. The best part is that your original files remain completely unchanged. Even if you trim a video clip, the original remains intact while the trimmed copy is used in your project. I like that.

The **Transitions** are supplied by Sonic Foundry (see Figure 2). They are for your use to transition between items in your project. These transitions can make your project look just a little more professional with little effort. You can move your cursor over the transition for a preview and simply drag and drop what you choose into your project. If you are more advanced, you can make adjustments to their transitions to make them your own. Simply double click the transition after you have added it to your project. Overlap your media to make the transition more effective.

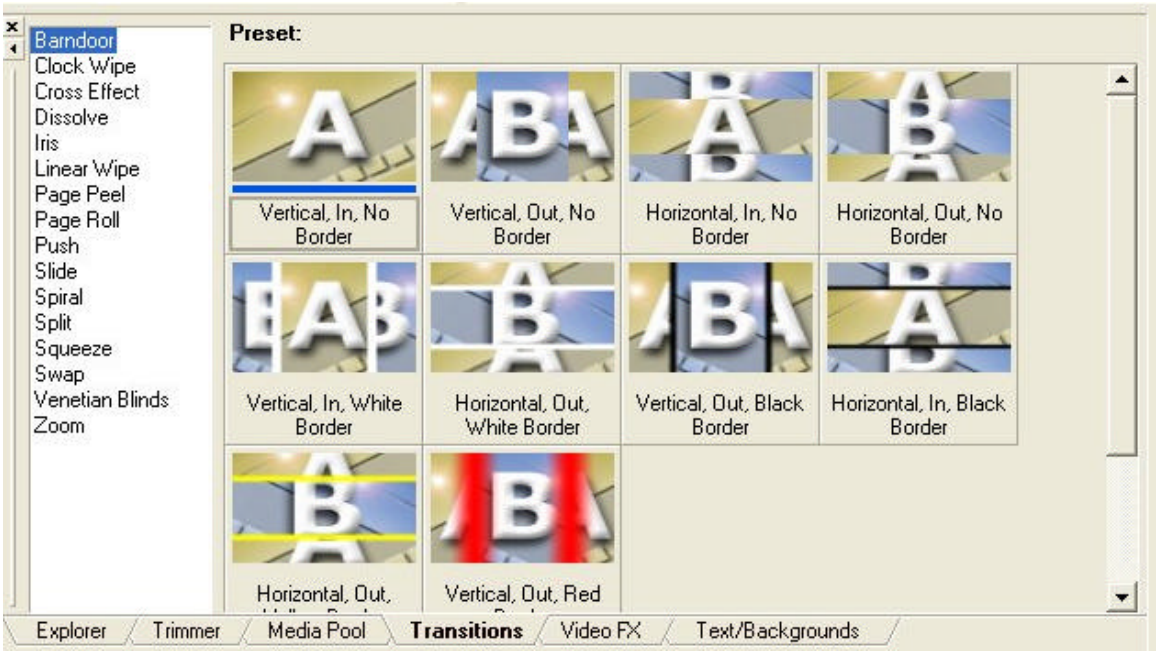


Figure 2

The **Video Effects** are some more "canned" effects provided by Sonic Foundry. They allow you to add different art effects to your video and pictures. I do not find them terribly useful for my purposes, but they are fun to play with.

Text/Backgrounds are useful. They are also provided by the company. You can use these to add credits, bylines, or small bits of color or text to a video or set of pictures. Again this is a simple way to make your presentation look very professional. As you teach your name can flash up in front of you or perhaps the date of the lecture. The possibilities are endless.

The lower right corner of the desktop is the **Preview** area (see Figure 3). It also contains the sound controls. This live preview area is fantastic to watch part or all of your project as you create it. Sometimes things are not as they appear. This area helps you adjust timing and effects before you spend the time rendering your final presentation. This is one feature that sets Vegas Video apart from other products.

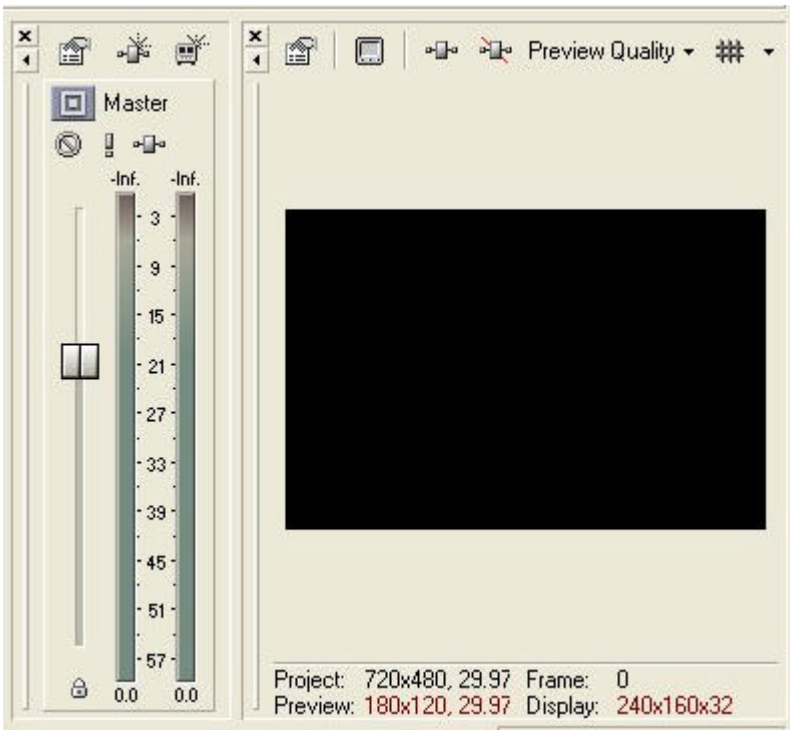


Figure 3

The window sections on the desktop are fully adjustable so that you can emphasize the areas you are working with. You can shrink the sound master or make it bigger. The same goes for the preview pane.

Finally, the most important part of the desktop is the timeline workspace. This is where you drag and drop all your elements. As you see in Figure 4, each type of media has its own line.

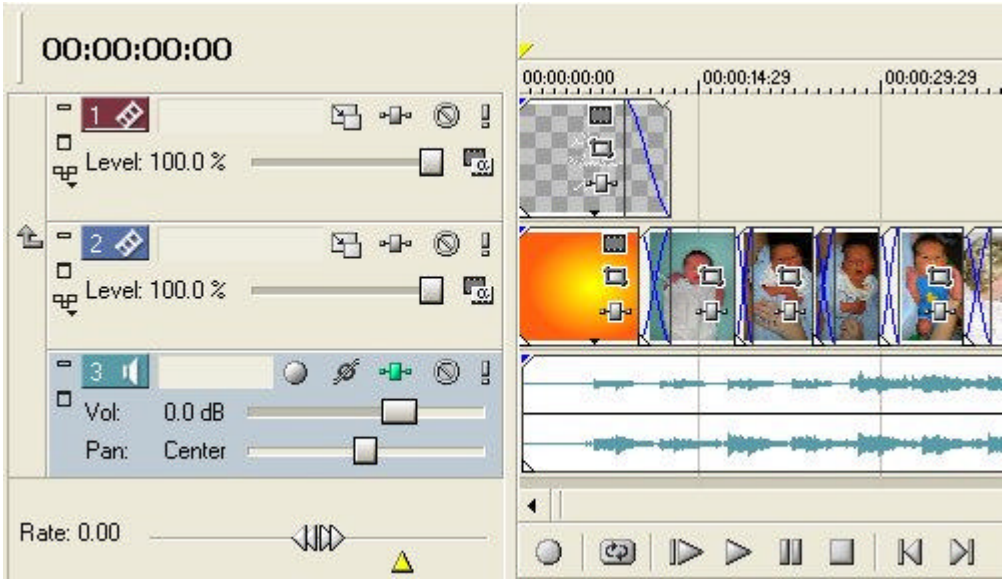


Figure 4

The first two lines in this project are for video. The third section is for sound. You can have unlimited sound or video lines in your project. The lines are actually layers. The top most layer will cover the next, etc. So you can do some simple layering that can produce some dramatic effects. For example, it is easy to overlay a small video of the instructor lecturing over some PowerPoint notes. The first layer in the project above is simply some text that will appear over the video below it. The possibilities are endless. I like the ability to have a narration in one sound layer and perhaps some music in another. I do not have to worry about playing the music while I narrate. They are completely independent. I can then control the levels of each sound layer individually as well. At some point I could even change the narration and not affect the rest of my hard work.

Now that you know the basics you can start dragging and dropping media onto the timeline workspace. As you drag and drop the program knows whether you have video or sound elements and places them accordingly. In the lower right corner of figure 4 you can see the controls for the time line and preview. They are just like VCR controls. You can play, pause, stop, or loop.

Ok, my first presentation looks great! Now what?

Now, it is time to render. This is where you create a movie or file for playback. There are so many choices for rendering that I cannot talk about the pros and cons of each here. Besides, I am not an expert. The beauty of all the choices is that you can create multiple presentations in multiple formats without changing your projects. First a decision has to be made as to whether you want to stream your presentation over the Internet. If this is your purpose, then your two choices would be Real Media or Windows Media. These are the most common types of streaming media. If you just want to put your media on a CD or run it from a computer, then you have many choices. The common formats include: QuickTime (.mov), Microsoft (.wav), Video for Windows (.avi), MP3 audio, .mpg. Decisions also have to be made as to how big you want your presentation to be versus how large and clear you want your video and audio to be. Obviously if you want a full screen, high resolution video with stereo sound, you will need lots of space to save the large file.

Suggestions for Use

I use Vegas Video to enhance my online physics course *Energy and the Environment.* One of my deterrents to online teaching was that the student/teacher interaction was not as dynamic as in face-to-face courses. We could have chats and discussions online but they never saw me, experienced a demonstration, or saw how exciting physics can be. I solved some of my dilemma by making short video clips and putting them on CDs for all the students. Throughout the course they could watch demonstrations and lectures that went with the current module they were working on. As more people get high speed connections, I can stream some of the material. That would make it possible for me to create material during the class and stream it immediately without worrying about having the CD completed before the class begins.

Another possibility is to video a lab experiment and then have the students analyze and write formal lab reports as if they had been there. It is always better for the students to do this on their own but this would be an alternative. If what you teach is procedural such as nursing, this would

be a great way to show a procedure or lab before the students have to do it themselves or as a refresher later.

The possibilities are endless. Vegas Video was a lifesaver for me and my online class. I hope it can help you too.

PC Hardware & Software Courses that Lead to A+ Certification

Mary Insabella
Ty Fogle
Columbus State Community College
550 East Spring Street
Columbus, OH 43215
(614) 287-5207 / 5781

Abstract:

In the light of growing demand from employers for IT certifications, Columbus State Community College's CIT department has redeveloped 2 courses designed to guide students to an A+ certification. This presentation will discuss the objectives of both courses in relation to CompTIA's exams and the benefits in linking courses to certifications. The PC Operating Systems class includes discussion of Windows 9x, NT, 200 and XP. Students learn how to install, troubleshoot and support each OS. Topics such as using windows on a network and the Internet are included. The OSI model is covered in detail, as well as hard drive support.

The PC Maintenance Course had been taught with hardware and operating system A+ objectives broadly covered. The redesigned course is designed specifically to teach the objectives of the CompTia A+ Core Hardware exam, including identifying, installing and troubleshooting hardware components. This presentation will discuss the redevelopment and linking of the courses, as well as the CompTIA objectives taught therein. We will be focusing on test competencies, courseware, and job opportunities. Sample A+ test questions and employment statistics will be provided.

A+ Certification Defined

The Computer Technology Industry Association (CompTIA) is a non-profit organization whose defined purpose is "fostering and growing the IT industry by promoting industry standards, growing professional IT expertise, providing IT skills education and developing relevant business solutions."

The CompTIA A+ certification is the industry standard for validating vendor-neutral skills expected of an entry-level computer technician. The intent of the certification is to ensure employers and consumers that A+ certificated technicians have a broad base of knowledge and competency in hardware and operating system software, and demonstrate abilities in installation, configuration, diagnosis, preventive maintenance and basic networking.

CompTIA is the largest developer of independent (non-proprietary) IT certification exams. Experts from industry, academia, training and government work with CompTIA to develop and redevelop tests that evaluate the skill sets required for certification, based on each group's content knowledge. More than 500,000 people have taken the A+ certification exams since 1993.

Why Focus on Certification?

The Computer Information Technology (CIT) department at Columbus State Community College learned, from a suggestion by the CIT Advisory Board, that local Columbus companies and government agencies had an interest in hiring employees with certifications, including A+. The department's advisory board includes members from Bank One, Nationwide Insurance Company, OCLC, Cardinal Health, Grange Insurance Co. and the State of Ohio. These members employ a sizable IT population in Columbus.

The advisory board meets twice a year to discuss various issues, including advising the department as to outcomes deemed appropriate for students desiring IT employment. These companies want to hire employees with an associate's degree and certifications, if possible. If left to choose, some feel that the associate's degree is more important because of the soft skills component, but more and more it seems that companies want certifications so they can spend less time and money on actual technical training.

To this end, the presenters took the initiative and upgraded the content of two courses, already in the degree curriculum, to guide students toward the A+ certification exams' objectives. The faults with the previous courses' content was that they were too general and did not address all competencies required of the A+ technician and sometimes did not connect with each other in a meaningful way. These courses have been in the department's plan of study for many years, but are now linked with each other, and courseware, to prepare students to sit for the exams. The two courses are MCT121 PC Operating Systems and MCT215 PC Maintenance.

Course Content

The MCT121 course uses the textbook, *A+ Guide to Software: Managing, Maintaining, and Troubleshooting* authored by Jean Andrews and published by Course Technology. The course's learning outcomes include:

- Describe the purpose and operation of the Disk Operating System (DOS); use the basic DOS commands and build batch files for automatic use of DOS.
- Describe the purpose and operation of Microsoft Windows, 9X, 2000, NT and XP and use this environment to work with Windows directories, folders and files.
- Support hard drives from a software point of view.
- Support and troubleshoot Windows on a network and the Internet.
- Explain the Linux and MAC operating systems.

The course is evaluated by a mid-term, final, and 18 hands-on projects. The hands-on projects include creating and administering a peer-to-peer network, using Windows XP and using diagnostic tools to troubleshoot system resources.

MCT 215 uses the companion textbook by Ms. Andrews—*A+ Guide to Hardware: Managing, Maintaining and Troubleshooting*. The outcomes of this course are:

- Identify the many different hardware components of a computer and explain their functions and interrelationships.
- Understand and explain how operating systems work with computer hardware.
- Measure electricity and understand the electrical system of the computer
- Identify various motherboards and motherboard components, and install and troubleshoot a motherboard.
- Identify and install peripheral I/O devices.
- Understand, upgrade and troubleshoot memory.
- Understand hard drive technologies and be able to install and trouble shoot hard drives (Including SCSI).
- Understand how networks are structured and how to connect PCs to a LAN.

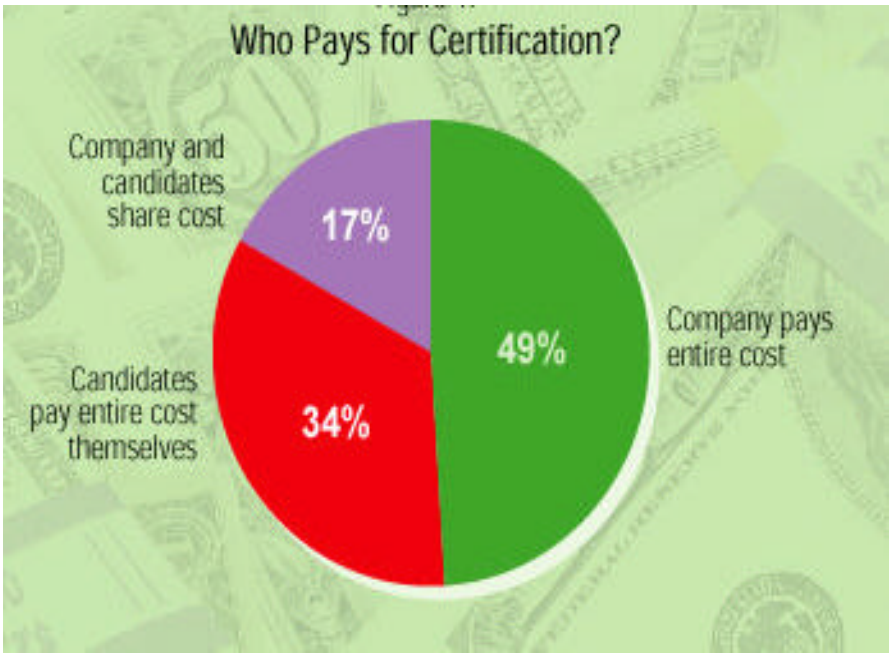
The hands-on assessment for this course is very practical and aimed at providing PC technical experience. In addition, theoretical exams are taken to provide a foundation for the terms, concepts, and competencies necessary for an A+ technician. The next section covers why we believe A+ certifications are beneficial to both organizations and the individual

Benefits of A+ Certifications

CompTIA has commissioned several market studies that look at the value of A+ certification among various groups. One study, conducted by Future Works, looked at the effect of A+ certification on people with low income, a population strongly represented at Columbus State. This study examined the training of young adults with little work experience and no higher education. Future Works used trainee interviews and visits to training facilities to gather information on the success of training.

Although the Future Works study found that these subjects were able to find good-paying jobs without prior work experience and higher education, some recommendations made by the researchers were that companies should provide more one-on-one mentoring, more hands-on experience and increased financial assistance to enable the subjects to realize the full benefits of the certification and to provide the greatest benefit to the employer. So-called "soft skills," such as writing and presentation, need to be included to make trainees more fully rounded employees. Indeed, the CIT department at Columbus State is committed to its graduates having these skills. To this end, it is much more preferable that students complete a degree in addition to certification.

Another study, conducted by certmag.com, indicates that employees themselves understand the value of certification and are willing to pay for it when necessary or given the opportunity. The figure below shows the ratio of certificants who paid for at least some of their own certification was 51%, with the majority of those paying the entire cost.



This suggests that employees expect to derive economic benefit from certifications, and their expectations are well founded. As the next figure indicates, Certmag.com also found that salaries increased from a certification, even when the person already had the job.

The A+ certification is definitely entry level in the certification world, but is widely regarded as a stepping stone for additional certifications and provides a knowledge base for real world experience. The salary averages for the A+ certification have not dampened much in the IT slump of the last three years, and not all positions are being filled.

Certification Programs–Salaries at a Glance

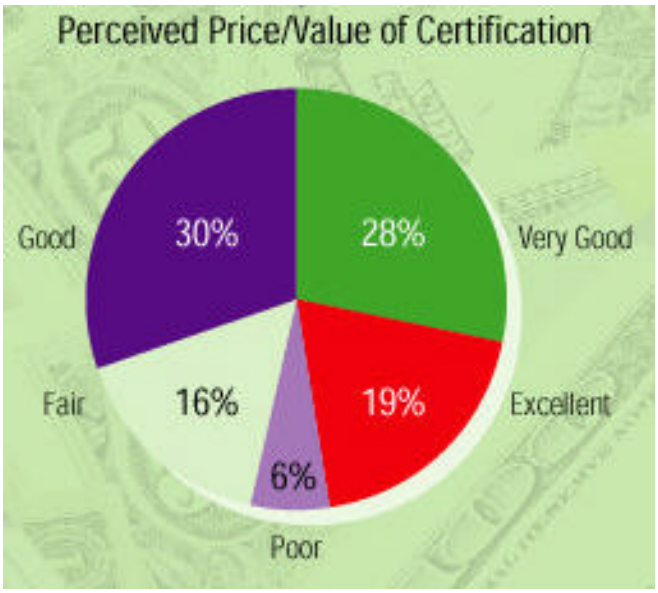
PROGRAM PROVIDER	CompTIA	PROSOFT	NOVELL	RED HAT
PROGRAM	A+	CIW	CNE	RHCE
ANNUAL SALARY	$40,967	$44,257	$60,962	$61,470
AVERAGE COST	$300	$2,394	$2,847	$2,357
AVERAGE 1ST YR RAISE	$1,615	$3,133	$7,148	$3,242
SALARY WITH EXPERIENCE				
<3 YEARS IN IT	$37,291	$36,789	$39,999	$45,650
3-5 YEARS IN IT	$38,557	$45,971	$56,309	$56,239
5-10 YEARS IN IT	$46,249	$54,117	$58,604	$64,832
10+ YEARS IN IT	$49,820	$62,082	$66,015	$78,630
SALARY WITH CERTIFICATIONS				
1 CERTIFICATION	$37,670	$44,125	$57,352	$57,999
2 CERTIFICATIONS	$41,319	$44,218	$62,585	$59,377
3+ CERTIFICATIONS	$44,121	$48,061	$62,999	$69,028

In another research effort, NFO Prognostics joined CompTIA in building a Web-based questionnaire that concentrated on A+ certification impact on career, benefits and job satisfaction. The questionnaire was sent to people certified in either A+, Network+, i-Net or CDIA+. A total of 1147 people responded to the questionnaire. The researchers divided the respondents into four groups:

- Young, lower educated, getting started
- Older, self-employed/in career transition
- Young, professional/corporate
- Older, educated, professional/corporate

Respondents ranked “knowledge gain” and “credibility/validation of knowledge” highest among benefits gained from their certifications. They also highly ranked “certification meeting overall expectations” and “increased in effectiveness at your job after becoming certified.” Fully 85% of respondents would recommend certification programs. Sixty-five percent of respondents said their certification had “some impact on their career.” They wrote comments such as “increased knowledge,” “increased job opportunities” and “personal market value.”

The certmag.com survey echoes these results and found that 78% of respondents found their certification experience better than “Fair.”



CompTIA commissioned Harris Interactive to conduct a market study of unfilled IT positions in U. S. companies. The researchers conducted an online survey of IT and HR professionals in a variety of industries. They reported responses from 664 people. The objectives of the survey were to:

- Determine the level of interest in the proposed IT apprenticeship program
- Determine the IT career categories that are used in organizations
- Determine which positions are perceived as being entry-level
- Identify career clusters that may be industry-specific

The study found that there were an average of 14 unfilled IT positions in U.S. companies. The average number of entry-level positions is 8.5. Entry-level positions were considered to be help desk technicians, computer operators and PC technicians. The study also found that it takes an average of 6.6 months to train an entry-level employee and the average cost for external training is $4,568 per employee.

Other findings include the fact that companies lose 12 IT employees to other companies every year and that firms reported that 8.1% of their IT staff performed unsatisfactorily. The researchers recommended addressing these shortages by creating IT apprentice programs that included course work in A+ certification.

Conclusion

The presenters have determined that A+ certification is beneficial to all parties involved and is indeed necessary for a graduate in an entry level IT position. Being a community college, Columbus State's focus needs to be on providing tools to the job seeker that will enable him or her to succeed and will give an employer the best possible product we have to offer.

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Faculty Access to Files: Anywhere -- Anytime

Sali Kaceli
Manager of Academic Computing
Philadelphia Biblical University
200 Manor Ave.
Langhorne, PA 19047
Tel. (215) 702-4555
Email: skaceli@pbu.edu
http://www.pbu.edu

Abstract

This session will highlight a new technology provided by Novell Inc. that allows the faculty and students of Philadelphia Biblical University access their files from anywhere, anytime both securely and with very little configuration on the user end. This technology solves many problems related to faculty ending up with many versions of the same document, disks going bad, etc. By using Novell iFolder the faculty is given the freedom of accessing the files in a variety of ways: client based access, web based and through Netdrive. A demonstration of the system implementation, functionality and how it developed will be presented in this seminar.

Introduction/Background

Philadelphia Biblical University (PBU) is one of many institutions striving to bring technology in the classroom while teaching Biblical truths. The university has about 1300 full-time students offering various degrees from undergraduate to graduate. With the increase in the number of programs and with the development of technology, a new need arose whereby the faculty, staff and students needed access to their files from anywhere at any time. Floppy disks or zip drives were not able to meet this need. Transparencies were outdated. Besides that there were cases where faculty had to deal with multiple versions of the same presentation and other issues. The Information Technology Department, a staff of 5, is striving to support every aspect of computing: infrastructure, database, web, hardware, server upgrade and maintenance, training, and student computing.

Most of the faculty have one computer in the office, another computer that they may use with a projector in the classroom, another at home and a laptop. A problematic scenario might include difficulty in accessing a file on the personal laptop computer, or accessing an outdated version of a file while attending a conference.

In light of this, since we have a licensing agreement with Novell Inc. that provides access to a suite of good stable applications. One of them being iFolder. It initially came out as part of Netware 6 but can also be purchased as a separate product. The advantage of this system meant that there would be less problems for faculty to experience and less disks we had to troubleshoot. It meant that it would meet needs by having files follow the user wherever they were as long as they have some kind of Internet connection.

The Project

Just like any other project in IT, we had to start with the testing phase. We installed and then tested it with a few user accounts and then running live with a few users willing to try. We started the project in Nov. 2001 where certain faculty were willing to try this new technology. One aspect of the project was that whatever we were going to use it had to be relatively simple and require very little from the user. However, a few considerations had to be kept in mind:

a. security
b. integration with current system username and password
c. reliability and being able to use the files if no connectivity existed

Using primarily Novell and NDS for our account information, the security was not much of a problem. SSL (Secure Socket Layer) was already provided with the product. Since SSL certificates are quite expensive, we had to use one from our system, but the disadvantage was that the user is prompted to accept the certificate. This was solved by simply posting a note on the website. This is just one of the methods of accessing the files over the web. Using the client (2MB file) or the Netdrive does not present this problem.

Integration

Novell iFolder utilizes LDAP authentication, and since we were using Novell Directory Services (NDS) that was not a problem. With version 2.0 of iFolder, one can also configure it to run on Windows 2000 server and utilize the Active directory LDAP, or you can run it on Linux systems. The system is also scalable to handle thousands of users and at the same time requiring little or no configuration on the IT end.

Ifolder Benefits for the Institution

1. Seamless data access
2. Data Safeguards and data recovery
3. Reliable data security
4. Cross platform support
5. Simple data and account management
6. No training requirements

Seamless Data Access

Novell iFolder empowers our faculty and staff and student by enabling their data to follow them wherever they go. Our users no longer e-mail themselves project files so they can work on them from home and the frustration associated with sorting through different versions of the same file on different machines has been significantly reduced. iFolder stores and synchronizes users' work in such a way that no matter what client or what location they log in from, their files are available and in the condition that they expect them to be.

Data Security and Recovery

iFolder uses encryption to store the data on the server. As such, the data is secure from unauthorized access, but it can also be easily safeguarded from system crashes and disasters that can result in data loss. When one of our faculty saves a file locally, the iFolder client can automatically update data to the iFolder server. This data immediately becomes available for nightly backup by the university IT staff.

iFolder makes it easier also for IT managers to ensure that all of an organization's critical data is protected.

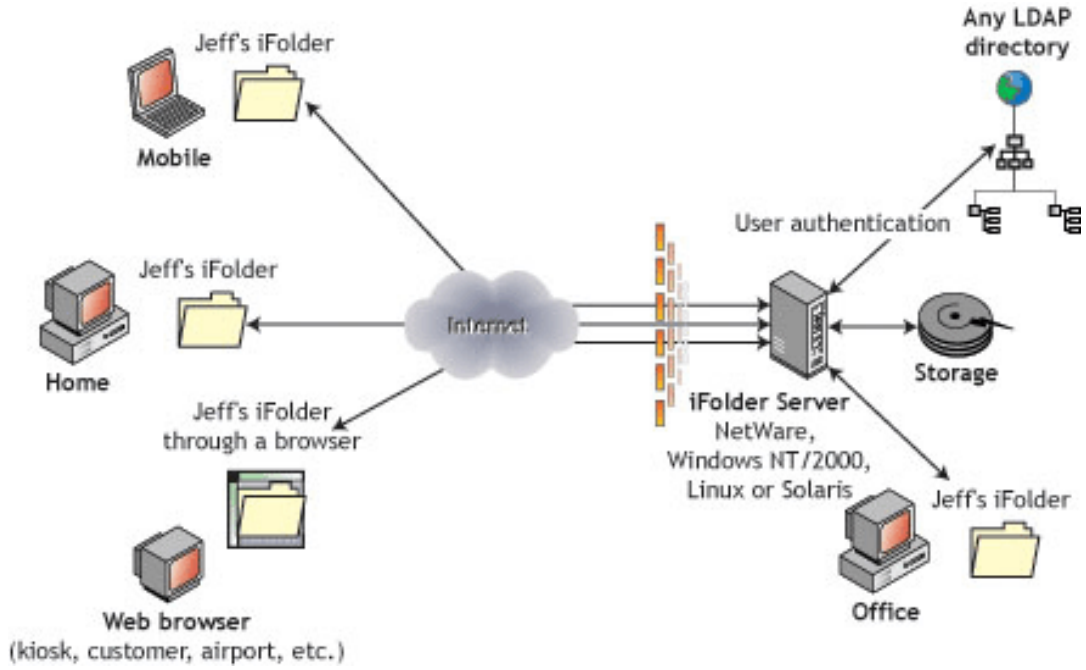
Simple Data and Account Management

Novell iFolder was designed to allow for easy setup and management by IT professionals. The iFolder server can be managed from any location using a standard Web browser. It also does not require the IT Department staff to perform routine maintenance tasks with its automatic file updates, synchronization, and encryption. Also, since local files are automatically updated to the network, iFolder ensures that data is protected on both corporate and individual levels.

No Training Requirements

IT personnel no longer have to condition or train users to perform any special tasks to ensure the consistency of data stored on their laptops and on the network. With Novell iFolder, users simply store their files in their local iFolder directory on their PCs. Their files will be automatically updated to the iFolder server and any other workstations that they use. iFolder works seamlessly behind the scenes so users don't even need to know it's there.

IFOLDER TECHNOLOGY (FIGURE 1)



How to Install IFolder

1. From a browser, go to the iFolder Server URL
2. Click on download iFolder client (IFOLDERCLIENT.EXE) and click OK.
3. Select the location where to download the file.
4. Go to the location where you saved the file to continue the installation.
5. Click NEXT for the Language.
6. Click on X sign to close the license agreement.
7. Click YES to accept the license agreement.
8. Click Finish to complete the installation.
9. Reboot the computer if asked to.

Logging in to Ifolder

1. Click Continue after reading the short introductory message to iFolder.
2. Enter your network User ID and password.
3. Click the Login button.
4. Click OK to place a shortcut to your personal iFolder files on your desktop. When you install the iFolder client, a personal folder is created for you on the hard drive of your computer and the iFolder server. By default, this personal folder is installed in My Documents\iFolder\userid\Home.
5. Enter your pass phrase and confirm it if you want the information encrypted.

NOTE: If you checked the box next to Automatic Login when you logged in to the iFolder client, you can disable it by right-clicking the iFolder system tray icon and then clicking Logout.

Accessing Your Files Over the Web

From time to time you may need to access only one file from iFolder while you are away on vacation, seminar or visiting. This tool meets this need.

1. Open a browser and go to the URL of your iFolder server URL
2. Click Login
3. Click OK to accept the Security Alert
4. Click YES to accept content from Novell (this will be installed only once)
5. Enter your username, password, and pass phrase (if you have one), and then click Connect.

Once you are logged in, you will see your personal iFolder files. They appear in a directory structure. To expand the folder and view the files, double-click the Home folder.

From the browser you can download and upload files to the server or delete, create, and rename them. Only the changes are then uploaded to the iFolder server and synchronized out to all the other computers where you have the iFolder client installed.

Log-in and Log-out

To log in, right-click the iFolder icon in your system tray and then click Login. To logout, right-click the iFolder icon and then click Logout.

Deleting Files

If you delete files from one computer in iFolder, the files in all computers where you have iFolder installed will be deleted. When deleting files, make sure that you do not delete something you will later need.

The Conflict Bin

The Conflict Bin Viewer displays a list of files that were saved before they were deleted or overwritten during synchronization with the server. You can restore any of the listed files or permanently delete them from your computer.

Conclusion

The implementation of iFolder at Philadelphia Biblical University has met a great need for the faculty, staff and students. The users have benefited in the aspect that they now can install the iFolder Client on as many Windows client machines as they like. They can use the same network login name and password to login to iFolder . All information is secure and encrypted during the synchronization. Now the faculty do not have to worry about disks and different versions of the same file or corrupted documents.

Additionally, the IT staff can now focus on improving other information services, rather than dealing with frustrated users who cannot recover lost or damaged files from floppy disks or from personal email accounts.

References

Novell Inc., Website http://www.novell.com/documentation/lg/ifolder20/index.html, April 21, 2003. iFolder Professional Edition 2.0 Documentation.

Trademarks:

Linux – The OTHER Operating System

Christopher Eric Kidd
Assistant Professor
Business and Professional Programs Division
Prestonsburg Community College
One Bert Combs Drive
Prestonsburg, KY 41653
chris.kidd@kctcs.edu

Abstract

More and more people today are hearing of this thing called Linux but may or may not know what it is, what it does, or can do. What is Linux? What can I do with Linux? Is it a program I can download for free? Or do I have to pay for it? Is it easy to install? Does it work with Microsoft Windows? Can I run my existing program on Linux? Will it work with my computer? These are just some of the many questions I have heard asked over the years from people who are computer experts and beginners alike.

My goal for this session is to provide as much information about Linux as possible by demonstrating what it can and cannot do. So if you ever wanted to learn about Linux and see for yourself what it is capable of, this session is for you.

Introduction

Linux is the result of one graduate student's idea and the work of many hundreds of thousands of volunteers from the open-source community. Linux was born in 1991 when Linus Torvalds started work on a project to develop a free operating system to run on an Intel x86 family processor. Almost 12 years later, many schools and businesses use it to run web, e-mail and database servers. Some (but to a smaller degree) also use Linux for their desktop operating system rather than using one of the versions of Microsoft Windows or Mac OS. For a more detailed outline of the history of Linux and some of the achievements made so far, please visit http://ragib.hypermart.net/linux/#In%20The%20Beginning..

Linux Basics

First, what makes Linux "Linux" is a single component called the kernel. All operating systems have one and it is the core of the operating system from which all other features are added onto. Over the past decade, many "flavors" of Linux have been developed. The word flavor is used because like ice cream, the core components/ingredients are the same. What makes each one different is the setup/management utilities and software packages that are included with it. So as a person tries the different flavors of Linux, they will find they prefer one better than another, similar to a person liking chocolate ice cream more so than strawberry. Unfortunately this is a real problem for someone new to Linux and has resulted in potential Linux users not adopting it because they chose to try a flavor they did not like. For example, I like to use Slackware when building a server but use Mandrake for desktop systems. Slackware can be used as a desktop operating system just as Mandrake could be used as a server. Here my personal preference of the

software and utilities included affect my decision when I install a version of Linux for a certain use. For list of different flavors of Linux, review the links in the lower portion of Appendix A.

Where can I get it and what does it cost?

So once you have decided which flavor to try, you need to get the software. There are several ways of getting Linux:

- download it from the Internet, (no cost expect for Internet access)
- get a copy from a friend/co-worker, (cost of one of more blank CDs)
- purchase a copy a CD for about $10.00 (with shipping/handling)

There are some versions/flavors of Linux that have a much higher cost. These have been developed by a commercial company and included non open-source/non-free software. These companies use Linux kernel and build their own components to be sold as a package.

Will Linux work on my computer?

It first depends on what you want to do with Linux and what kind of processor your computer has. The first Linux system I setup (1994) had an Intel 80386 SX 16Mhz processor, 4 Mbytes of RAM, and a 120 Mbyte hard drive. There were computers with faster processors, more RAM, and bigger hard drives at that time BUT I was limited to equipment that was not being used at the time. The system was able to provide meet the needs of the computer it had replaced (an AT&T 3B2 400) and was the first web server on that campus.

The primary factor is: Will it be a desktop or a server or both? A desktop system will require more hard drive space and a fairly up-to-date video card to yield an experience equivalent to Microsoft Windows or Mac OS. Today, a computer with 128Mbytes of RAM, 2 Gbyte hard drive, and a processor that isn't more than 2-3 years old will be a good desktop system. A server with the same CPU and memory will do most tasks presented. The amount of hard drive space needed for a server depends on the use of the server. A server that will be used as a router will work fine with hard drive of less than 1 Gbyte whereas a server that will be used as a web, email or database server may need more space.

Installation:

Depending upon the flavor of Linux used, the installation can be just as easy as Windows 98. There are some flavors that have a less than friendly environment for the setup that end up as a wonderful desktop. I believe Mandrake is the easiest, more user-friendly flavor to install. I recommend it for anyone who a) is new to Linux or b) wants to build a Linux based desktop system. It is best to review the website and any web posting concerning the flavor you decide to install. A little time reading upfront can save many hours of frustration later.

What can I do with Linux?

Below is a list of things I am able to do with Linux and the associated software that comes bundled with Mandrake (and other flavors).

- Read e-mail
- Surf the web
- Create document using a word processor
- Create documents (gradebook) using a spreadsheet)
- Develop java-based applications
- Develop web pages
- Chat with friends and colleagues via an Instant messenger
- Listen to CDs and MP3s

So from the list you can see that most common uses/tasks can be accomplished with Linux. You might ask, "Does it work with Microsoft Windows?" and my answer is yes and no. You can share/exchange files between Linux and Microsoft Windows. You can also share printers. Linux is able to view the contents of hard drives and other disks configured by and for Microsoft Windows but Windows is not able to view hard drives and other disks configure for Linux.

Again, my goal of this session is to use a live demonstration of Linux to show what Linux can do (for free), what it cannot do, and answer any questions that may arise relating to it's use and capabilities.

Appendix A

Linux Web Sites

http://www.linuxquestions.org - A great web site for people new to Linux

http://www.desktoplinux.com - News articles and HOWTO articles.

http://www.thelinuxproject.com - Basic information about Linux

http://www.linuxmall.com - Good site to get purchase any flavor of Linux really cheap

Some Flavor/Distribution Specific Sites

http://www.mandrakelinux.com

http://www.slackware.com

http://www.debian.org

http://www.redhat.com

http://www.suse.com

Apache - The OTHER Web Server

Christopher Eric Kidd
Assistant Professor
Business and Professional Programs Division
Prestonsburg Community College
One Bert Combs Drive
Prestonsburg, KY 41653
chris.kidd@kctcs.edu

Abstract

This is one of several sessions outlining the use of open-source software. This session will provide an introduction and demonstration of the Apache Web Server software. The intent of this session is to increase the awareness of this software product by providing examples and detailed information relating to its use. Topics to be covered include: computer hardware requirements, various operating systems compatibility, software installation, ease of use, functionality, expandability, and specific comparisons to other current professional products. The installation and demonstration of the software will be provided.

Introduction

The Apache Software Foundation is the home of the Apache Web Server project, which is only one of several open-source projects. The web server projected started in 1995 as the result of several web masters working together to make changes to the public domain HTTP daemon developed by Rob McCool at the National Center for Supercomputing Applications, University of Illinois, Urbana-Champaign. (http://httpd.apache.org/ABOUT_APACHE.html) And eight years later, the Apache Web server is used by thousands of schools and businesses to host their web site, competing with Microsoft's IIS (Internet Information Server) for the number one web server product on the Internet. And as stated on the main page of the Apache web server project page, "The August 2002 Netcraft Web Server Survey found that 63% of the web sites on the Internet are using Apache, thus making it more widely used than all other web servers combined." (http://httpd.apache.org)

I begin using Apache in 1997 when I built a web server for internal use for a company as a no/low cost way of disseminating information. The software came bundled with Slackware Linux, the operating system I chose for the server, and was installed with the rest of the operating system. Since that time I have, downloaded the software and installed it with various different configurations/modules depending upon what was planned for the web site.

So what do I need to run Apache?

If you are running Linux, you may already have it installed and don't even know it. Also, anyone who has a Mac with OS X also has Apache already installed
(http://www.apple.com/creative/webpro/technology/amp/index.html)

Basically if you have a computer with the following operating systems you can install and run Apache:

- Microsoft Windows 95/98/ME/NT/2000/XP
- Netware version 5.0 and and higher,
- IBM OS/2,
- Linux,
- and most UNIX.

If you are planning to build/buy a computer, as long as you plan to use one of the above operating systems it will work. I prefer to install Apache on a system running Linux, but would not think twice about installing it on computer running the Microsoft Windows, Novell Netware, or Mac operating system.

Is it easy to install?

The process of installing the software is straightforward and can be easy to do thanks to the included instructions (readme file).

* If you plan to setup a new Linux system Apache can be installed along with Linux and requires no effort other than selecting it from a list of software packages to install.

* If you have an existing Linux system, first check to see if Apache is installed. If not, then you will need to install it yourself. NOTE: This can be the hardest part of installing Apache, depending upon your experience with Linux.

1. Download it from http://www.apache.org
2. You will now have to uncompress(unzip) the file,
3. Then un-tar the uncompressed file,
4. Then compile the software (please read the included readme file for details)
5. Then do the actual installation using MAKE.

* If you plan to buy a new Mac with OS X or use a Mac with OS X already installed, you have no installing to do since it comes as part of the operating system.

* If you plan on using a new or existing Microsoft Windows system, you will need to:

1. Download it from http://www.apache.org
2. You will now have to uncompress(unzip) the file,
3. Run the setup program to install Apache onto the system.

It is installed, now what?

At this point Apache is installed and ready to run with default settings. Based on how you want Apache to work for you, you may or may not to make changes to the configuration file. If you do, the file you will need to edit is httpd.conf. Editing this file is not too difficult because the developers have included comments throughout the document, telling you what/how to change a setting to best meet your needs. From this file you can configure Apache to host one web site or

dozens upon dozens of sites. It is also this file where you can setup your server to communicate with web browsers securely (provided you have SSL configured already).

Time to upload your website and let the world take a look.

Once you have made any necessary changes to the configuration file you are ready to post your web site for the world to see. Depending upon how and who installed Apache, you will put your web content in one of two locations:

…./apache/htdocs or
/var/www

on a Linux system. The first location is the default setup if you download, compile and install Apache yourself. Also, this can be the default setup depending upon the Linux distribution you use. The latter is a more common location found in newer distributions. All you have to do is upload your documents to this directory, make any necessary file permission changes, and your site is viewable to the world.

The session

I will install and configure Apache for both Linux and Windows during the session to demonstrate the ease of install and easy of use of this product. I will also demonstrate various configurations as time permits. I fully believe live demonstrations of software is the best way to get a good understanding of how to use it and I plan for this session to be a good way for anyone wanting to learn more about how install and use Apache.

References

http://httpd.apache.org/ABOUT_APACHE.html, © 1999-2002, The Apache Software Foundation, 6 April 2003.

http://httpd.apache.org, © 1999-2002, The Apache Software Foundation, 6 April 2003.

"AMP now available on Max OS X", © 2003,
<http://www.apple.com/creative/webpro/technology/amp/index.html> 4 April 2003

Prestonsburg Community College has a new web tool – Year 2

Christopher Eric Kidd
Assistant Professor
Business and Professional Programs Division
Prestonsburg Community College
One Bert Combs Drive
Prestonsburg, KY 41653
chris.kidd@kctcs.edu

Abstract

Like many colleges and universities, Prestonsburg Community College is trying to infuse new technology to provide employees and students with information in a way that is both easy and safe to use. Last year a new web portal was created to allow faculty to place course information on the web site with minimal effort and training. Even though Prestonsburg Community College faculty have the opportunity to use a more robust course management system, WebCT, to post course information; this portal was designed to have a much easier learning curve so that faculty with little or no experience with web technology could put course information online. This presentation will give a brief history of the project but will focus on the project's success and the role of open source software in its development and maintenance.

Introduction/Background

Prestonsburg Community College is one of 23 schools part of Kentucky's Community and Technical College System. As a member of this system schools are provided with many information technology services such as high-speed connections to the Internet, centralized applications and databases, and web services. Each school in the system can benefit from using these technological provisions by not needing to invest in the equipment, software, and/or personnel. Unfortunately, some flexibility is lost in this arrangement. In such cases, each school must find a solution to their problem. In the case of Prestonsburg Community College, our website was not able to be as interactive and functional as we liked because of restrictions the system web server had.

Our solution was to build and maintain a local web server that would allow us to develop a more interactive and responsive web site. The exact cost of setting up the server is a bit difficult to pinpoint because of my previous experience level with setting up web servers. Appendix A lists the cost and details of the hardware and software used, which totaled just under $3,200. I could have purchased/built a similar system for less but I was advised to build a system that would last five years due to unknown budgetary changes. As such, I purchased duplicates of some components in case of hardware failure and enough hard drives to provide enough space to meet projected needs.

With the local web server up and running in the fall of 2001 I was asked by the Academic Dean to provide a way for faculty to post their syllabi on the web site. And in January when the 2002 spring started, faculty was not only able to post their syllabi, but also a course outline, assignments, and simple message to the web site. This was accomplished by developing an easy to use

interface based on Perl scripts and comma delimited data files delivered securely using SSL and SSH technology.

Status of the Project

After 15 months, eleven of our full-time faculty members are currently using the portal to provide various levels of course information, ranging from as little as their syllabi to those who post assignments, assignments solutions, exam reviews, and more. Even though not all faculty are posting their syllabi online, I feel the portal has been successful thus far. Several faculty who have used the web portal are now comfortable using web and related technology to where they have moved onto using WebCT to web enhance their courses with confidence. Others are happy with the current abilities of the web portal and have chosen to remain using it rather than using WebCT. Some faculty who use WebCT cross-link/dual post information on both web services/portals so if one system is temporarily down students are still able to get to the information fairly easily. With the ultimate goal of providing information to students via the web to enhance their learning experience, I again believe the local web portal has been successful thus far.

I am pleased to recently discover that several faculty members are considering the use of the web portal in the 2003 fall semester for the first time after talking with existing faculty who have or currently use it.

I emailed a questionnaire to get feedback on what they feel are the good and bad points of the web portal and to offer suggestions to improve it. The responses were all favorable and very supportive and felt the portal meet their needs as is.

At the beginning of the current semester (spring 2003), the ability to post more than just syllabi, course outlines, assignments, and messages was implemented. Previously, faculty members would indicate the file they wish to post from their local computer and indicate what kind of file (syllabus, outline, assignment or message) it should be on the server and the server handled the naming and location of the file for them. Now, faculty can upload/post other files, such as PowerPoint presentations and Access databases, into a documents section for a course allowing them to be more creative and flexible in how they provide information to their students.

Future Capabilities

For the faculty component of the web portal, the first new feature will provide a way to remove information from the site once it is post. Currently, once information is uploaded, the only way to remove the information is to post an empty document to replace the existing one. This is the result of how the portal was first designed and has not been addressed since the site has been updated. Another idea I will be looking at the feasibility of is adding a way for students to communicate with other students and the instructor via the website. This could be in the form of a threaded discussion board that only students in the class can access OR an online chat environment similar to instant messengers but would leave a history for all to review. Lastly, another idea would be to provide an online grade-book. This may not come to fruition because of student confidentiality and the nature of how the web portal currently works; where anyone can view data post on the site.

Currently, I am working with our Human Resources department to develop an online employee directory that will be managed by the HR staff. Once the necessary scripts are completed the HR staff will be able to add/edit/remove employees and their information via a web interface. The data will be used to provide a simple, straightforward campus directory but will also be used to provide more information about staff and particularly faculty. From the directory a visit to the web site could click on my name and have a web page generated that would list information about myself, such as: my educational background, areas of teaching, and specific courses I teach with links those courses. Also, web visitors could also request an Excel format document of the basic campus directory.

The role of open source software

All the software used to develop and maintain this web portal is open source. Even though commercial software could have been used, I choose to use open source for the following reasons:

* cost savings,
* availability of technical support,
* availability of learning resources,
* and familiarity with the software.

The use of open source software saved Prestonsburg Community College several hundred dollars during the initial setup. A portion of the money was saved by not having to purchase any software with the other portion saved by not having to purchase books or attend training to use the software. By choosing to use a Linux distribution, I was able to get the operating system, web server software, development tools/languages, and basic security software from a single source at no cost. And because I have used Linux since 1994, I felt more comfortable using it instead of Microsoft Windows NT or 2000; which meant I would not need any training prior to setting the system.

The same is true of the Apache web server software as compared to Microsoft's IIS (Internet Information Server). I have used Apache as a web server solution since 1997 and again by choosing this product there was no need for training. Also, unlike Apache, Microsoft's IIS product will only run on system whose operating system is Microsoft Windows NT/2000. Once nice feature about the Apache project is there are versions of the software for different operating system; so even if I had chosen to use a Microsoft operating system I could have used it. For those folks who plan or have already use Apple's new operating system OS X; Apache comes bundled with the operating system, like Linux.
(http://www.apple.com/creative/webpro/technology/amp/index.html)

To provide a secure web interface I used the SSL module for Apache; which allows data being sent to/from the web server to be encrypted so if someone were to eaves-drop and view the information being transmitted, they would not be able to view it without extensive effort. I chose a fairly high security level requirement for the web browser software on the client/user end; similar to what you would find by online banking and merchandising web portals.

To properly setup a site with encryption, several files have to be created to provide verification between the web server and web browser client. These are known as security certifications or keys. Appendix B has the necessary steps to create these keys using openSSL.

Because all the software is open-source, when I needed help with a particular aspect of setting up the software, I was able to get a wealth of information from both the people who developed it and many thousands of users from around the world. Open-source projects foster a community environment of sharing ideas and providing help to those who need to it. This is not like many commercial product developers/vendors who charge a subscription fee to gain needed information about a product. And because the software is free to obtain and distribute, entities do not have to worry about breeching any software license. This makes the life of school technology staff easy during a time when businesses and schools are under going inspections from software companies to ensure their licenses are not being adhered to. Thus resulting in many Information Technology departments having to (re)inventory all software installed and being used on college owned equipment, plus having to impose restrictive computer use policies to ensure all software is legal.

References

"AMP now available on Max OS X", © 2003,
<http://www.apple.com/creative/webpro/technology/amp/index.html> 4 April 2003

Appendix A

Hardware

Two	Asus motherboard	$349.98
Two	AMD Athalon 1.2Ghz Processors	$371.98
Two	128 Mbyte DDR Memory Modules	$199.98
One	ATI VideoWonder AGP Video Card	$059.00
One	Asus DVD-ROM Drive	$067.99
One	Teac Floppy Drive	$014.00
One	3Com 905C Network Card	$055.00
Five	Maxtor 40Gig 7200rpm IDE Hard Drive	$710.00
Five	IDE Hard Drive Removable Enclosure	$215.00
One	Maxtor ATA/100 PCI Controller Card	$049.99
One	Internal Iomega 250Mbyte Zip Drive	$139.00
One	Adaptec SCSI Controller	$099.99
One	Seagate TR5 SCSI Tape Drive	$299.00
One	HP 9600 External CD-RW Drive	$309.99
One	Server Class Case	$233.99
==========	==========	==========
	with shipping	$3,182.85

Software		
Server Operating System:	Slackware Linux 7.2	$0.00
Web Server Software:	Apache 1.3.20	$0.00
Perl:	Version 5.6	$0.00
OpenSSL:	Version 0.9e	$0.00
==========	==========	==========
		$0.00

Appendix B

Step 1 - Create a private key
openssl genrsa -des3 -out filename.key 1024

Step 2 - Remove the passphrase/word
openssl rsa -in filename.key -out newfilename.key

Step 3 - Create a Self Signing Request
openssl req -new -key filename.key -out filename.csr

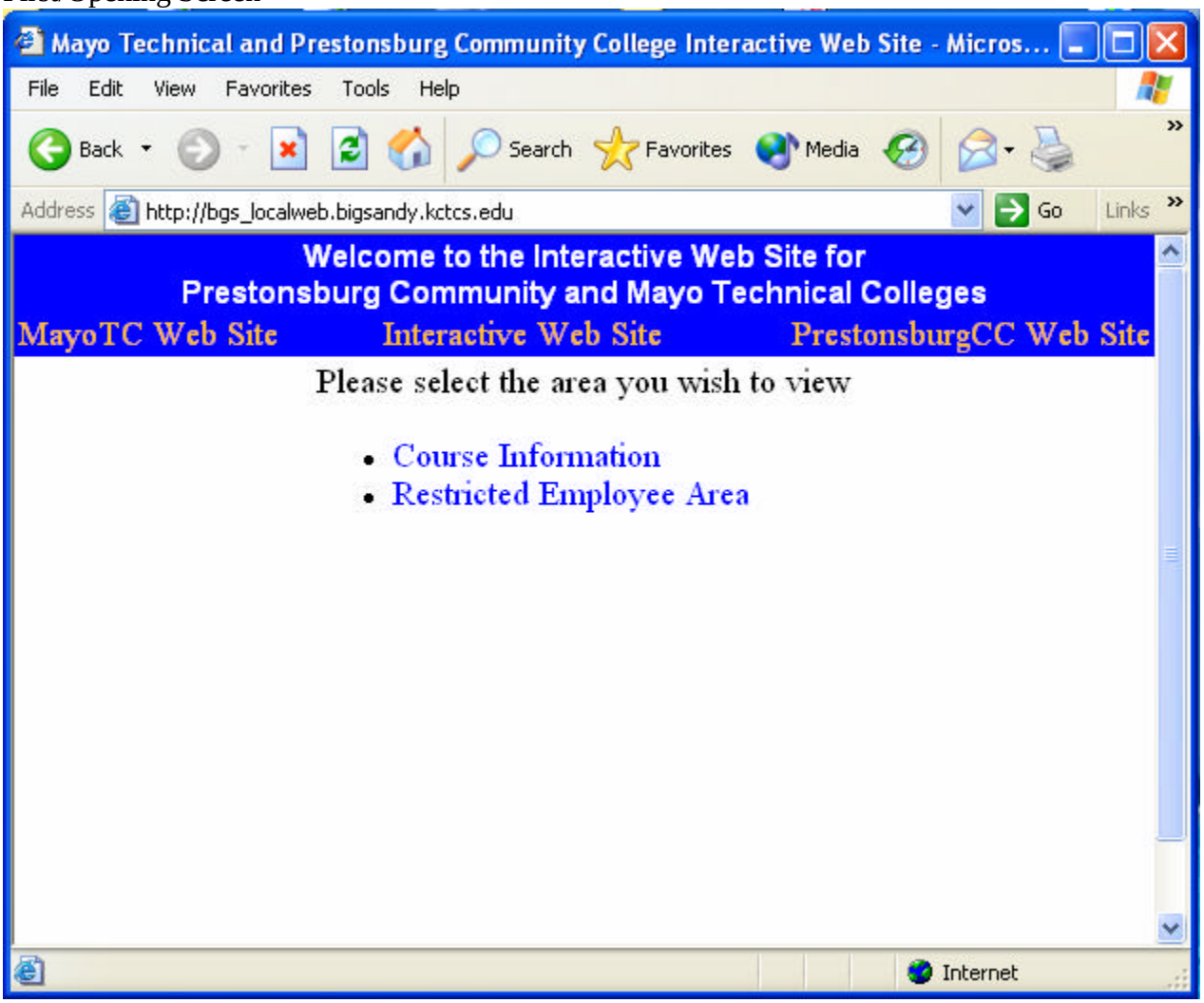
Step 4 - Create a Self Signed Certificate
openssl req -new -key filename.key -x509 -out filename.crt

Step 5 - Web server config
* Move the files created by steps 1-4 to the conf directory within the Apache directory if that is not where they were created.
* Edit the httpd.conf file so as use the new files instead of the defaults listed.
* (Re)start the Apache server with SSL support turned on

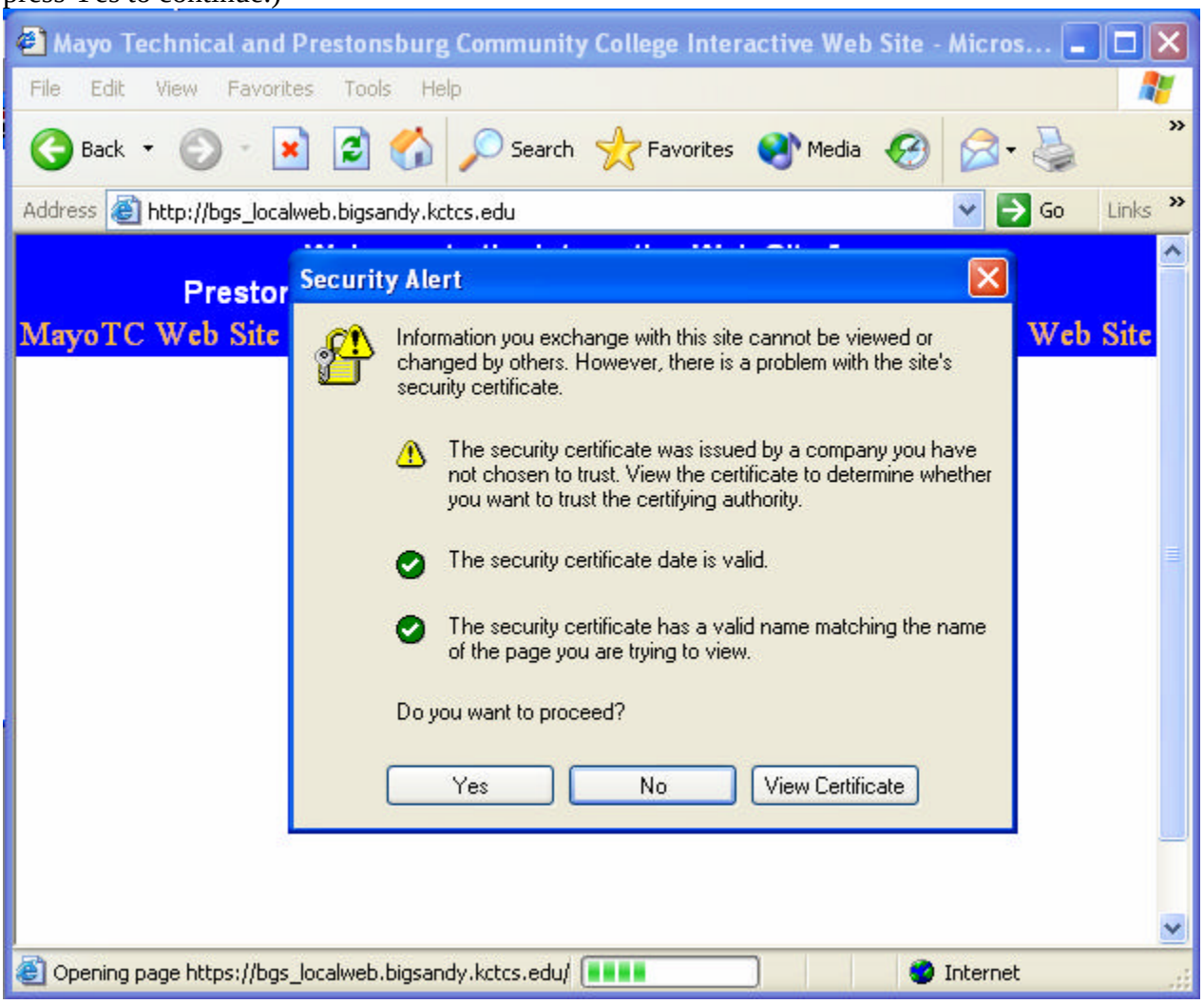
Appendix C

Here you will find screen shots of the web portal from the first screen through the login process to where an individual is presented screens relating to the function/action they wish to do.

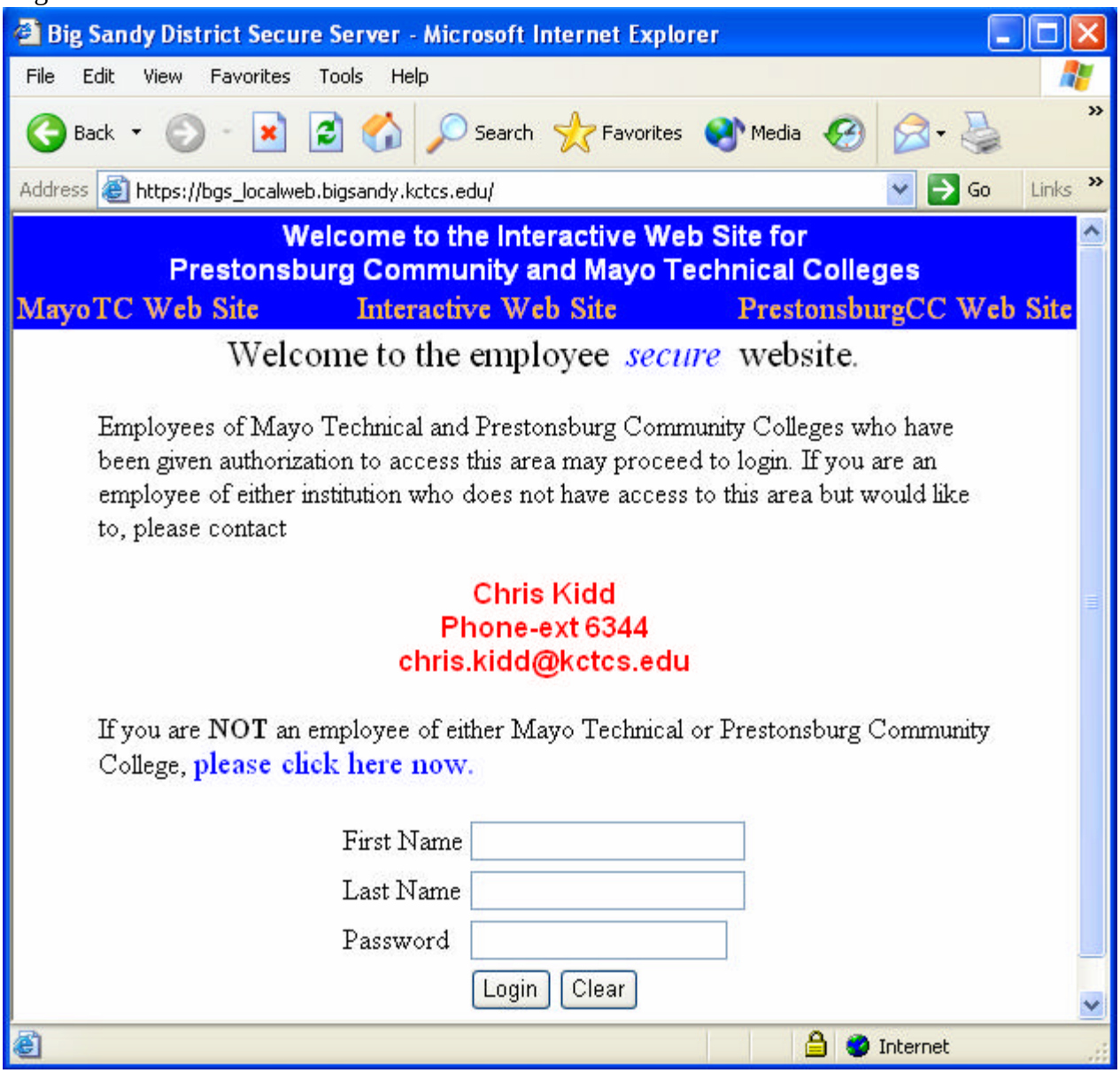
First/Opening Screen



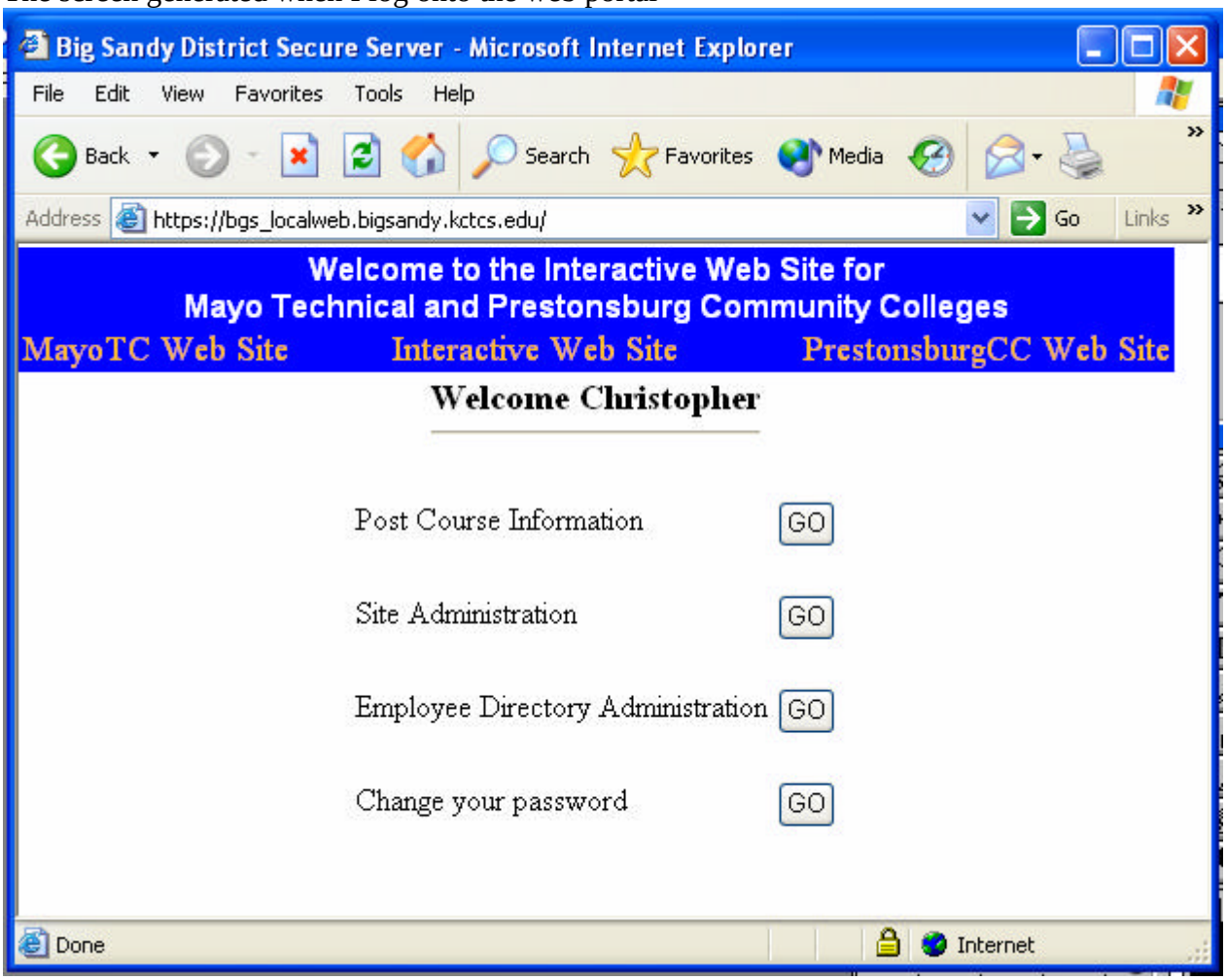
The Web Browser will display a warning about the authenticity of the SSL certificate. (Here, just press Yes to continue.)



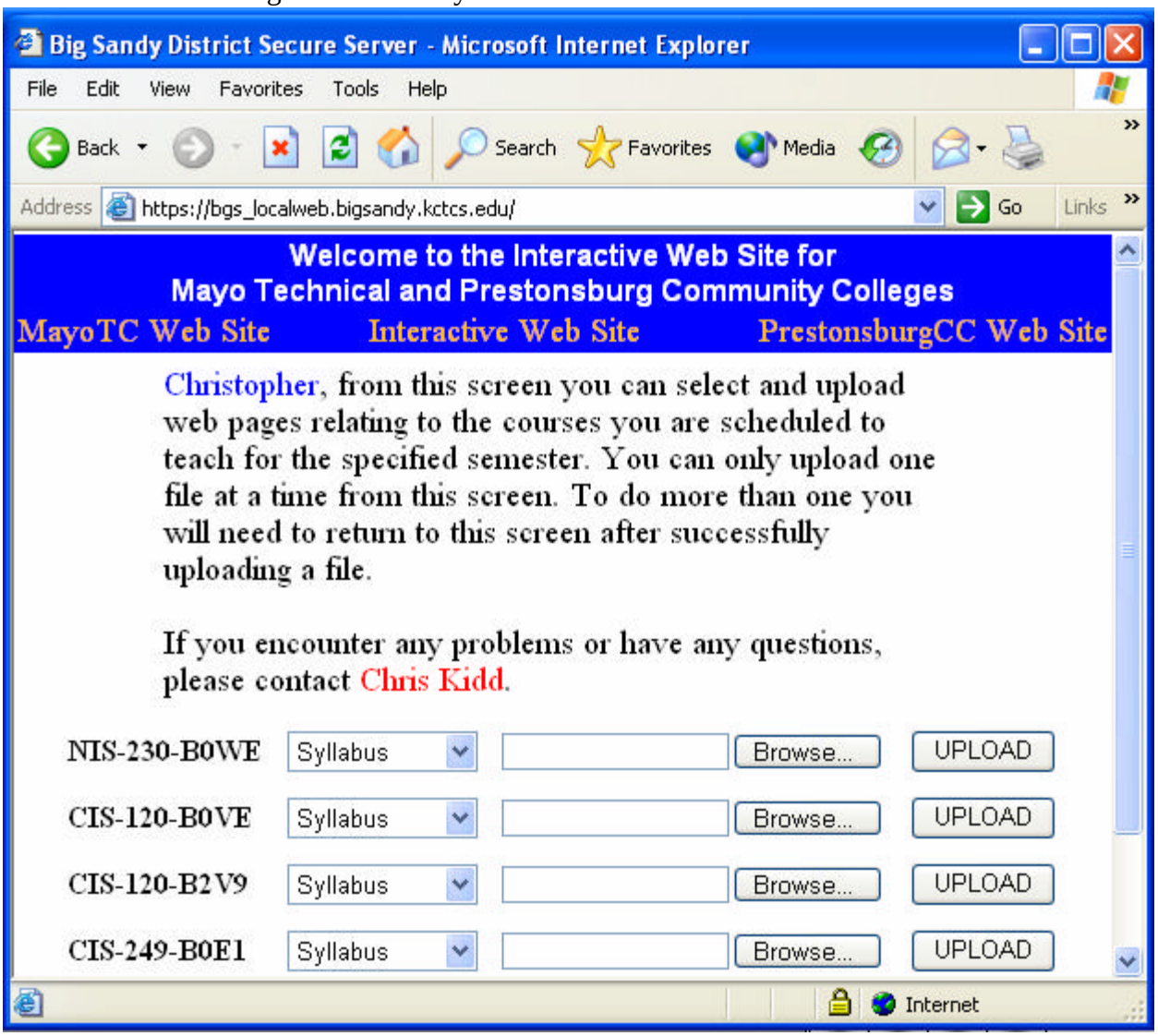
Login Screen



The screen generated when I log onto the web portal



The course list screen generated for myself



Using Intelligent Agents with Instant Messaging

Steve Knode
Marymount University
Arlington, VA 22207
703 284-5944
steve@botknowledge.com
J-D Knode
Towson University
8000 York Road
Towson, MD 21252
410-675-6426
jdknode@botknowledge.com

Abstract

Intelligent Agent technology has progressed to the point where serious, easy-to-use, and value-added applications are now emerging. Likewise, the growth of instant messaging technology to allow immediate feedback, conversations, and instant collaboration has occurred. Now, the opportunity exists to combine the two approaches to offer real-time, inexpensive, readily available "expertise" at any time through virtual instant messaging personas.

This presentation will discuss and demonstrate the use of intelligent agent technology and instant messaging to provide administrative and content information to students, virtually anywhere and anytime for minimal cost. Several different delivery methods (e.g., World Wide Web, PDA, wireless, etc.) will be demonstrated and discussed. Included in the demonstration will be an actual application developed for a university to provide such information. In addition, the potential impact of this approach will be discussed.

Using Intelligent Agents with Instant Messaging

ASCUE 2003

www.botknowledge.com

J-D Knode
Steve Knode

Agenda

- Background/Problem
- Potential Solution
- Example Applications
- Future developments

Background/Problem

the situation

More information available/needed

- 500 billion webpages including "invisible web"
- administrative info delivery time-consuming

More distance education involvement

- provide 24/7 answers
- instructor "assistant" needed

Information "Float" Disappearing

- time to digest/incorporate info reduced
- user/student expectations rising

Potential Solution

Avatars - one part of the solution

- Avatars can provide some assistance
  - Capture, keep attention
  - Provide necessary content/information
- First generation now in use
  - Scripted to provide information
  - Pull data from databases
  - Some interaction with users
- Second generation to be more powerful
  - "learn" from users

Potential Solution
Instant Messaging - one part of the solution

- Instant Messaging (IM) advantages
  - Free, easy-to-use, instant gratification
  - Provides immediate delivery of content/interaction
  - Popular (100 million users, >3 Billion messages per day)
- Three competing standards
  - AOL Instant Messaging (AIM)
  - Yahoo Instant Messaging
  - MSN Messaging
- Instant Messaging disadvantages
  - Security weaknesses
  - Partner availability
  - No permanent record of conversations

Potential Applications
Intelligent Agents with IM

- Directly Assist Students/Users
  - Provide specific answers to questions
  - Provide administrative assistance
  - Interact and "chat" with users
  - Tutor on specific, narrow domains
- Provide Indirect Assistance
  - Link to webpages, other information sources
  - Open executables when asked
  - Pull information from dynamic databases
  - Capture Interactions for further improvement

Example Applications

- Generic, broad example
  - Well-developed
  - Broad knowledge on several general topics
- Administrative Assistant Example
  - Specific for one University
  - Designed to assist in recruiting and retention
  - Provide "cache" effect
- Content specific examples
  - Depth on a very narrow content
  - Narrow focus assists in development

Future Developments

- Greater intelligence in Avatars
  - More conversational in nature
  - Remember/recall information
- Easier to develop
  - Scripting made easier
  - More end-user developed
  - Reduced cost to administer and maintain
- More anthropomorphic features
  - Better graphics/more natural interaction
- More collaboration with other agents

Sustaining Technology In a Discovery Learning Community

Tricia M. Kress
Leonard Ciaccio
The Discovery Institute
The College of Staten Island
City University of New York
http://discovery.csi.cuny.edu
triciakress@hotmail.com
718-966-1129

Introduction

Difficulty integrating technology into classrooms is a well-known challenge. As early as the 1920's, radio and film were predicted to be innovations that would change the classroom. In the 1950's, it was television, in the '60s and 70's teaching machines, and from the '80's to the present, computers. Generally, the teachers who embrace technology are the rare minority, and those who don't are blamed for the break-down in implementation because they are regarded as showing, "indifference, lethargy, even antagonism, toward this revolutionary means of communication" (Tyack & Cuban 123). But the truth of the matter is "in the top-down process of advocating and implementing technology, teachers [are] rarely consulted, though it [is] mainly their job to make it work in the classroom" (Tyack & Cuban 121). Currently, with the near universal availability of the personal computer, it is hard to understand why many teachers still do not use computers in their classrooms. If the machines are installed in their rooms and the teachers receive training, how is it that computers often go unused other than to reward children for finishing schoolwork early or for good behavior?

While working with the teachers employed at The Discovery Institute, I have begun examining how and why some teachers use technology with their students while others don't, and have found that educating teachers rather than training teachers to use technology and providing the support of a community of learners seems to play a significant factor in whether a teacher will or will not use technology to enhance her or his classroom. Through further interviews and focus group observation, I expect to find that teachers who merely receive training outside a discovery learning experience and without the professional and emotional support of a community of learners will be less likely to effectively use technology in their classrooms.

Training vs. Education

To explain this problem, I will first examine the difference between training and education. Even if a teacher is given a traditional training course on how to use a computer, and even if that teacher claims the experience was helpful and enjoyable, this may not result in using technology in the classroom. "[T]raining involves the honing of a person's mind so that his or her mind can be used for the purposes of someone other than that person. Training thus typically entails a radical divorce between knowledge and the self. Here knowledge is usually defined as a set of skills or a body of information designed to be put to use, to become operational, only in a context determined by someone other than the trained person" (Noble 2). Because of this, while teacher training might stem from good intentions, its results are often unproductive. Training a teacher

to perform specific tasks on a computer tends to confine rather than empower the teacher when (s)he tries to use the computer for purposes other than those (s)he has been trained to do. In this case, the teacher has no scope of how to apply these skills outside of the lesson completed during training.

In order for these skills to be more generally applicable, the teacher must be educated, not trained how to use them. A teacher must learn to use these skills within a context of solving a problem or completing a task of their design in order to remove the skills from the abstract and place them in the realm of their experience.

> "When the subject matter is psychologized, that is, viewed as an out-growth of present tendencies and activities, it is easy to locate in the present some obstacle, intellectual, practical, or ethical, which can be handled more adequately if the [skill] in question be mastered. This need supplies the motive for learning… But when material is directly supplied in the form of a lesson to be learned as a lesson, the connecting links of need and aim are conspicuous for their absence" (Dewey 25)

Learning Communities

My research (which will be discussed in more detail later) shows that teacher learners can more effectively transform their classrooms with support of other people who are essentially working toward common interests and goals. Within the learning community they are treated as professionals, capable of creating and building a knowledge base with which to enhance and transform their teaching strategies and classrooms. The community is a place where teachers' ideas can be given legitimacy, thus empowering teachers to transcend the oppressive environment that often comes along with working in a bureaucratized school system. The community itself should be comprised of teachers with different experience levels and disciplines, ranging from the English teacher with two years experience to the veteran science teacher with 30 years experience. All teachers involved in the group are full participating members of the community, where the different experience levels can create an apprentice-like situation where newer teachers can learn by doing tasks with the assistance of master teachers. And while, at first glance, this may seem to be a uni-directional information exchange, it isn't. Newer teachers will bring with them their own ideas and experiences that will vary from the old timers' ideas and experiences, thus creating a multi-directional exchange of information that will create a continuously evolving, ever-growing, self-sustaining community of learners.

When using the learning community to educate teachers to use computers, one cannot simply sit the teacher down alone and tell her or him to use the machine. For new users or resistant users, the computer can seem threatening, overwhelming, and often adversarial. There must be a zone of comfort established, and this can be achieved by having a supportive community of learners to engage with. "Rather than asking what kinds of cognitive processes and conceptual structures are involved, [we must] ask what kinds of social engagements provide the proper context for learning to take place" (Lave & Wenger 14). In the case of learning to use technology, the learning community is essential in demystifying the tool. Teachers within the community must have a sense that there is more to the computer than merely the use and significance of it. "[T]he trans-

parency of any technology always exists with respect to some purpose and is intricately tied to the cultural practice and social organization within which the technology is meant to function: It cannot be viewed as a feature of an artifact [of the community] in itself but as a process that involves specific forms of participation, in which the technology fulfills a mediating function" (Lave & Wenger 102). Teachers must see past the computer as object and understand it as a necessary part of the culture of the learning community.

> It might be useful to give a sense of this interplay by analogy to a window. A window's invisibility is what makes it a window, that is, an object through which the world outside becomes visible. The very fact, however, that so many things can be seen through it makes the window itself highly visible, that is, very salient in a room, when compared to, say, a solid wall. Invisibility of mediating technologies is necessary for allowing focus on, and thus supporting visibility of, the subject matter. Conversely, visibility of the significance of the technology is necessary for allowing its unproblematic—invisible—use. (Lave & Wenger 103)

With this type of understanding, the computer can be used for its intended purpose, that is, enhancing knowledge production, informational exchange, and curriculum development. In addition, by effectively using the technology for tasks within the community, the teacher helps to further extend her or his membership within the community of practice, and by having others in the group who can share knowledge and assist when obstacles arise while using the technology, the teacher less frequently has the fear of the machine controlling her or him rather than the other way around. Thus, the computer can be used as it is intended, as an informational "window" to the world revolving around the education within the learning community.

The Discovery Institute

In its design the Discovery Institute aims to create an environment that nurtures teacher education through the support of a learning community. In the words of its founders, The Discovery Institute began in 1987 as the Discovery "Center" when Drs. Leonard A. Ciacccio, Biology; and James W. Sanders, Teacher Education, secured a $6,000 grant to work with 4 high school teachers in redeveloping their four different academic curricula into classroom activities, using an interdisciplinary theme that would engage their students in learning more actively. They hoped that more interesting classrooms would result in more students graduating from high school adequately prepared for college.

Today, more than 50 additional grants later, this enterprise has expanded into a 4.5 million dollar annual operation. In 2001 the City University of New York officially made it an "Institute" with a mandate to disseminate programs throughout the University. The 10 full-time and 2 half-time professional staff, 8 of them retired teachers who began as participants in the Institute's programs, assisted by over 30 New York City master teachers and 50 College of Staten Island/CUNY faculty, and supported by 5 full time administrative assistants, implement the Institute's projects.

All projects are integrated into a single mission: the renewal of teaching, mostly through the professional development of in-service teachers, but more recently through the redevelopment of pre-service teacher education programs and recruitment of highly qualified new teacher prospects through a "Teaching Scholar" tutoring program. All professional development efforts stress the need for teachers to turn learning over to students through a discovery approach, to integrate disparate subjects by working together on common themes, to incorporate State learning standards into all lesson plans, to attend to basic skills development, and to relate lessons to the real world of students.

However, within the above parameters, teachers are left entirely to their own creativity to design lessons and activities to use in their classrooms. This is the Discovery Institute's fundamental philosophical principle, and the basis of its success. All professional development efforts respect teachers' professional integrity. Discovery Institute staff never dictate to teachers. They serve only as resources. Within the State-mandated curriculum, teachers create their own curricular activities, and implement these in their own way. The Institute provides no ready-made curriculum guides or materials, and discourages teachers from using such. Experience has confirmed that an imperfect lesson personally developed by the teacher has more impact on students than a perfect lesson borrowed from an "expert". Every teacher has to "reinvent the wheel." The hundreds of curriculum development workshops conducted at the Institute every year all stress this principle, which results in the Institute's signature achievement: TEACHER EMPOWERMENT.

It is because of this philosophy that the Discovery Institute expects that all teachers involved take responsibility for creating their own curriculum and taking charge of their own professional development. Everything is done through teams, or communities of teachers. There are never "professional developers" involved to tell teachers what to do. The process is implemented through a system of curriculum development teams representing each major academic subject. Teams meet weekly after school and more frequently during intensive sessions over the summer. The team members exchange ideas, discuss, critique and develop lesson plans together. Each group has a Discovery Institute "master teacher" who facilitates, but never dictates what the team is to do.

With all this in mind, the over-arching discovery learning process is the perfect environment for helping teachers to incorporate computers into their classrooms. Aside from the fact that many computer software programs make traditional rote learning more tolerable, if used properly, computers put students (and teachers) in open-ended learning situations. Computerized classrooms also force radical changes away from the traditional teaching/learning relationship: from lecturing to coaching, from whole group to individualized instruction, from silent to interactive classrooms, from all students learning the same things to different students learning different things.

Learning Communities as Technical Support

As beneficial as all this is, and as enthusiastic as teachers might be about making these types of transformations in their classrooms, there is an element of resistance that is involved in this too. Resistance is "a word for the fear, dislike, hesitance most people have about turning their entire lives upside down and watching everything they have ever learned disintegrate into lies. 'Em-

powerment' may be liberating, but it is also a lot of hard work and new responsibility to sort through one's life and rebuild according to one's own values and choices"(Lather 76). When suddenly a teacher has to redefine everything she or he knows about what it means to be a teacher, when their identity as teacher has suddenly shifted to not just teacher but learner, there is a perception that power or authority has been removed rather than supplied, and this is where the support of the learning community becomes so crucial. "Familiarity breeds contempt, but it also breeds something like affection. We get used to the chains we wear, and we miss them when removed" (Dewey 28). Without the support of a community with which to develop a new identity, teachers will go back to working in a way in which they are familiar—the way in which they were taught—*without* technology. While they may feel confined in their old ways, if they do not have strong support for the new ways they wish to embrace, most will inevitably revert to what they knew before their transformation. This is a critical aspect of why the implementation of technology will break down outside the learning community while being sustained within it.

Research

Over the past few months I have gotten to know many of the teachers at the Discovery Institute by joining them as they work together during round table discussions and in the computer labs. Outside the curriculum groups I conduct in depth one-on-one interviews. These interviews show that the teachers who do not use computers with their students (whether they consider themselves computer beginners or computer proficient) consistently have similar reasons for not doing so, just as the teachers who do use technology have similar reasons and ways for using computers. Usually, even though the reasons for not using computers are many, they all lead to the same thing: the teachers who do not use computers with their students, while having support at the Discovery Institute, do not have community support within their own schools. They have no colleagues who can offer a greater range of uses for the computer than they may already envision. This leads to false expectations of how the computer can be used, often causing teachers to set unreachable goals that feel overwhelming and impossible, thus the teachers abandon the idea of using computers at all.

In addition, because the task of using computers seems so immense, there is a distinct level of fear that accompanies the implementation of computer assisted learning in the classroom. Any fear teachers have of losing their status as the authority and knowledge base in the classroom is magnified by the computer because suddenly, just by its interactive nature, the computer demands that teachers become learners along side their students—unless of course the computer is being used merely to aid in traditional rote learning and test preparation. To exemplify this issue, let's consider some of the most commonly lamented problems of non-computer users, and examine some of the underlying contradictions and meanings behind the perceptions teachers may have about what it means to use computers with students.

Computer availability is one of the most common problems teachers site. Teachers often complain that there are not enough computers for students to use in the classroom. The teacher then must make special arrangements to take the class to the computer lab. Two examples of this are Nadine and Fran who work at the same school. Both claim to be computer proficient, having used computers consistently to type lessons, scan images, create charts, graphs, and complex equations for more than ten years, but neither uses computers with their students:

> Question: In what ways do you use computers with your students?
>
> Nadine: "I don't. I would be willing to do it. But there's not enough space, and there are no rooms [computer labs] available."
>
> Fran: "We don't use computers because we don't have enough of them in the science department. We have to make arrangements to bring the students to a lab, and sometimes we just don't have time in the curriculum for that."

However, another teacher, Howard, works at the same school as Fran and Nadine (in the same department as Fran) and uses computers with students easily. Responding to the previous question:

> Howard: "I do everything from simple lessons using multi-media [CD-ROM's about] circuitry to using the computer with a projector to show clips of how an earthquake behaves."

There is a contradiction here in the accessibility of computers within their school. Howard has no problem with computer availability, but Fran and Nadine do.

The problem here is not that one teacher has more computer lab privilege than the others, but rather, Howard understands that using computers with students does not necessarily mean that each student must have a computer to use. The computer is used as a tool where it isn't necessary for students to have individual machines. For Fran and Nadine, using computers means each student must have her or his own computer station. For example:

> Question: Why do you not use computers with your students?
>
> Nadine: The students have to get ready for the regents exam, and we don't have any real good regents prep on the computer. There's nothing out there that's worthwhile yet.
>
> Question: How do you think computers should be used in the classroom?
>
> Fran: As a learning tool to maybe do [solve] some genetics problems.

Both teachers indicate that the computer should be used for test preparation of some kind, and this type of work would traditionally be done by students individually. If computers were to be utilized in this way only, it would be impossible to conveniently accommodate all teachers and students in the school unless there were enough computers for all students to use. Yet, Howard understands that there is more to using the computer than just test preparation and questions. He uses it for motivational and illustration purposes with multi-media video demonstration, and this does not require that all students have their own machines. With a projector, this can be done using just one machine.

Another common problem cited is a lack of technical support within the schools. Let's take for example Jeffrey who uses technology at home and at the Discovery Institute but will not use it in school, and again Fran who we heard from before:

> Question: How accessible are computer labs in your school?
>
> Jeffrey: Computer labs are accessible, but they may not have tech support. So if I have a problem with a computer, I could go down in flames in the lesson.
>
> Question: What do you think would help you begin to use computers or continue to use computers more efficiently?
>
> Fran: Maybe if there was some software I could use, and then maybe have someone show me how to use it. Also, if they could show me what problems I might have and then how to get out of them.

Initially, it would appear that the problem here is the lack of technical support provided by the school, but underlying is this: both teachers anticipate problems with the computers before they have even begun using them in their classrooms. They consistently experiment with computers at home and around other colleagues, but while students are around they do not. To run into a problem with the computers in front of students would mean that their knowledge might be subject to scrutiny, thus demeaning their authority as teacher and knowledge conveyor. There also may be the fear of students finding information that is contrary to what the teacher is trying to teach which then challenges the credibility of the teacher.

On the other hand, Phillip, who does not consider himself computer proficient, consistently uses computers with students.

> Question: How have your views about your students changed [since coming to the Discovery Institute]?
>
> Phillip: I realized they can do more than I ever thought they could. We have this program I-movie that they can do on their laptops. I can't do it, but the kids can. It might take me three days to create something with it, but it takes them one.

Unlike Jeffrey and Fran, Phillip is not afraid of not knowing something in front of the students. The students are more computer proficient, yet this is not intimidating. Phillip understands that using the computer changes the dynamic of the traditional teacher/student dichotomy. The students may know more about the technology than he does, just as he knows more than they do about the subject matter. Together, teacher and student can explore and learn. Instead of the teacher being the knowledge conveyor, the teacher is now a coach guiding the student toward knowledge discovery and production, because while the teacher might not be a computer expert, the student needs the teacher to help decipher and critique subject matter gathered with the computer. And while the student is not an expert in the subject matter, he or she might be more adept at navigating the technology. Thus by sharing the knowledge each possesses, teacher and stu-

dent can learn from each other rather than the teacher being the center of the learning process. But this perceived disempowerment is scary, and teachers often resist it because they feel that they no longer are in charge of their lessons or even their direction and outcome. With this new teacher/student relationship also comes a great deal of uncertainty.

It is because of these things that the support of a strong learning community is so important, and it's apparent especially in the interviews with Howard and Phillip. Howard uses technology in his school even though Fran and Nadine claim it's a difficult task. Part of the reason why Howard looks at using the computer differently than they do is because he shares an office with the school technology teacher—he has someone to talk about technology with every day. Then, in Phillip's school, there is a strong emphasis on technology. Each teacher is supposed to have a website, and all the students use laptop computers. Even though Phillip has little computer experience, he is surrounded by colleagues who believe in using technology in the classroom. This gives him the constant support of his peers. Fran, Jeffrey and Nadine do not have this same support base. Of the twelve interviews I conducted (7 were non-users, 5 were users), those who used technology had consistent support of a community within their schools, and those who did not use computers did not have the support of a community within their schools. This pattern was consistent with the exception of Peter who has a strong desire to use technology with his students, but is often refused computer access, so he encourages his students to use technology on their own by giving them web addresses that correlate with all of his in class lessons. Aside from him, all of the non-users gave up on using computers with their students because it proved to be too overwhelming and unpredictable. But those who used computers, even when working under the same conditions as some of their fellow teachers, did not have any problems using the computers, and their expectations of what computers should be used for were much smaller.

Conclusion

As the research continues, this question arises: will this pattern continue? Will further interviews show that teachers without a strong community of technology users usually opt not to use technology themselves just as teachers who do not have a community of discovery teachers will opt not to use discovery method themselves? Since learning to use the computer is much of a discovery process itself, a learning community is essential for successful computer integration. Teachers do not want to give up all they have known of teaching. They do not want to disrupt their identities as teachers because that can be frightening and uncertain. However, with a strong community of learners to work with, teachers can learn to transform their classrooms to include technology just as the teachers at the Discovery Institute are learning to include discovery methods. And just as knowing the format of a discovery lesson doesn't necessarily translate into discovery learning, computer training doesn't translate into using computers in the classroom--Fran, Nadine and Jeffrey illustrated that.

Technical support is crucial when trying to use technology, but in order to integrate it into the classroom, teachers need more than what an 800 number or a Microsoft office assistant can provide. While 24 hour hotlines can help solve why your computer isn't running smoothly, and an MS office assistant can offer suggestions on the proper formatting for a letter or resume, these things cannot help a teacher see beyond their own realm of experience. Neither of those types of support can suggest that a physics teacher use the computer to demonstrate how an earthquake

works, and if there isn't someone else to suggest that, it might never occur to that teacher to do it. This often prevents teachers from evolving and growing because they can't see beyond their own horizons. Thus, they miss out on a multitude of perspectives that offer a wider spectrum of possibilities than what they already have. Without the consistent support of a community, teachers are limited to their own resources when trying to make changes in their classrooms and professional lives. But with the support of a learning community, teachers come to realize that change and growth is limitless; there are always other ways of doing things.

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A WEB-Based Practice and Testing System

Richard Kuntz
Monmouth University
W. Long Branch, NJ 07764
718-966-1129
kuntz@monmouth.edu

Abstract:

Over the past four years, the author has been developing and enhancing a web-based practice and testing system, called MUTester. The system has evolved into a "production" system that is currently supporting several courses at Monmouth University. Several new features have been added to the system since the presentation at the June 2001 ASCUE Conference. In addition to describing the new features, the presentation will focus on the distribution, setup and administration of the software package. The software will be available as a download from Monmouth University.

Monmouth University sponsors a Consortium of MUTester users. The Goal of the Consortium is to provide a no-cost alternative to commercially distributed, web-based testing and tracking software. MUTester is freely available to Consortium members as a shareware, open systems product. Subject of appropriate resources and skills, Consortium members assist in the development of problem set databases and software enhancements. A brief status report will be provided on the Consortium.

This talk/paper will demonstrate and describe the details of *MUTester* as they relate not only to supporting the Keller Plan of instruction in mathematics but also to supporting most courses in most disciplines.

Instructional Setting:

Monmouth University is a private, comprehensive, teaching university enrolling approximately 6,000 students of which 3800 are full-time undergraduate students. The University is located on a 152 acre campus in the central shore area of New Jersey – approximately 55 miles south of New York City.

The Mathematics Department has thirteen full-time faculty members. The Mathematics Majors program at the University enrolls over 70 full-time equivalent students; a significant number of those students are dual-majors – mathematics and education. As with most institutions of today, a substantial part of the teaching responsibility of the Mathematics Department is directed toward instruction for non-majors with many in the non-science disciplines. The largest single group serviced by the Department consists of those students majoring in programs within the School of Business Administration.

Like most higher educations institutions of today, the University boasts of a wired campus. At Monmouth, this includes connections to all campus buildings and to each room in the residence halls. At the present time, the University is completing a plan to wire all classrooms with video

and data and to install computer-supported video display units that are connected to the campus network. There are currently 27 computer laboratory/classrooms and 25 classrooms with permanently installed video display units.

Key Features of MUTester (described in[2]):

Several years ago, the author developed a web-based system of practice problems [1] to support several courses in mathematics. During the spring 2000 term, the system was expanded to include a testing component [2] and during the spring 2002 term the solver component [6] was added. The complete system is called *MUTester*.

MUTester contains three main components: a Practice Problem Component, a Testing Component, and a Demonstration (or Solver) Component; and two minor components: on-line attendance tracking feature, and on-line survey capabilities with comment sections. Since the system is web-based, students are able to access the components from any web-connected station, whether on campus or off.

During the 2002/2003 academic year, *MUTester* was used to support 150 students in PSI (Personal System of Instruction aka Keller Plan -- go at your own pace) instruction in remedial/college algebra mathematics and 30 students in finite/linear mathematics for business students. Many other courses used selected components of the system -- practice problems, attendance tracking, and survey administration. In addition, the system is used by the Mathematics Learning Center for mathematics placement.

At the present time, there are approximately 1800 problems supporting remedial/college algebra type courses, 900 problems supporting finite/linear mathematics for business students and 200 problems supporting a variety of other courses.

The system is capable of presenting problems/questions in *gif* format, encoded *html* text, plain *ASCII* text, or any combination. The Testing Component can be used in conjunction with a specific set of practice problems that have been made available to students, or with a separate set designed exclusively for the testing feature.

Recent additions to the system include:

1. Free format answers -- single answer, multiple answers, exact match, or evaluation format
2. Attendance tracking
3. Comment section (can be used in survey applications)
4. Instructions/hints in testing mode

As summarized in [6], the basic features of the Practice Problem and Testing Components are to:

1. Provide for web accessibility through Internet Explorer.
2. Support dynamic additions and deletions to the test-set database.

3. Support a variety of modes at the problem-presentation level.
4. Provide access to individual student progress records.
5. Support dynamic test creation from a problem set that can be assigned to a given student or to an entire class.
6. Provide an authorization mechanism for test administration.
7. Support web-based, faculty-level administration.
8. Support both multiple choice answers and free format answers -- single-answer, multiple answer, exact match, or evaluation format.

The Demonstration (MUSolver) Component [6], developed during the spring 2002, consists of a collection of computer programs that dynamically solve in an annotated, step-by-step manner, a student-entered problem. Currently, the Solver system contains solution procedures for twenty-five different mathematical concepts.

Description of the System:

Three database files and a directory structure on a web server are used to support *MUTester*. One database, the problem set database, organizes and controls access to the various problem sets; a second one, the testing database, controls the testing process and maintains student records; and the third database contains the comment information related to survey type questions. The system runs under IIS 5.0 and uses "Active Server Page" (ASP) technology to access the databases and files and to format the pages for presentation to the browser. In addition, VB and Java Script are used to control selection actions, page flow, error checking and similar actions.

The system "seamlessly" supports access to both Access tables and SQL2000 tables -- in any combination.

Unless specified otherwise, the system assumes the default settings of Access as the database server, Problemset.mdb as the problem database, MUTester.mdb as the testing database, and survey.md as the survey comment database. As described in more detail below, alternate servers and databases are set using the option

"server=yourservername:yourdatabasename."

System Component Descriptions (update of section in [4]):

Except for the databases that are located in a SQL2000 server database, all files and directories are contained within a single directory structure with root name "MUTester." That directory structure should be located on a web-server running IIS4.0 or higher. The system will function using one of the Microsoft Personal Web Servers, however that severly limits the number of connected users. The requisite directory structure is:

MUTester
/Administration
/Attendance
/DatabaseMaintenance
/Databases
/Images
/Include
/Practice
/Problems
/Testing

The ***Administration*** directory contains all the html files and code necessary to maintain the testing databases. The basic features supported by the items in this directory are:

1. Add a course section
2. Add students
3. View and add/delete to course roster
4. Exam Header Maintenance
5. Individual Student Exam Maintenance
6. Class Exam Maintenance
7. Progress Report by Class
8. Individual Student Progress Report

Access to these features is through the html form: "default.asp" located in the Administration subdirectory. The complete URL to maintain the default testing database (the Access database file: MUTester.mdb) would be:

"//yourwebservername/MUTester/Administration/"

To maintain a different testing database, it would take the form:

"//yourwebservername/MUTester/Administration/
default.asp?server=yourservername:yourdatabasename".

Appendix A contains a screen shot of this menu.

The ***Attendance*** directory contains all the files and code necessary to administer the attendance application. The actural attendance table is located in the corresponding testing database. Only the code files are in this directory, consequently, no ongoing maintenance is required for this directory.

The ***DatabaseMaintenance*** directory contains all the files and code necessary to maintain the problem set databases. The basic features supported by the items in this directory are:

1. Select a server and problem set database
2. Add, Edit and Delete information regarding a specific problem
3. Add, Edit and Delete information regarding problem classification
4. View existing classification information
5. Maintain problem ID numbers (reorgainize and resequence)

Access to these features is through the html form: "default.asp" located in the DatabaseMaintenance directory. The complete URL for the form is:

"//yourwebservername/MUTester/DataBaseMaintenance/"

The form presents dropdown boxes for selecting the various options. Appendix B contains screen shot of this menu.

The ***Databases*** directory contains all the Access databases for the system. For the system to function in the Access default mode, this directory most contain the three databases: Problemset.mdb, MUTester.mdb, and Survey.mdb. The installation set contains these three databases, a template database for each of these structures, and a sample database containing some sample data for each.

In addition to the web-based tools contained in the DatabaseMaintenance directory described above, these Access databases can be maintained directly using Access, provided there is network access to the web-directory containing the MUTester materials.

The ***Images*** directory is a repository for any images that may be used. It is not necessary that images files be placed in this directory. However, it is a location that can be easily identified. For example, this is an appropriate place to store the university logo that could be used as part of the page design. The *include* directory contains a generic header file that can be edited to individualize page headers.

The ***Include*** directory contains six critical files and several code files that support the Solver System. These files are required for proper functioning of the system. They are:

1. Blank.htm
2. connect.inc
3. error.asp
4. includeheader.asp
5. MUTester.ini
6. ipcode.inc

7. Five include files that support the solver component (fractions.inc, PolyevalRoutines.inc, PolynomialRoutines.inc, rightclink.inc, SolverRoutines.inc)

The *Blank.htm* form is called by a variety of the programs to initialize parts of a frame-set page. Nothing has to be done to the file.

The *error.asp* file is used to report some run-time errors that occur during the execution of the system. Attempts have been made to build in some error traps. A typical error that is reported through this mechanism is an attempt to link to a nonexistent server or database.

The *connect.inc* file establishes connection to the various databases. It uses DNS-less connections. The file is included in all pages that require access to a database. It functions as a subroutine where it is passed server and database information in the form: servername:databasename. Here is where the default settings are set if a null-string is passed. This file does not require any editing.

The *includeheader.asp* file contains the information that is displayed on the top part of any page presented in frame-set format. This file can be edited to match individual site setting.

The *MUTester.ini* file is a text file that contains the server database information required for the dropdown boxes in the database management section. The file contains a description of the requisite format. It should be edited when servers and databases are to be used other than the default ones.

The remaining files in this directory contain code to support the solver component routines.

Problem set Database Description:

The database for a problem set contains three tables. A small table keeps a count of the number of times the initial screen is downloaded to a client browser. That count estimates the number of times users access the system. The second table contains information on the various problem classifications for that database application. It has a field that identifies the classification by name, a field for instructions for that type of problem, and a field for a sample problem. The sample problem is optional. It is a variable length field and can contain the complete text (including html format statements) or a link to external file that will present the sample file. The instructions field is of variable length and provides instructions to the user as to the goal of a specific set of problems.

The main table coordinates the necessary information for each problem. The table contains a link to the classification table that identifies the problem type. It contains a field for the problem, five fields for possible multiple choice answers, five fields for comments on each of the possible answers, and a field indicating which answer is the correct answer. The five comment fields are variable length text fields and can contain html formatting statements. The problem field and the five answer fields can contain text with html formatting statements (they are fixed length fields 75 characters), links to a gif file, or links to a external text file. These external text files can be any type of html document including embedded links to gif files or other files. The default is

text. A link to a gif file is denoted by placing the "!" in the first position in the field followed by the relative URL for the gif file. A link to an external file is denoted by placing the "&" in the first position of the field followed by the relative URL for the text file. The relative URL for these files assume the root directory "*MUTester/Problems*." They can be placed in the *Problems* directory or any subdirectory thereof.

Requirements for Creating Additional Databases:

Template databases exist for the three standared databases: problem set, testing, and comments. The default databases, problemset.mdb, mutester.mdb, and comments.mbd are part of the initial installation. The template databases can be used to set up additional applications. Just copy the template databases and rename them as desired. If the new database is a problem set database, then information must be added to the MUTester.ini file contained in the include directory.

Software Distribution:

The current version of the software is available at no charge and can be downloaded from the web site "http:mathematics.monmouth.edu/MUTesterzip/". It is copyrighted software and should be treated as such. The free use comes with the desire that suggestions for improvement would be provided to the author. Finally, it is expected that the author will be provided free access to any derivative work.

Since the programs use 'asp' files on the server side and javascipt on the client side, the application must be accessed through an IIS compatable web server. The zip file mentioned above contains a set of installation instructions and the application software in the proper directory structure. Generally, the installation involves just unzipping the file and copying the MUTester directory with all the subdirectories to a web server. The web administrator might have to establish an alias to the phyiscal location of the root directory of the application -- the MUTester directory.

Resources Required for On-going System Administration:

In general, the system does not require extensive system administration beyond the initial setup. Not counting the problem database maintenance and the test administration and reporting, there are few system administrative tasks. Basically, system administration consists of:

1. The initial set up of the system -- This requires creating the MUTester directory on a web server and placing the application files and subdirectories in that directory.

2. Setting appropriate security parameters on the web-server -- In general those security issues are: read/execute permissions to the standard *iusr_servername* internet user account to the *MUTester* directory and all subdirectories. In addition, the *Databases* subdirectory must grant full control to the *iuser_servername* account. That setting is required for an Access database to operate in a multiuser mode. Access creates and deletes lock files in a multiuser environment.

3. Upsizing to SQL2000 server -- If the application is going to use files in an SQL2000 database, the appropriate databases will have to be imported into SQL. Normally this procedure will require the assistance of a system administrator. With the MUTester adminis-

trative tools described above, the requisite assistance will be only in upsizing to SQL, not with any maintenance issues.

4. Adding gif and text files to Problem directory -- The text and gif files that support the problems reside in the Problem directory. Normally, they are organized according to problem classification. These supporting files must be stored in the Problem directory on the web-server. Some procedures will have to be developed with the web-server administrator for the addition and deletion of items in the *Problem* directory. In a local area network, this could be accomplished by a share name being assigned to the directory and a drive map set up on the computer of the user responsible for maintaining the problem set databases.

Requisite Skills:

Other than the administrative tasks described above, the only technical skills needed to develop material for the system is the ability to create text files with some simple text editor (as simple as notepad) for the word problems; and the ability to create the gif files for complex mathematical expressions that cannot be placed directly in text or html code. MathType or the simple equation editor in Word would be adequate to produce simple mathematical expressions and saved as simple gif files.

References:

1. Richard Kuntz, *A Web-Based System to Support Practice Problems in the Classroom*, 12th International Conference. on Technology in Collegiate Mathematics (ICTCM), 1999

2. _____, *A WEB-Based Testing System for Introductory Mathematics Courses*, 33nd Annual Conference Association of Small Computer Users in Education (ASCUE), 2000.

3. _____,*Using a Web-Based Testing System to Support PSI in Remedial Mathematics*, Joint Mathematics Meetings, 2001

4. _____, *A WEB-Based Testing System for Introductory Mathematics Courses II*, 34nd Annual Conference Association of Small Computer Users in Education (ASCUE), 2001.

5. _____, *A Preliminary Assessment of a Web-Based Personalized System of Instruction Environment (with B. Lynn Bodner)*, MathFest 2002, July 2002.

6. _____, *On-Line Resources Supporting PSI (Keller Plan) Instruction in Remedial Mathematics and Algebra -- 2002*, 15th International Conference. on Technology in Collegiate Mathematics (ICTCM), 2002

7. _____, *A Web-based Computer System Supporting a PSI Environment (with B. Lynn Bodner) -- 2003*, Joint Mathematics Meeting, January 2003

Appendix A

Monmouth University -- Administrative Main Menu--
Mathematics Department

The following server and testing database will be used in these transactions -- Mathserv2000:MUT

These are the available administrative programs for the Monmouth University Mathematics Testing System --

Student and Class Maintenance Section

1. Add Students -- This screen adds new students to the database.
2. Add a Course Section -- This screen adds a course section to the schedule.
3. View and add/delete class roster -- This screen maintains the class roster. It adds and deletes students

Exam Maintenance Section

1. Exam Header Maintenance-- This screen maintains the list available exams.
2. Individual Student Exam Header Maintenance -- This screen maintains individual student exam header header records) regarding examinations. Students are not able to take examinations unless an exam he created. This feature can be used as a check on taking examinations in a random order.
3. Add Student Exam Header by Class-- This screen creates an Exam Header for all students is a specifi
4. Edit Exam Information -- This screen edits individual student exam information (score and pass/fall var

Report Section

1. Select Class for Progress Report-- This screen selects the course for printing progress report.
2. Student Progress Report -- Prints student progress report by individual student selection.
3. Class Attendance Report -- Student Attendance for entire class.
4. Individual Student Attendance Report -- This screen prints Student Attendance Reports for a specific i
5. Survey Reports-- This screen selects the class and survey and generates a report.

System Maintenance

1. Maintain Authorization Codes -- This screen maintains the authorization codes.
2. IP List Maintenance -- maintain IP Lock

Appendix B

Monmouth University
Mathematics Department

--Main Problem Database Maintenance Mer

Select Server and Database Name.

-- Select a Server --

Select 'New' to enter a new database information, 'Edit' to edit an existing information, or 'Delete'.

-- Select New, Edit or Delete --

Select Problem to edit Problem Table or Classification to edit Classification Table.

-- Select New or Existing Edit --

Submit Reset

Select Server and Database Name for a list of existing categories.

-- Select a Server --

Submit Reset

Optical Fiber: Bringing Bandwidth to the Classroom Cost Effectively

Mike Lynch
Vice Chair, Fiber Optics LAN Section
Marketing Manager,
3M/Volition
6801 RiverPlace Blvd., Austin TX 78726
MJLynch2@mmm.com
512-984-4811

Overview

Fiber optics technology, usage, installation and costs have changed significantly during the past several years. However, there are many lingering misconceptions about fiber. One of the major misconceptions is the cost of fiber versus copper. Because of this misunderstanding, many schools, businesses, and enterprises have stayed away from using fiber as effectively as possible in their networks.

The reality is there are many ways to use fiber in a network, where it will be both beneficial, and cost effective. However, network managers need to implement fiber so that it's advantages are utilized, and thereby receive some of the cost savings as well. Fiber is not for everyplace, and is does have to be used exclusively. It is the combination of copper and fiber networks using fiber where it can provide the most benefit that will help give network managers and educators the most bandwidth for their "pipe" and "bang for their buck".

During the presentation, we will quickly review some basic fiber facts, and discuss how fiber advantages can help in your LAN. Generic fiber and copper network designs will be reviewed, and specific campus designs will be discussed. We will conclude by reviewing the FOLS cost analysis formula, and other costing white papers.

Basic Fiber Facts –

- Index of Refraction - The index of refraction is the ratio of the speed of light in a vacuum to the speed of light in a material. The material must be transparent enough to pass some light through it. Light always travels through a vacuum faster than through a material, therefore, the index of refraction will always be greater than one.

- Internal Reflection - A fiber optic strand is made of two components called the core and the cladding. Light enters the fiber, bounces down the core and exits at the opposite end. The core has a different index of refraction than that of the cladding. When the light that enters the core comes to the core/cladding boundary, it will be bent away from the cladding and back into the core. This process is called total internal reflection.

- Attenuation - In copper systems we have loss that is called resistance. We measure resistance in ohms. In fiber we have loss. We call this loss (or decrease in power) attenuation

which we measure in dB (decibels). The lower the attenuation, the more light that is transmitted. Attenuation of the light can be caused by several factors:

1. Absorption of the light by materials in the glass.
2. Scattering of the light out of the core due to impurities.
3. Leakage of light out of the core due to exceeding the maximum bend radius of the fiber optic strand. This is called a macro bend. Once the light leaves the core, it is absorbed in the cladding.
4. Micro bends (high attenuation due to pin-point pressure). This can happen when water surrounds the fiber and then freezes, or a staple gun smashes a stable around a fiber cable.

- Electromagnetic Spectrum - The 4 basic wavelengths used in fiber optic data transmission are 850, 1300, 1310 and 1550nm. This is because fibers propagate the light of these wavelengths more efficiently (i.e. less loss or attenuation).
- Multi-mode & Single mode fiber - There are 2 types of fiber, single mode and multi-mode. Multi-mode means that there are multiple paths (or modes) for the light to travel down the fiber. The larger the core, the more modes it will carry. Standard sizes are 50um, and 62.5um. Multi-mode fibers are either step-index or graded-index. Step-index fibers have a distinct difference (a step) in the core's and cladding's index of refraction's. Single mode fiber is a step index fiber. It too has a distinct difference between the core and claddings index of refraction. Single mode fiber has a core that is about 10um in diameter.

Fiber Misconceptions –

Many people have inaccurate perceptions about fiber. These include factors around size, fire rating, connections, strength, and weight.

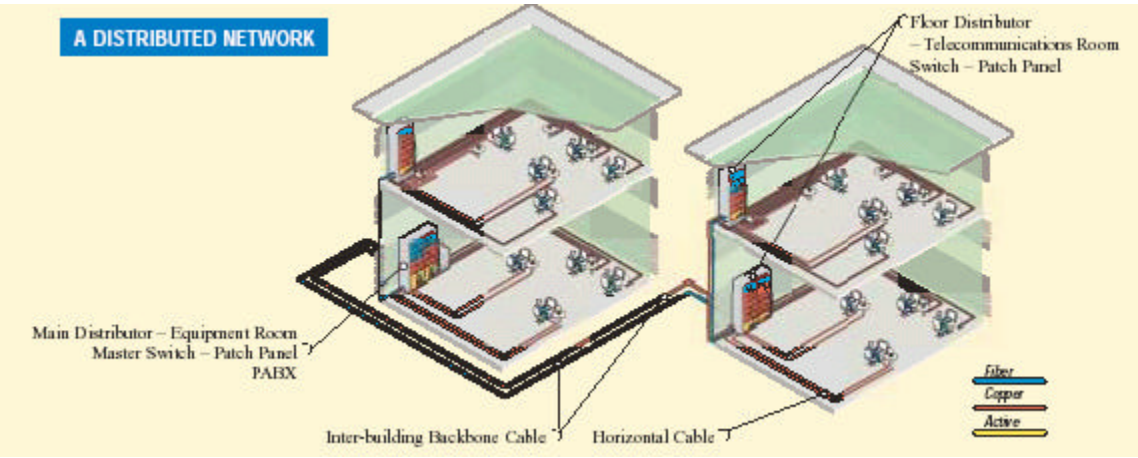
- There is a perception that copper cable is smaller than fiber cable. The fact is that fiber is 15% smaller.
- Another perception is that copper weights less than fiber. The fact is that fiber components are heavier, but fiber cable is lighter.
- The perception is that copper is more fire-resistant. The fact is that fiber is plenum-rated, compatible with various infrastructures.
- The perception is that fiber connections require special training, and take considerable time. The fact is that many small form factor connectors can be put together in under two minutes.
- A final perception is that fiber is fragile. The fact is the fiber is 4 times stronger than copper.

In addition to the misconceptions, fiber has several inherent benefits that are critical for its placement in a network. For example, network managers can run fiber three times longer than copper – at a minimum. Depending on the types of fiber, and the speeds being run, distances can be up to 10 times that of copper. Fiber is secure from physical 'break-in" or tapping. Fiber is also "interference-free". Electrical and mechanical surges will not interfere with the traffic on a fiber connection. Fiber has capacity for much more bandwidth than other cable mediums.

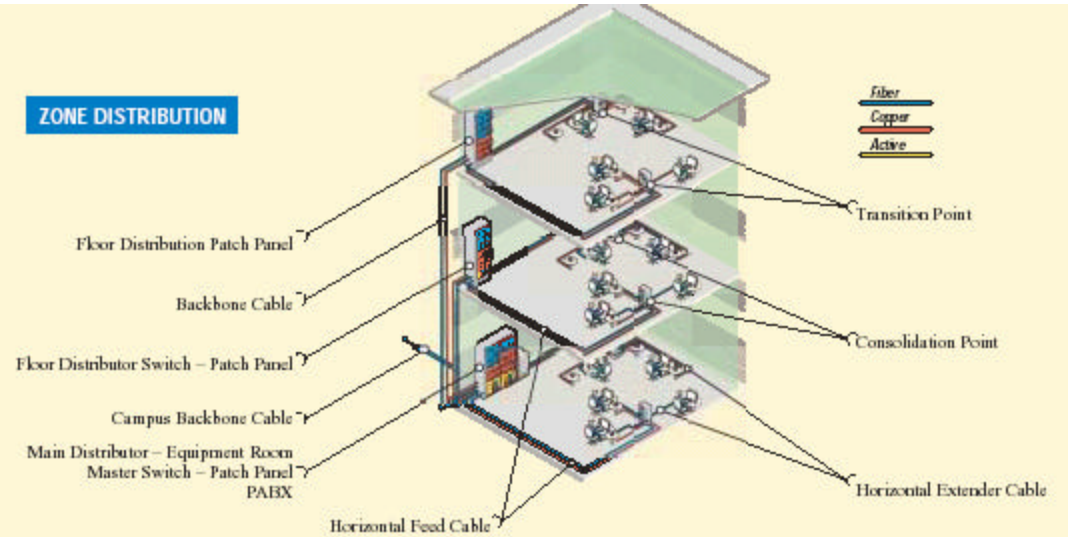
All of these features can be used to enhance a schools network when cost effectively integrated in a total fiber and copper architecture.

Fiber Network Configurations – Centralized, Zone, and Distributed Networks.

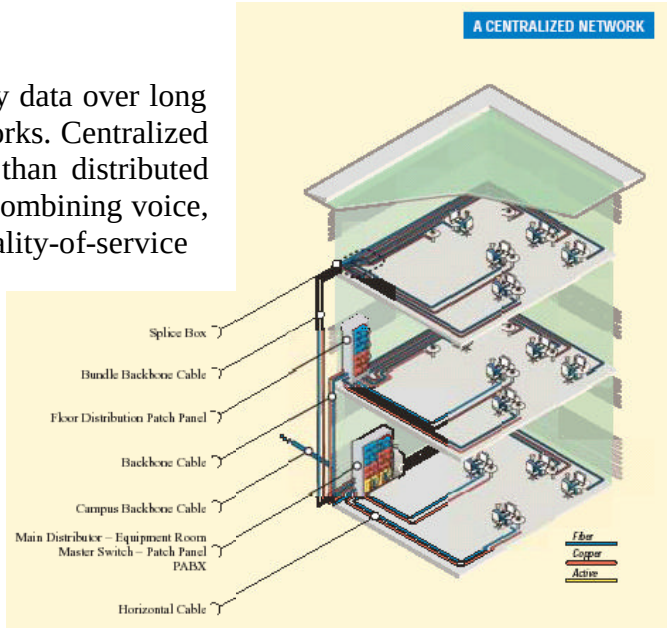
In the conventional distributed structured cabling design, backbone cable is optical fiber, where the horizontal segment of the network typically consists of twisted-pair copper cable or optical fiber cable. Backbone cables in an inter-building network travel from a main cross-connect (distributor) to one or more horizontal cross-connects within the telecommunication rooms on each floor.



Moves, adds or changes in an dorm or open-office environment can be accommodated quickly and efficiently through consolidation points by combining permanent feeder cabling with pre-terminated plug-and-play extender cables associated with the work area. Providing connectivity closer to end-users not only adds flexibility, but also reduces network downtime and re-cabling needs, which can result in significant cost

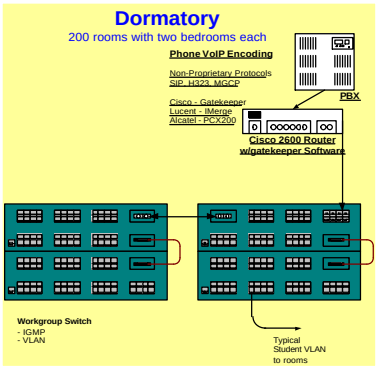


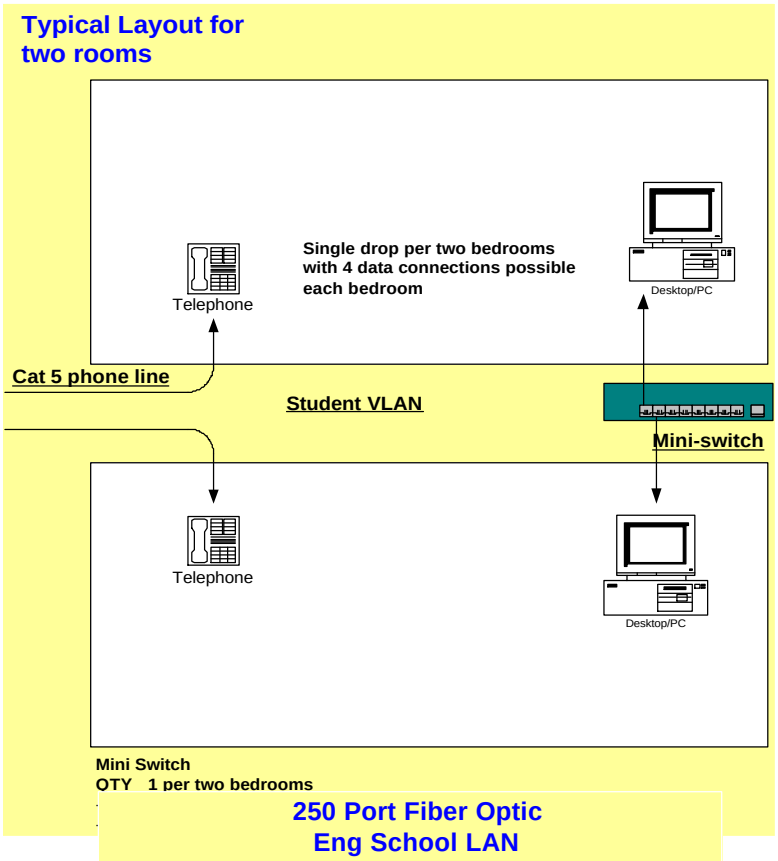
Optical fiber's bandwidth and ability to carry data over long distances is best utilized in centralized networks. Centralized networks have more unblocked bandwidth than distributed networks and are therefore better suited for combining voice, video and data traffic requiring quality-of-service implementation. Optical fiber eliminates intermediate closets, thus simplifying network layout, providing increased security, and reducing overall system cost. A centralized architecture is the most efficient, cost-effective and secure way to implement a network.



Generic Designs Applied to Specific College Networks –

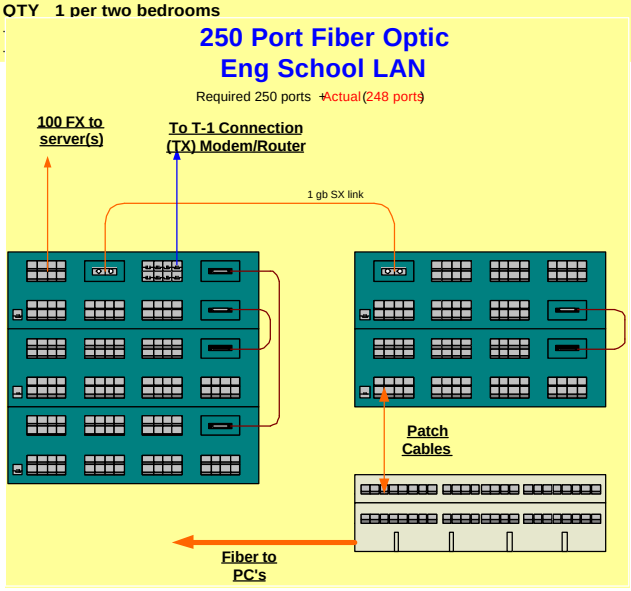
Applying the general network designs to the specific college LANs is where creativity needs to be combined with technology. There are specific rules, but using fiber and copper to get the most efficient network requires flexibility. Do you need to combine your phone lines with your data lines? Should you coordinate security networks with data networks? Do you have distance learning, or video conferencing? These and many other factors need to be considered. Some basic configurations for different areas of a college are seen in some of the diagrams that follow:





In all of these configurations, there are new things to consider like "switch verters" that can be used in dorms, or classrooms. How to use "tiny telecommunications rooms" or zones for passive cabling, media conversation, or simple switching can also help in efficient designs.

All of these designs are important because they can help lower the overall costs of your network, particularly a fiber LAN. Cost comparison tools can help you make the right decisions.



How To Compare Costs -

Two cost comparison resources will be used during the presentation. The first is a study by the Tolly Group entitled "Migrating to Fiber – The Case for Centralized LAN Cabling". This paper looked at all aspects of fiber and copper networks, and did a cost comparison between them. The cost savings included "hard" costs like, telecom closets, switches, cabling, connectors, installations, etc. It did NOT include "soft" costs like maintenance, upgrades, or moves, adds and changes. Their conclusion was that there could be considerable savings depending on your designs. Some of the specific conclusions included the following:

- Disparity in costs is largely attributable to the incorrect impression that fiber costs are higher than UTP.

- Designing fiber-optic networks based upon the design characteristics of fiber often will save thousands of dollars compared to copper.

- All fiber networks can save tens of thousands of dollars by shrinking (or even eliminating) some telecommunications rooms.

- To the list of fiber's well-known benefits of exceptionally high bandwidth and immunity to electrical interference, we can now add the benefit of significant cost reductions.

- In part, fiber networks have lower costs than copper/fiber due to simplified connector design and high-density, small-form-factor connectors.

- There are significant capital savings associated with centralized cabling. IT managers can enjoy reduced recurring costs over the life of the cable installation.

- Centralizing this equipment in a single physical location allows for more efficient delivery of air conditioning, better network management and control, and tighter system security.

- Rather than providing Gigabit Ethernet uplinks to the main equipment room in the distributed model, a centralized model allows users to connect directly to a backbone switch and leverage the bandwidth of the switch backplane.

- Faster troubleshooting and problem resolution in a centralized network. In fiber architecture this requires 2 people, and it often takes up to three for UTP.

- Expediting repair and minimizing downtime naturally translates into increasing productivity, revenues and customer satisfaction.

A powerful decision making tool for network designers is the FOLS cost model. This is the second resource that will be used to analyze fiber and copper networking costs. Though this model is biased against fiber, it shows that the cost of many all fiber network configurations is lower than the cost of typical fiber UPT networks.

This interactive model includes many of the aspects of the Tolly study, but this model can be tailored to a specific situation. We will use a few standard examples, but will also use the model to demo specific examples from attendees. An example of some of the model follows.

per node	per node	man-hrs		ALL FIBER NETWORK	per node	per node	or cost,$
64.00				fiber NIC	100.00		
9.00				fiber jumper to wall plate	15.00		
2.29				wall plate	3.00		
5.00	9.60	0.16		jack or barrels+plugs	3.00	10.00	0.17
18.00				horizontal fiber cable	45.73		
5.00	0.20	0.16					
5.00	9.60	0.16		2 mechanical splices	16.00	10.00	0.17
5.59	5.00	0.08		wall mounted enclosure	3.00	15.00	0.25
176.93							
8.08	0.00						
2.08	30.00	0.50					
				sub total	185.73	35.00	
300.98	54.40		**A**	**cost/port**	185.73	35.00	
21.95	0.00						
6.67	9.60	0.16					
0.00							
8.00	10.00	0.17					
21.00				vertical riser fiber cable	30.00		
57.62	19.60			**sub total**	30.00	0.00	
1.20	0.41		**B**	**cost/port**	30.00	0.00	

Conclusion –

The use of fiber in networks has been slowed by misconceptions about costs – particularly how fiber can be used in an efficient copper-fiber integrated network. Forcing fiber into an all-copper network design can negatively impact the efficiency of fiber, and increase total network costs. It is the creative combination of copper and fiber network designs that will provide the best technology solutions coupled with optimal cost savings. Understanding advanced fiber architectures and using the FOLS cost comparison model can help you find the best network design.

References

Source: Fiber Optic LAN Section (FOLS) "Interactive Cost Model for Horizontal Cabling: Fiber vs. Copper", http://fols.org/pubs/costmodel.html

Source: "Optical Networking Crash Course", Steven Shepard: McGraw Hill, 2001

Source: Tolly Group Report: "Migrating to Fiber: The Case for Centralized LAN Cabling", July 2000

Source: Horizontal Cabling Costs: Fiber vs. Copper Calculations", Cabling Installation & Maintenance Magazine, May 2002.

Professional Development: Keeping Abreast of Technology

Kuber Maharjan
812-348-7326
maharajan@purdue.edu
Dewey A Swanson
812-348-7238
dswanson@puc.iupui.edu
Purdue University School of Technology
4601 Central Avenue
Columbus, IN 47203
FAX (812) 348-7258

Abstract

Don't have $1500 to spend on a workshop to learn the latest technology? Do you feel like your students are more technically savvy than you are? Are you afraid to try that latest technology in the classroom because it may not work or will take too long to incorporate? Or maybe you just feel like you are so swamped with day-to-day responsibilities that you don't have time to keep abreast with technology that can help you in the classroom. These are all fairly common feelings among faculty. In this paper we will talk about not only what faculty can do to keep abreast of technology but also what the university's information technology group can do to efficiently train faculty and staff. We will share some of the low-cost but effective ways we've used on our campus.

Need for Training

There are approximately 1900 students at the Indiana University Purdue University Columbus (IUPUC) campus. There are approximately 60 faculty and staff on campus. The combined facilities of IUPUC and Purdue have five computer labs for the students with additional computers in the library and Student Services area. Faculty and staff have computers running Windows NT and using Microsoft Office products. All the computers in the campus are networked and have access to the Internet. Most of the computer labs are equipped with LCD projectors. Two of the labs are equipped with LinkSystem, which allows instructors to take control of all the student-computers and display instructor's monitor image and video from a VCR.

Students, faculty, and staff utilize the equipment on a daily basis. Software and hardware are constantly being upgraded by Information Technology personnel. These upgrades or changes in available hardware and software require training to effectively utilize these tools.

In order for faculty to take advantage of the technology training is a key. If faculty are not trained to utilize these tools they may go unused and become a waste of dollars. If used the technology provide the faculty with tools to assist in course management, preparation and delivery.

Barriers to Training

Although most will agree training is essential to properly utilize the available technology there are barriers to this training.

As faculty members one the biggest barriers to technical training is time. Teaching classes, advising students, recruiting, service, staying abreast of our own fields and publishing leaves little time for many of us to staying abreast of all of the technology that is available. To attend several two or three day classes in a traditional instructor-led environment is if not impossible not likely. Most would agree that the training would be beneficial but we all have priorities and with many of us this is not high on the list.

Another training barrier is the fear factor. Although, swamped most of us may feel comfortable in the routine we have for managing, preparing and delivering classes, or in our other duties as faculty. To do our duties in a different way, a way that we are comfortable with can be frightening. As developers in Information Systems we found one of the critical factors to success is to get user buy-in to a new system. Without user buy-in the system is doomed. Faculty members need to realize that professional development can be useful in making us more productive. Technology staff must also make the training non-threatening, not something we "have to do" but something we will want to do to help us in our daily responsibilities.

A final barrier that we face is the financial barrier. Typically one of the first cuts in difficult financial times is the training budget. With a weak economy universities like many industries tend to cut back on training dollars. At IUPUC, a state supported university we are facing the problem of shrinking budgets due to the problems of limited state funding. To send the approximately 60 faculty and staff to two three-day classes at IUPUC could cost $70,000. The training budget is no where near that number even in good financial times.

Universities like IUPUC must develop low cost effective ways to train faculty, and staff. We will look at what we have done at the IUPUC campus and what we intend to do. By sharing some of the successes and failures maybe we can help our faculty and other in attempts at professional development.

Approaches to Faculty Professional Development

At IUPUC we have conducted different types of "**Learn&Share**" and "**Technology Training**" sessions. The concept behind "Learn&Share" is to create an informal, non-threatening, user-friendly environment to learn new technology at users' pace not the instructor's pace. Usually each "Learn&Share" session covers only one topic. This way if a user misses a session he/she misses only one topic. These sessions are from 30 minutes to 45 minutes long and deals with a particular topic, such as, learning to use "review"ing tools of Microsoft Word. Because these sessions are informal and always meet at a computer lab to learn, experiment, and share with others. According to William Glasser, as reported in Kagan & Robertson, Cooperative Learning Co-op Facilitators' Handbook[1] , students retain 95% of what they teach someone else. These sessions are short, free, and full of fun. The idea here is to learn what individuals don't know and share what they know. "**Technology Training**" sessions are 100% instructor-led traditional

training sessions. Usually these sessions are conducted by our Information Technology Manager. Multiple of sessions are offered so that all faculty and staff are able to attend. Because the courses are developed and taught locally there are no additional costs involved. This is actually really good for information technology personnel as well, because information personnel do not need to spend much time assisting faculty/staff on one to one basis. The topics are selected by need basis.

Oncourse: *The Basics for Instructors.* Oncourse program is web-based teaching and learning environments developed by Indiana University. (http://oncourse.iu.edu).

Oncourse: *Beyond the Basics*. This course deals with advanced features of Oncourse system, such as uploading files, lectures, and assignments.

Outlook: *Customizing & Managing your Account.* This course deals with creating folders for organizing email messages and filtering junk.

Access: *The Basics.* This course is for individuals who have not used databases before. Fields, Records, Tables, and databases discussed, demonstrated, and practiced.

Access: *Relationships and Queries.* This course deals with simple queries and relationships.

Access: *Forms & Reports.* This course deals with forms and reports and how to create/modify/delete them.

Another way of learning new technology is via the Web at one's own pace. Once faculty/staff have access to the Internet they have access to a variety of tutorials on the Web. Information Technology department may already have developed and made these training materials available at individual's institutions. For example, Figure 1 and Figure 2 demonstrate web-based training sessions available at Purdue University and Indiana University.

Figure 1. Purdue University's Computer Training website.

Figure 2. Indiana University's IT training website.

There are a number of tutorial web-sites on any topics, if one's organization does not have one. Most of these tutorial materials are very good and also free. All faculty and staff need is time, patience, and connection to the Internet. Because one can learn at one's convenient time and

pace it can be a very valuable resource. As can be seen from the screen shot below it is very simple to find tutorials on one's interested topic. The screen shot depicts an example of using the "Google" search engine to locate tutorials on "Macromedia Fireworks". Individuals just need to follow the links and instructions to learn "How to use Macromedia Fireworks?" at ones own pace and convenience.

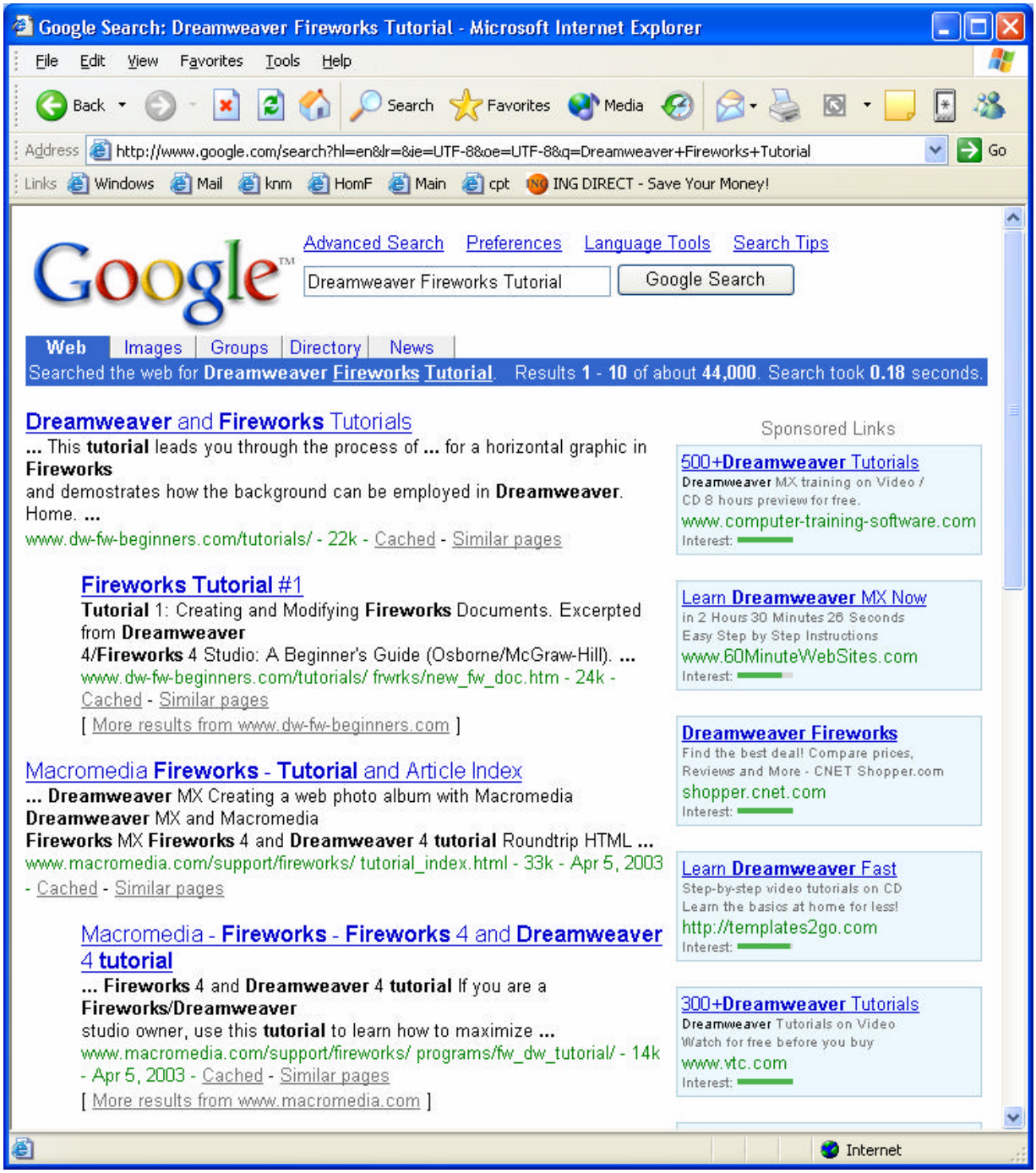


Figure 3. Searching for tutorials on how to use "FireWire" software.

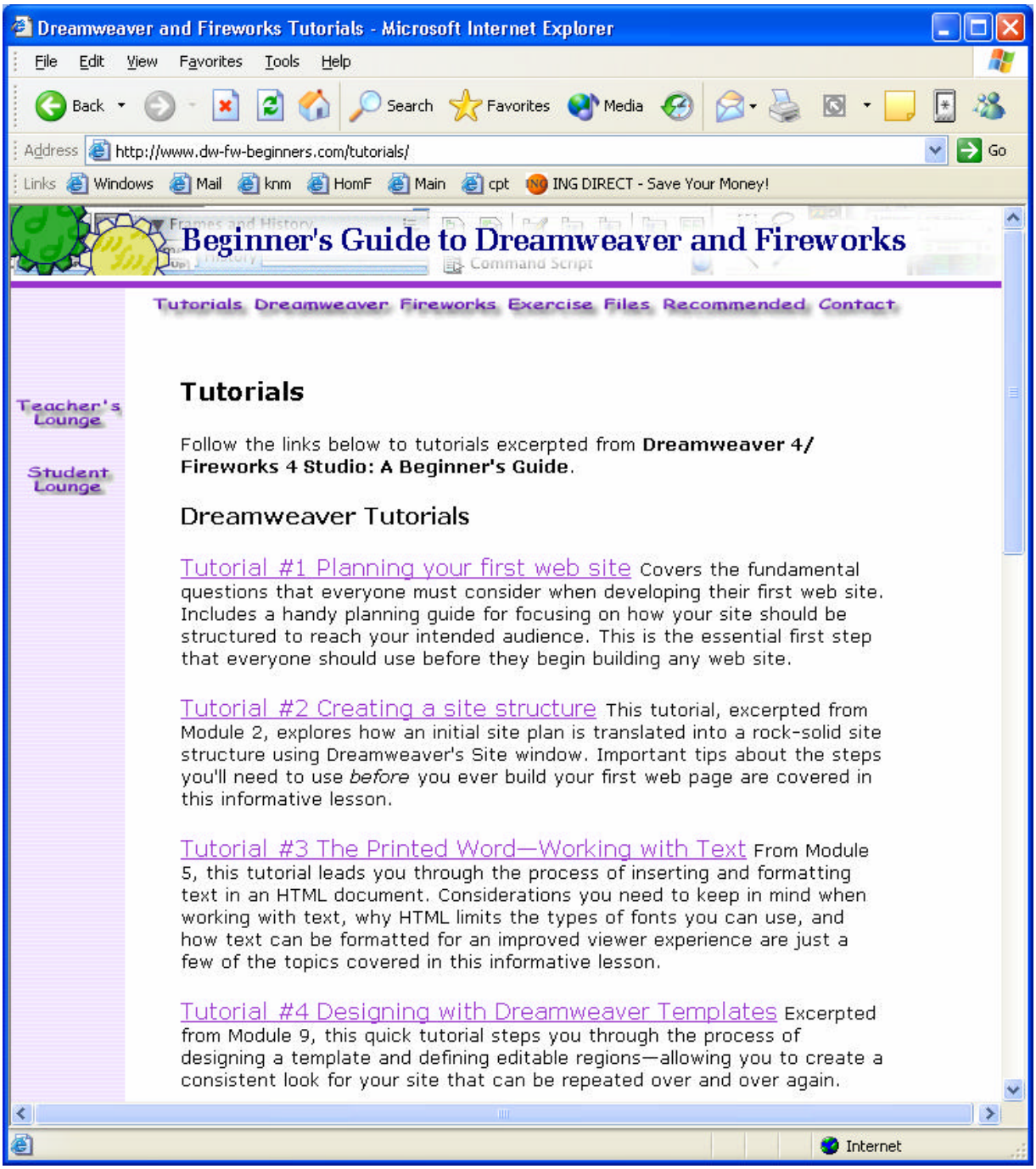


Figure. 4. Following one of the links from for tutorials on how to use "FireWire."

Another good thing about these tutorials is one does not need to learn any new technology to use these tutorials.

Finally, "**Active Lunch**" and "**Brown Bag Lunch**" sessions are popular in learning/discussing about new technology or any other topic. The basic idea here is to spend lunch hour productively as a group. Because of food and drinks, these sessions are held in regular classrooms or conference rooms. To keep the sessions really productive and interesting, these sessions are no longer

than 45 minutes each. Again the key philosophy behind this type of informal settings is to encourage every faculty/staff to attend, learn, and have fun at the same time.

Conclusion

The key to successful professional development to keep faculty/staff abreast of technology is by creating informal, smaller modules, technology sessions of various types. One type may be more successful than the other in different situations and locations. It is also best to develop these sessions locally as local information technology personnel are aware of the locations, situations, limitations, and know people well in smaller campuses. Because everybody knows each other everyone is at ease. Sessions are shorter, therefore, faculty/staff do not have to devote a lot of time at one time. Learning in the increments of small chunks is better than trying to learn everything at the same time, e.g. compressed course.

In this paper we have tried to show a number of easy and economical ways to incorporate faculty development. Some may already e available at individuals' campuses. If it not available mentioning to the local information technology group may stir an interest in development of such programs at one's location. With the Internet almost universally available individuals are only a few clicks away from tutorials at their home or office.

Web-Sites Referenced

http://ittraining.iu.edu/
http://oncourse.iu.edu
http://www.adpc.purdue.edu/DCS/
http://www.google.com
http://www.pt3.org/stories/faculty.html

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Promoting Faculty and Student Collaboration through IQ.Web

Jane McMonagle
SCT
4 Country View Road
Malvern, PA 19355
800-223-7036
jmcmonag@sct.com

Abstract

Smaller institutions offer the benefits of smaller student-to-faculty ratios, differentiating themselves from larger institutions by offering "high-touch," high-quality instruction and learning opportunities. Web functionality that supports collaboration and self-service can further enhance the positive interactions that lead to life-long learner relationships. The SCT PowerCAMPUS IQ.Web Internet suite enables faculty to deliver and administrate their courses online and provide their students with anytime, anywhere access to learning materials and real-time information. During this session you will learn how to view, download, print and email from the class list; create and configure your Gradebook online; automatically calculate and submit grades; upload files for your class to view and download; and communicate with your class online through your Course Homepage, Collaboration Center and Forums. You will also learn how faculty can utilize the online Academic Plan to advise students

Note: This session is a software demonstration and no paper is expected. The author will provide handouts at the conference or via the web or email.

Round Table Discussion on Wireless

David Metcalf
RWD Technologies

As RWD Technologies' chief learning technologist, David is responsible for the analysis, design and strategic alignment of RWD's technology solutions for learning. Dr. Metcalf joined RWD after the successful sale of Merrimac Interactive- a 1997 spinoff company from the NASA Kennedy Space Center Multimedia Lab that he was formerly head of. There, Dr. Metcalf ran the Web Interactive Training (WIT) project that produced some of the earliest, award-winning, Web-Based Training applications. He holds a B.A. in Computer Graphics from the University of Texas, an M.S. in Computer-Based Learning and a Ph.D. in Information Systems from Nova Southeastern University.

Note: Since this session is a roundtable, there is no paper for the proceedings. The results of this roundtable will be published in the fall newsletter.

Data-Driven Decision Making for Academic and Administrative Management

Rue Ann Michael
SCT
Malvern, PA 19355
800-223-7036
michael@sct.com

Abstract

SCT's mission is to help its client institutions promote individual achievement, enhance institutional performance, and foster educational communities worldwide. In addition to providing student- and administrative-information systems, SCT now offers a broad array of information solutions that unify teaching, learning and administration. NuVentive, a new SCT solutions partner, offers academic assessment and digital portfolio products that institutions can use to complement their existing administrative-records application. This session will include a demonstration of the NuVentive products and how they, in conjunction with Microsoft's Digital Dashboard technologies, can provide institutions with a comprehensive, "data-driven" view of their academic and administrative operations and performance.

Note: This session is a software demonstration and no paper is expected. The author will provide handouts at the conference or via the web or email.

Expanding the Possibilities with Web-Flex Courses

Ann Miller
Internet Instructional Administrator
Information Technology Services
Edison Community College
Piqua, Ohio 45356
937-778-7882
Amiller@edisonohio.edu

Abstract

Learn how Edison Community College merged the best of both worlds by finding a balance between courses delivered in a traditional face-to-face format with classes delivered totally online. This presentation will detail the steps taken by Edison to work with faculty to create an environment that enhances the learning experience for our students. Web-Flex courses have been enthusiastically received on our campus with requests from students for more web-flex classes. The web-flex option has freed up classroom space, given students more flexibility in completing course assignments, and moved many group project assignments to the online environment for collaboration.

Introduction:

Edison Community College, like many colleges across the U.S., has been struggling to get a handle on creating successful online courses. Enrollment and demand for online courses has always been high on our campus. Like many institutions we are working to monitor the content of online courses, trying to maintain the same pedagogical objectives in our online courses as we do for courses delivered in the traditional face-to-face format. A solution needed to be found to accommodate both the needs of the students, and the needs of the faculty and administration.

Two key pieces of solving this puzzle were the introduction of Blackboard on our campus as course management software, and a grant that was received from the Ohio Board of Regents (OBR), on our campus referred to as the "content grant".

Objectives

Equipment

The objective of pushing forward with a new method of delivery on our campus was a natural migration of two main initiatives on our campus, the smart classroom, and the flex courses.

Prior to receiving the content grant a few classrooms on the Edison campus were equipped with a computer, a VCR and a data projector. These classrooms were highly in demand on our campus, and were usually scheduled with classes from 9:00 am to 9:00 pm. There were a few portable smart carts that could be reserved for faculty who needed the additional technology, but this was limiting to full-time and adjunct faculty. The content grant enabled Edison to make every classroom smart. Each classroom is now equipped with state-of-the-art technology:

- Hewlett Packard E-PC42s
  - 1.8 ghz Pentium 4 processors
  - DVD ROMs
  - 256 MB of RAM
  - 40 gig hard drives
  - Windows XP Professional
  - 15" LCD displays

- Toshiba data projector
- JVC Super VHS – Video Cassette Player

Sixty additional computers were also purchased and placed on campus in the following locations:

- (15) The Learning Center
- (15) The Edison Library
- (30) The new Edison Internet Café

These computers were placed in key locations on campus to provide students with equipment and space to access and complete assignments that were delivered as the web portion of their web-flex classes.

Faculty Selection

Faculty from a cross-section of programs on campus submitted their names to the Academic Vice President to be considered for participation in the content grant. A total of 19 courses were slated to be created and delivered for the fall 2002 semester. Some of the programs included were business, nursing, sociology, early childhood development and biology. Many of the faculty in these areas began using Blackboard for web enhancement during the spring of 2002.

Before participating in the project full-time and adjunct faculty were each required to sign a contract that contained the following guidelines:

1. Blackboard must be the medium used to deliver the online content.

2. The syllabus for the course will demonstrate how the blended flex activities are integrated into the course learning objectives.

3. Appropriate links in Blackboard to support blended flex activities will be established.

4. The developed blended flex course will be available to serve as the common syllabus for all sections of that course.

5. Streaming video developed as a component of developed blended flex courses will be available for use in other sections of courses.

6. Participants in this grant will agree to share experiences with others during the development of course materials or activities.

7. Developers of blended flex activities and faculty that teach the courses will participate in course assessment (surveys, etc.) and will present this project to both internal and external groups.

Blackboard

Blackboard was introduced on the Edison campus during the summer of 2001. The initial intent when purchasing the Blackboard license was to put in place standard course management software that could be used by faculty teaching online classes. A few early adopters began using Blackboard in the fall of 2001 for enhancements to their face-to-face classes and the wave of users on our campus began to grow.

Faculty Training

Most of the faculty participating in the content grant were familiar with using Blackboard for a web-enhanced class, moving a portion of the assignments into the online environment required additional faculty training. Training sessions for faculty began in earnest in the spring of 2002. All faculty on campus were invited to attend the Blackboard training sessions. Bringing the faculty together for these training sessions offered benefits far beyond what could be accomplished in the one-to-one training sessions that had previously been offered. In depth study and discussion on each of the tools of Blackboard and how they could be used to deliver the web based tasks for the web-flex courses was explored further. The early adopters who had achieved some success using Blackboard as an enhancement began to investigate more options for delivering materials online, and for building online learning communities. Faculty were now working side-by-side with faculty in other disciplines, mentoring began to happen in the training sessions, and carried over after the training sessions ended. Faculty began to share resources and ideas that had been learned while using Blackboard for their particular course that would be effective for faculty teaching in other areas.

The web-flex courses required a higher level of technology skills than some traditional face-to-face instructors had used in the past. By working with the technologists in the ITS department faculty were able to convert hard copies of information into electronic documents that could be posted to the Blackboard site. Paper and pencil testing was also moved to Blackboard to be automatically graded and placed in the course gradebook.

The ITS technologists began working with faculty to show them how in some cases they could reduce their efforts in completing routine tasks and focus that time and energy on other areas of activity with students. One example of a technology based time saver was introduced for grading papers. Faculty learned how to use the track changes feature in Microsoft Word when grading student papers electronically.

Blackboard YOU

It became apparent during the early faculty training sessions that more time would need to be provided for faculty to begin building their courses in Blackboard. Blackboard YOU provided an opportunity for faculty to bring their course materials to the computer lab and work with technologists to build their Blackboard sites. Working with a technologist, instructors could discuss options for delivering portions of their class in the online environment.

Challenges

The courses in the content grant were required to be in the schedule of classes for the fall 2002 semester. The deadline for completion of the courses for review by the academic deans was set for July 31, 2002. This requirement meant that some of the work for development of these courses would need to be handled during the summer.

Weekly Newsletters

Because of the diversity of the group selected to participate in the content grant, regular meetings of participants were impossible to pull together. In an effort to keep participants focused and moving on task, a newsletter was created and e-mailed (and "snail mailed") to participants each week. The weekly newsletters featured pedagogical information for building activities online, information about a highlighted Blackboard tool of the week, and tips and suggestions for working in the online environment.

Course Review

Following the Blackboard YOU workshops, faculty were encouraged to view their course not only as an instructor, but also as a student. Some instructors asked for input from other faculty in their department, others worked with the ITS technologists for further fine tuning and suggestions for the web components in their course area.

Each course area created in Blackboard for the content grant had a login established for the academic dean. This gave the academic deans access to evaluate the pedagogical soundness of the online activities for the course and an opportunity to review and be assured that all objectives in the syllabus for the course were being met.

The course was ready for fall delivery---the next step was to add the students.

New format surprised some students

The new web-flex courses that were to be rolled out for the 2002 fall semester were listed in the college schedule book as web-flex. Many students, faculty, and academic advisors were not clear at the time of registration what exactly web-flex courses involved. From the lessons learned in the summer piloted web-flex biology class a training plan for students was put in place for the fall semester. An aggressive campaign of classroom orientations for the fall web-flex courses was undertaken.

Training was accomplished using the new technology in the classrooms by presenting the Blackboard course on screen for the students, and reviewing along with the instructor the content in the Blackboard course site. A mobile laptop computer lab was also used to ensure that students were able to log into the Blackboard site and access course materials. Additional two hour workshops were held to train students who needed further assistance with the Blackboard tools to access assignments, participate in discussions, and to use online testing.

Fall Semester Training	# Sessions	# Students
Orientation	5	51
Library/Learning Center	2	9
In-Class training sessions	27	324
Blackboard 2 hour workshops	6	25
Total	40	409
Spring Semester Training	**# Sessions**	**# Students**
In-Class training sessions	16	226
Blackboard 2 hour workshops	4	6
Total	20	232
Grand Total	**60**	**641**

Additional Blackboard support was developed for the spring semester for an online version of the Blackboard training. To date, there have been over 600 student page accesses to this online Blackboard tutorial. Online student access to the ITS technologists was also piloted using MSN Instant Messenger. Students could add ITS technologists to their MSN IM list. Student and technologist could then log into the Blackboard training area and work together on individual questions and problems with Blackboard. This greatly reduced the response time for students needing assistance with Blackboard.

Outcomes

Web-Flex Mode Satisfaction:

Students were surveyed at the mid term of the web-flex course to assess satisfaction during the first semester of the web-flex mode implementation. Students were asked the following questions:

- How would you rate your satisfaction with the web-flex instruction format:
  37 % Very satisfied with the web-flex format
  40 % Satisfied with the web-flex format
  19 % Somewhat satisfied with the web-flex format
  3 % Not satisfied with the web-flex format
  1 % No response

- What do you like about the web-flex format?

- What didn't you like about the web-flex format?

- What changes would you like to see?

The survey results were then shared with the faculty members in order to put in place improvements to the course before the semester ended.

Students and faculty members were both surveyed at the end of the fall semester to gauge their satisfaction, an adjustment was made to the initial survey, and the somewhat satisfied option was eliminated.

- How would you rate your satisfaction with the web-flex instruction format:
  46 % Very satisfied with the web-flex format
  40 % Satisfied with the web-flex format
  14 % Not satisfied with the web-flex format

- What do you like about the web-flex format?
  The number one comment from students was the convenience of this new format. Students like the ability to meet less frequently in the traditional classroom, yet still felt connected to the faculty through traditional class meetings.

- What didn't you like about the web-flex format?
  We found that some non-traditional students initially struggled in this new format.

- What changes would you like to see?
  A number of suggestions were provided by students to help faculty improve the course for delivery in future semesters.

The faculty survey included the following comments:

- Easy access to students, day and night! Saw much more interaction between and among students through the discussion board.

- Provides closer contact with students via e-mail. The student that is usually quiet in the traditional classroom often interacts more with the instructor on a one-on-one experience. More immediate response to individual students and group needs.

- It places more responsibility on the student for learning. It also allows students the flexibility and freedom of time and space for completing the work and course.

- For the students that I had, who had a lot of other obligations I thought that the format afforded them great flexibility. They had easy access to the material we covered, the schedule, and best of all I didn't have to carry around weeks worth of handouts for the students who had been absent and needed that material. More than ½ of my Web-Flex students took their tests and final exam at off-site locations. I think that this helped alleviate a lot of the stress that surrounds the test environment.

Web-Flex Course Growth:

Following the success of the fall 2002 implementation of the web-flex format, more instructors began to shift courses to this new mode of delivery.

- Fall semester 2002
  17 web-flex courses 241 students
- Spring semester 2003
  29 web-flex courses 363 students
- Fall semester 2003
  39 web-flex courses in the new schedule

Lessons Learned

Not all classes lend themselves well to the web-flex environment.

Some students in specific disciplines such as Human Services found the format did not meet their needs. The Human Services faculty member will continue to use the material created for a web-flex format as a web-enhancement to the course.

Some classes require a longer ramp up for successful implementation.

A biology course that was offered in the summer prior to the start up of this project received less than favorable reviews. With the suggestions of the students, and the ITS technologists, a few adjustments were made to the course, and for the fall semester, that course received a 100% satisfied response from the students enrolled in the fall web-flex version of this course.

Faculty training

During the initial start up for this grant, the 19 content grant participants received individual, and workshop training while developing their web-flex courses. The faculty in the content grant received additional materials through the weekly e-mails with information helpful to developing the online portion of their courses. New training and mentoring opportunities will need to be made available for new instructors moving into this mode of course delivery. Some previous training mechanisms such as Blackboard YOU, and the weekly informational letters will need to be put into place for instructors developing courses for the fall 2003 semester. Web-Flex courses that are currently offered will continue to be "tweaked".

New Initiatives for 2003-2004 Academic Year

Online Blackboard Training

The online Blackboard training area has been well received by faculty and students. Many of Edison's faculty members are adjunct faculty. Offering Blackboard training online for instructors would give them access to the training modules at their convenience. By presenting the ma-

terials to adjunct faculty in this manner, we will also be able to demonstrate "best practices" in offering information in the online environment. Target completion date: Fall 2003.

Content Grant Web Site

To continue the success of the web-flex courses, it is important to present a roadmap of where we have been in developing the courses, and where we are heading in this project. By sharing survey results and comments with all faculty interested in delivering courses in the web-flex format we can perhaps avoid some of the pitfalls experienced by the early adopters. Target completion date: Spring/Summer 2003.

Best Practices Training

The administration on this campus is supporting faculty who are working to develop courses with totally online, or partially online content by offering time for full-time faculty an afternoon of best practices training. Faculty who have been successful in the online environment will present their ideas and success in face-to-face on campus workshops. Target date of first offering: Fall 2003

Development with Full-time Faculty of Blackboard Course Shells

This initiative will pair full-time faculty members with ITS technologists to develop courses that can be copied and used by full-time and adjunct faculty members. The initial course development will focus on courses that are taught in multiple sections, and delivered by a high percentage of adjunct instructors. These courses will be developed with activities that can be used for web-enhanced, web-flex, or totally online courses. One of the pilot projects for this new project is the Personal Computer Applications course. This course is currently required for most degree programs at Edison. The course will not only include course work, but will also have a built-in Blackboard tutorial to guide students through the use of the technology as they are using the Blackboard tools in their course. Ongoing, target date for first course deployments fall 2003.

Expansion of MSN Instant Messenger Project

An effort will be made to expand the use of MSN instant messenger for both faculty and students for support for online, web-enhanced, and web-flex courses. The spring 2003 semester roll out was a small beginning that can easily be expanded for the fall 2003 semester.

The expansion of the MSN project will include both full-time and adjunct faculty members. MSN instant messenger will be used as a way to communicate for "real time" responses to faculty questions regarding Blackboard and their course sites. The ITS technologists will be able to work hand-in-hand in the Blackboard course site with faculty members as questions arise. This will help to alleviate the support concerns of the new faculty who will be moving toward the web-flex format for fall 2003. It may also encourage faculty to use MSN as a way to communicate with their students.

The number of web-flex courses for the fall 2003 semester has more than doubled from the numbers for the fall of 2002. It is a very real possibility that some students will not be able to attend face-to-face training sessions. Expanding the use of MSN and the online student Blackboard tutorial continue to support the high percentage of student satisfaction experienced in the web-flex course delivery.

Summary

Web-flex courses were warmly received by the majority of faculty and students on our campus during the first year of implementation. Lessons learned from the summer pilot course helped to push many of the initiatives that were put in place prior to the start of the fall 2002 semester. Each semester we have continued to improve training sessions and opportunities for faculty and students. It makes sense to begin working with faculty in web-enhanced courses, and then migrate to the web-flex format. We are constantly working with faculty and sharing information that will help them begin to see opportunities to move coursework traditionally completed in the face-to-face classroom, to a partially online environment.

Web-flex courses have created a win-win situation on our campus for students and faculty. Students have access to course materials and assignments from home, from the Edison library, the Learning Center and Internet Café. Learning communities are being formed in the Blackboard course area. Students are finding that the group function in Blackboard enables them to stay connected to not only their instructor, but other classmates.

Many of the initiatives that were developed to help faculty and students who participated in web-flex classes were beneficial to students enrolled in web-enhanced and online courses. The pieces of the puzzle individually may have made a small impact on campus. When the final puzzle pieces were locked into place with the deployment of the smart classrooms, the addition of Blackboard course management software, the additional computer access in the library, the Learning Center, and the Internet Café, and the willingness of faculty to participate in this new venture—a new era of technology emerged on our campus. Not the use of technology for technology's sake, but technology as a tool to enhance the learning experience for both Edison students and faculty.

"The value of an idea is in the using of it."
----Thomas Alva Edison

Update on the Allegany Wireless Wide Area Network

John Moore
Assoc. Dean of Computer Services
Allegany College of Maryland
12401 Willowbrook Road
Cumberland MD 21502
jrmoore@allegany.edu
301-784-5312
http//:allegany.edu

The presentation will cover innovative communications solutions used by Allegany College of Maryland, which operates five instructional sites in three counties and two states. AC's fully integrated communications network, combining voice, video, data and Internet, uses new-generation wireless microwave technology to hurdle mountainous terrain and leapfrog a cumbersome patchwork of conventional communications providers. In creating its own communications network custom-designed for its needs, the college thus improved connections for its approximately 500 employees and thereby strengthened education for its 3,200 credit and thousands more continuing education students.

AC's Associate Dean of Computer Services, John Moore, will explain how the college devised and implemented a communications system that is not only better and more reliable but less costly. The Cumberland-based college's journey down this communications highway began when it branched out, in 1989, to offer courses in Somerset, Pa., and a year later in Everett, Pa. Both towns are in neighboring Somerset and Bedford counties to the north. For several years, communications needs were relatively simple, as courses were held in the evening at Somerset and Everett high schools and local campus administrative space was borrowed where the college found it.

Communication needs grew when each campus acquired its own quarters in 1994 (Somerset) and 1995 (Bedford) and expanded its schedule to include daytime classes, added more academic programs and saw enrollment rise. The college assembled a communications system using conventional telephone service providers, but doing so meant it had to work with five phone companies – an unwieldy arrangement at best. While voice transmission was satisfactory, transmission of computer data, over the same modems used by residential Internet customers, was not adequate for the organization. Soon, the college sought to expand courses at its two Pennsylvania campuses by introducing distance-learning technology through a compressed video signal carried through phone lines. But the system proved less than satisfactory for this purpose, showing itself to be only as strong as its weakest link. There were occasional breaks in service, and it was costing too much for a long-distance call.

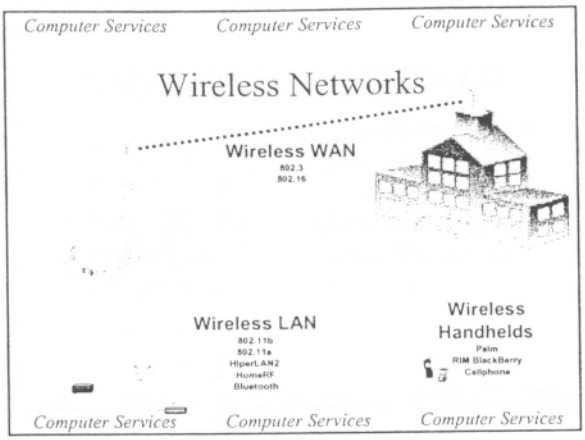
The college realized it needed a permanent, continuous link among its three college campuses, so it went to a higher capacity system using a T1 line more suitable for business applications. A full T1 line linked the Cumberland system to the outside world, which in turn was linked to its two Pennsylvania campuses with a half T1 line to each. Communications improved and costs were stabilized, but there were still shortcomings. When a circuit went down, we had to deal

with five phone companies, it was a real challenge trying to get it all back up and running again. Then, there was the expense. When the project was first started the monthly cost was around $4800. Every few months, the bill would go up. By the time the college had paid its last such bill, in December 2000, the tab had risen by more than 30 percent.

Aware of emerging wireless technology, we tried to interest representatives of large companies that we met at information technology conferences. But given the college's comparative small size and its long distance from the metropolitan markets, none could be drawn. We later turned to TWR Communications after we realized the Cumberland-based firm had added wireless capability to its services. The company developed a proposal that included radio transmitters and receivers and rooftop dishes to connect with its microwave towers atop the mountains. The TWR agreement provided the college needed wireless equipment, from Western Multiplex Corp., and maintenance for five years, after which AC will own the equipment. Monthly lease payments with TWR, plus rent of a non-TWR tower on Tussey Mountain in Bedford County, are significantly less than previous communications bills the college was paying. Moreover, the amount will remain stable over the five-year period. Implemented in January 2001, the wireless communications system was instantly successful. Reliability has improved with not one break in communications faulted to the new network. Quality of signal, including video picture, has been upgraded. And data transmission has been increased, because the wireless network's bandwidth is greater than that of its phone-line based predecessor; a full T1 line, carrying 1.5 megabits of information, now runs to each Pennsylvania campus. In April 2001, the college arranged its Internet service, which to that point had some reliability shortcomings of its own, through TWR. Where its service formerly came through a three-quarter T1 over phone lines, the college now receives the Internet via a full T1 line delivered by the wireless technology system. And the monthly bill is now two-thirds of the previous expense. The new system provides more bandwidth for less money. It supports voice, video, data, and Internet, all at T1 speed.

The college's new Gateway Center, home to the School of Hospitality Tourism and Culinary Arts, is the latest of AC's five instructional sites to benefit from this wireless communications technology. This site went on line with a wireless connection in fall of 2001. The Faculty and students at that Baltimore Street location are now fully integrated into the college communications network using a wireless connection that includes voice over IP technology.

In the fall of 2002 as the use of the network continued to grow the college started planning for the need to again increase bandwidth. Internet usage had continued to grow and problems occurred with access to some of the more advanced software at the Somerset Campus. We started planning for another upgrade of our wireless WAN. This new upgrade will provide increased bandwidth in the main core of the wireless network to support 100 megabits of IP bandwidth and it also offers 2 T1's to carry video and voice traffic to each of the Pennsylvania campuses. The link to each Pennsylvania campus has been upgraded to support 10 megabits of IP bandwidth and a T1 for the video and voice over IP traffic. The upgrade includes new radios to provide the increased bandwidth and new network switches to allocate the bandwidth to the required locations. This presentation is a follow-up to a session from last year and will focus on the upgrade project that took place during the spring of 2003.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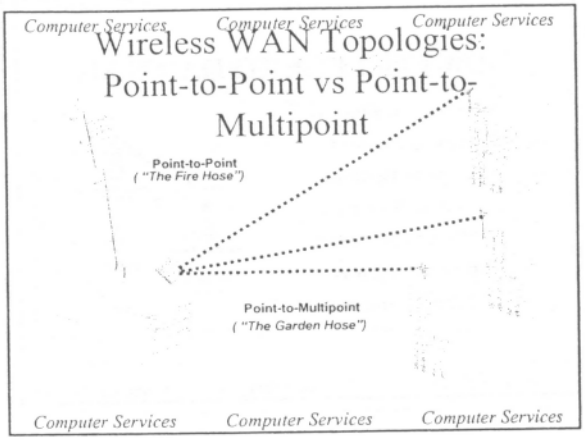
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Point-to-Multipoint
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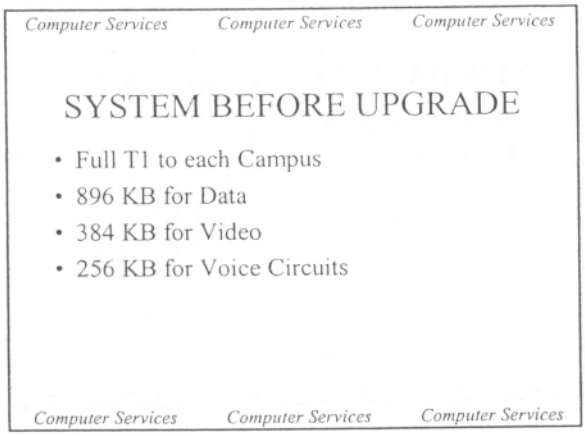
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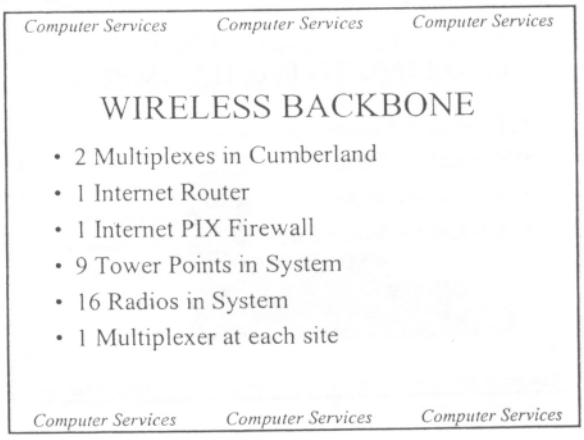
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WIRELESS BACKBONE
• 2 Multiplexes in Cumberland
• 1 Internet Router
• 1 Internet PIX Firewall
• 9 Tower Points in System
• 16 Radios in System
• 1 Multiplexer at each site
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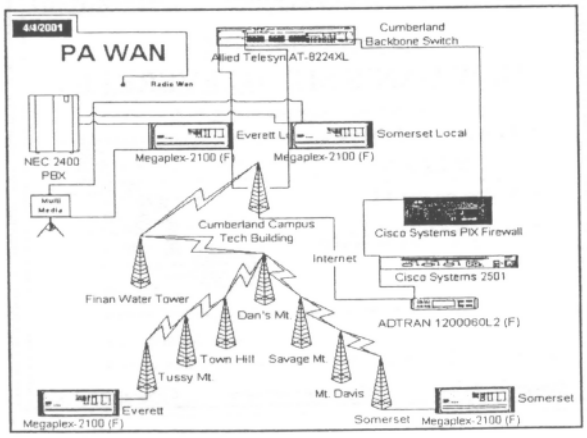
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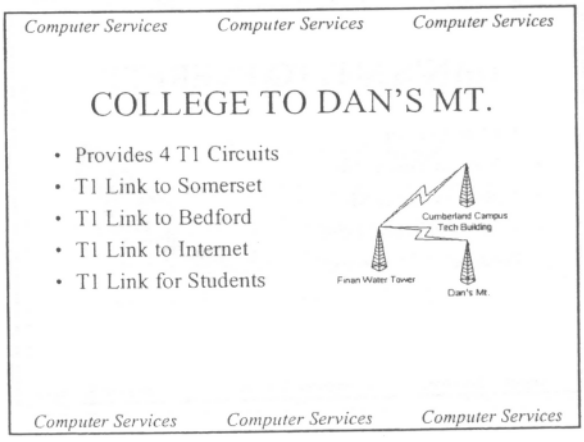
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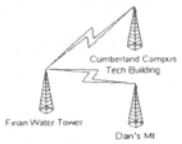
COLLEGE TO DAN'S MT.
• Provides 4 T1 Circuits
• T1 Link to Somerset
• T1 Link to Bedford
• T1 Link to Internet
• T1 Link for Students
Cumberland Campus
Tech Building
Finan Water Tower
Dan's Mt.
Computer Services Computer Services Computer Services

Computer Services Computer Services Computer Services

NEW COLLEGE TO DAN'S MT.

- Provides 100 Mbps IP
- T1 Link to Bedford
- 10 Mbps to Bedford
- T1 Link to Somerset
- 10 Mbps to Somerset
- 1 Mbps to Gateway
- 4.5 Mbps to Internet

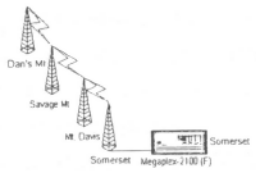


Computer Services Computer Services Computer Services

Computer Services Computer Services Computer Services

DAN'S MT. TO SOMERSET

- 1 T1 to Somerset
- Tower on Savage Mt.
- Tower on Mt. Davis
- Voice Video and Data
- Provides 2 T1 Circuits



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OLD LINK TO EACH CAMPUS

- T1 to each Campus
- 896 KB for Data
- 384 KB for Video
- 256 KB for Voice Circuits

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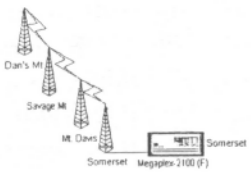
NEW DAN'S MT. TO SOMERSET

- Provides 10 Mbps IP
- 1 T1 to Somerset
- Video on the T1
- IP Voice on the T1



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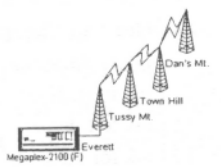
DAN'S MT. TO EVERETT

- 1 T1 to Everett
- Tower on Town Hill
- Tower on Tussy Mt.
- Voice Video and Data
- Provides 2 T1 Circuits



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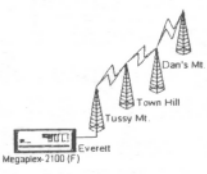
NEW DAN'S MT. TO EVERETT

- Provides 10 Mbps IP
- 1 T1 to Everett
- Video on the T1
- IP Voice on the T1



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RADIO EQUIPMENT

- Western Multiplex/Proxim
- Tsunami
- Spread Spectrum 5.8GHz
- 4 Radios with 100 Mbps & 2 T1
- 12 Radios with 10 Mbps & 2 T1
- 2 Radios with 4 Mbps

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Transmission Bandwidths

	Speed (Full Duplex)	Latency (milliseconds)	Distance (per link, 99.999% availability)	Deployment Speed	Cost
Optical Fiber	10 Gbps	< 3 ms	Infinite	Many Months	$$$$
Copper (leased lines)	1.5 Mbps-45 Mbps	< 3 ms	Infinite	Months	$$
Free Space Optics (lasers)	622 Mbps	15 ms	~200M	Days	$
Satellite	64 Mbps downlink 2 Mbps uplink	30-240ms (each way)	Infinite	Weeks	$$
Wireless WAN (Tsunami)	430 Mbps	< 3 ms	64 km	Days	$

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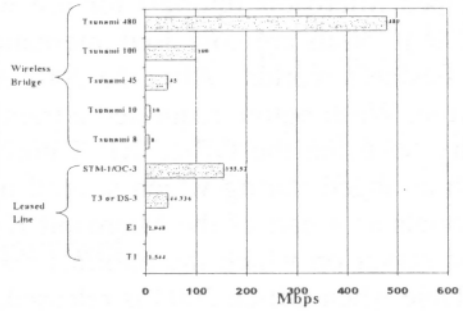
Wireless Ethernet Bridge vs. Leased Line Bandwidth



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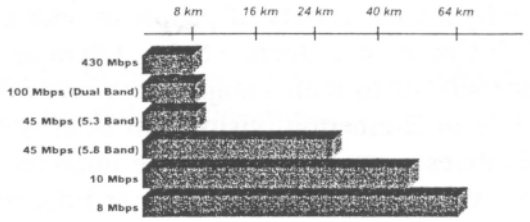
Typical Distance vs. Capacity Tsunami Point-to-Point



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Misconceptions

- Only for short distances
  - Wireless technology provides greater than 40 miles per "hop"
- Weather affects the communication
  - Rain, snow, hail, etc. problems just begin at 10 GHz, most Wireless Ethernet bridges operate at 2.4GHz, 5.3 GHz & 5.8GHz and are not affected by weather
- Has security problems
  - Wireless Ethernet provides multiple layers of security including transmission coding
- Throughput is low
  - Wireless Bridges provide throughput approaching 1 Gbps
- Not as reliable as fiber/wire
  - Wireless links routinely exceed 99.999% availability and < 10^{-12} BER

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NETWORK UPGRADE

- Before 1.5 Mbps to Each Campus
- Campus to Dan's Upgrade (100 Mbps)
- Dan's to Bedford Upgrade (11.5 Mbps)
- Dan's to Somerset Upgrade (11.5 Mbps)
- Dan's to Gateway Upgrade (4 Mbps)

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Progress Report – New Initiatives with Microsoft

Tom Murray
School of Business and Economics
Director, Technical Education and Training
Information Technology and Resources
Lynchburg College
Lynchburg, VA 24501
Phone: (434) 544-8265 Fax: (434) 544-8693
e-mail: murray.t@lynchburg.edu
Cindy Hudson
Information Technology Help Desk Supervisor
Randolph-Macon Woman's College
2500 Rivermont Avenue
Lynchburg, VA 24503
Phone: (434) 947-8103 FAX: (434) 947-8138
e-mail: chudson@rmwc.edu

Abstract

For the past several years, Lynchburg College has developed Microsoft tutorials for use with academic classes, and faculty, student and staff training. The tutorials are now used internationally by a wide variety of people in both the academic and business worlds. After the 2002 ASCUE Conference, Joanne Salas, Olympic College, Bremerton, Washington, requested a training session/visit to their campus to work with selected faculty on using the Office XP Tutorials. While in Bremerton, visits with Microsoft personnel were arranged during which several new initiatives were discussed. One initiative includes the tutorials as a part of the Microsoft K-12 (Innovative Teachers) and Higher Education websites. The server on which the tutorials reside will be provided by Microsoft. New tutorials will be available when Office 2003 is released. In the meantime, Office tutorials will be created using Beta Office software supplied and supported by Microsoft.

In addition, we are working on a free Microsoft Office Certification for students, faculty and staff at K-12 and Higher Education institutions. Another initiative, "Best Practices," for K-12 and Higher Education, is also under study. This will be a Microsoft forum where faculty/staff will be identified as having created "something" applicable to Microsoft software, which can be of wide application to everyone, and available at no charge. It is contemplated that "winners" will receive a Tablet PC, Microsoft software and cash. This presentation will furnish the latest information on all of these initiatives, as well as some others which are "unfolding" at this time.

Each participant at this session will receive a copy of the current tutorial CD.

Microsoft Office Tutorials Website

In early January 2003, Microsoft contacted Lynchburg College and indicated they would fund a website to host the Microsoft-Lynchburg College Office Tutorials. Both Lynchburg College and Randolph-Macon Woman's College are recipients of Verizon-Council for Independent Colleges

in Virginia (CICV) funding grants. Because of this, Verizon was contacted and became the Internet Service Provider (ISP) for the tutorial website. The website is now active at:

http://www.officetutorials.com

The website is funded by Verizon and Microsoft. Since ASCUE members have been so significant in the dissemination of the Microsoft-Lynchburg College Office tutorials, permission was received from ASCUE to create a hyperlink to the ASCUE website. A thank you message to ASCUE members, thanking them for their contributions, was also included.

Microsoft Professional Development Site

Approximately one month after the Office Tutorials website was activated, Microsoft announced that Lynchburg College had been awarded a 2003 Microsoft Model Professional Development Site award. The award included:

- A Pocket PC
- Microsoft Class Server License and 200 Student CALs
- A copy of Microsoft Office XP
- A copy of Encarta Reference Library 2003
- Model Professional Development Site Public Relations Template
- Model Professional Development Site Award

The letter also indicated that Lynchburg College would be featured in the Microsoft Education website with a webpage detailing the contributions of the tutorials to education.

Equipment

As the tutorials have evolved, Dell Computing has taken an interest in installing the tutorials on each Dell Education system sold. This summer, Dell will place the Office XP/2002 or 2003 tutorials on each computer sold, by Dell, to a Private College Campus in Virginia. Depending on the response to this initiative, a decision will be made to expand this installation geographically. Since the authors give Office Tutorial presentations at a number of computer meetings, training sessions, and conferences, Microsoft, Dell and Motion Computing funded a Motion M1200 Tablet PC on which to create the Office 2003 tutorials and from which to give presentations. Microsoft desired that, in addition to presentations on the tutorials, that the new Windows XP Tablet PC software be demonstrated as well. The generosity of Microsoft, Dell and Motion Computing is acknowledged in the Office Tutorials website.

Microsoft Office 2003 Beta Software

To make sure that Office 2003 Tutorials will be available, when Office 2003 is released in July 2003, Beta software and support have been furnished to the authors of the tutorials. In the past, once the software had been released, the tutorials were created. Now, the tutorials will be available on the Office Tutorials website when the software is released - and available on CD as well.

A number of people have asked why the Office 97/98 tutorials are still available. The authors have found that, since many charities, churches, volunteer literacy centers and job centers receive "old" computer hardware donations, this equipment is not capable of supporting Office 2000 and beyond. So, the tutorials will remain as long as there is a need for them.

At this conference, the authors will preview the Beta Microsoft Office 2003 programs and tutorials. The tutorials will be available when Office 2003 is released by Microsoft.

Microsoft Office Certification

Currently, the authors are working with Microsoft on a "no cost" certification program for students, teachers and staff at K-12 institutions. A higher education certification is envisioned as well. As this certification program proceeds, ASCUE members will be kept informed of its progress.

K-12 and Higher Education Best Practices

Another initiative envisioned by Microsoft is a program tentatively identified as "best practices." Schools and institutions that have, in place, some form of Microsoft initiatives which are applicable to an international audience will be awarded a "best practices" incentive which will include hardware, Microsoft software and cash. These institutions will be featured on the Microsoft Education website as they are announced. As this program proceeds, ASCUE members will be kept informed of its progress.

Conclusions

A CD containing the "current edition" of the Microsoft-Verizon-Lynchburg College tutorials will be available to each participant at this presentation. The CD will contain all of the tutorials, in the 97/98/2000 and XP/2002 format.

All of the Microsoft-Verizon-Lynchburg College Office tutorials can be downloaded from:

http://www.officetutorials.com

Microsoft Office 2003 tutorials will be available at the above web site this summer.

Connecting the Dots

Julie A. Phillips
Associate Professor, Organizational Leadership and Supervision
Purdue University School of Technology Columbus
4601 Central Avenue
Columbus, IN 47203
(812) 348-7207
japhillips@puc.iupui.edu
Donna J. Evanecky
Assistant Professor, Organizational Leadership and Supervision
Purdue University School of Technology Kokomo
Kelley Center, Room 250
2300 South Washington Street
Kokomo, IN 46904-9003
(765) 455-9364
djevanecky@puk.indiana.edu

Abstract

Connecting the world of quality with computer information systems is essential for the future success of students in the workforce. At Purdue University School of Technology, the Computer Information Systems Department (CPT) has utilized quality and statistics course work in their curriculum. The idea behind this collaboration is not only for the student to be an expert in the computer field, but to also fill the gap that usually exists from non-systems thinking in organizations. When reflecting about systems thinking "all events are distant in time and space, and yet they are all connected in the same pattern. Each has an influence on the rest, an influence that is usually hidden from view." (Senge, 1990) In order to fill this void, the course work focuses on systems thinking: which encompasses variation, customer focus, continuous improvement, communication, team work, etc. Once the students understand the concept of systems thinking they are better able to connect the dots and see the organization in its entirety and contribute to the optimization of the whole.

Introduction

Total quality management (TQM) was a major business trend in the 1990's. It was deemed that the quality of the product or service lie in the realm of responsibility of the quality department. However, organizations have since learned that quality is critical for success, not only for success, but survival in this competitive global economy. Hence in order to not only survive but to obtain the competitive advantage, organizations have made total quality management everyone's responsibility. Organizations are training current employees in every functional area in the body of knowledge of TQM, besides, hiring recent college graduates that already possess this skill. At Purdue University School of Technology the CPT department states, "Our discussions with college graduate recruiters suggest that an "obsessive" attitude toward quality management will become an essential characteristic of successful systems analysts (and all information technology professionals)." (Whitten, Bentley, and Dittman, 2001) Hence the CPT department has added

TQM to their curriculum. This paper will further delve into the specific quality topics that are covered in the curriculum for the Systems Analysts with specific emphasis on systems thinking and customer focus. Through further analysis of this relationship between quality and curriculum one can better understand their importance in determining the success or failure of any organization.

CPT Courses

Various courses within the CPT curriculum for Systems Analysts contain references to TQM and the importance for the Systems Analyst to understand and apply the methodology in order to be successful in the program and in industry. Specific courses include:

> CPT 172 Database Application Development: This course introduces the development of information systems through the use of a database. Topics include business information systems, system and application development, database management systems, problem solving, logic, data types, and programming using database technology. Given a database design and application requirements, students design, construct, and test a personal computer information system.
>
> CPT 280 Systems Analysis & Design Methods: Comprehensive introduction to information systems development. Topics include the systems analyst, the systems development life cycle, methodologies, development technology, systems planning, project management, systems analysis, systems design, systems implementation, and systems support. Introduction to tools and techniques for systems development.
>
> CPT 380 Requirements Discovery and Modeling: This course is an advanced study of systems analysis and design focusing on object-oriented methods, techniques, and tools. Topics include object-oriented technology, object-oriented methods and techniques to analyze a business problem and design and implement a solution, use-cases, object models, requirements gathering, effective communications, project management, and cost-benefit analysis. Emphasis is placed on working in a team environment to model and design a solution to a "real-life" business problem.
>
> CPT 480 Managing Information Technology Projects: This course introduces the application of knowledge, skills, tools, and techniques that project managers use to plan, staff, estimate, and manage information technology projects. Special emphasis is placed on learning and applying the concepts of managing scope, risk, budget, time, expectations, quality, people, communications, procurement, and externally provided services. Students will apply project management technology and techniques to business problems.

These courses focus on continuous process improvement, problem-solving skills, working with the customer, assessing the customer's needs, communication with the customers, measurement, and systems thinking, all topics that are part of TQM. Also it is a theme that is reinforced and expanded on throughout the freshman, sophomore, junior, and senior years.

Non CPT Courses

There are two additional courses that students take in the Systems Analyst curriculum for the Bachelor's of Science degree in CPT; they are a statistics course and OLS 484 Leadership Strategies for Quality and Productivity. OLS stands for Organizational Leadership and Supervision, a sister department in Purdue University School of Technology which works to educate and develop graduates who are career-ready for leadership roles in business, industry, and service agencies.

The statistics course is any basic statistics course that is offered on the campus. The purpose is for the student to understand frequency distribution, descriptive statistics, elementary probability, normal distribution, applications, sampling distribution, estimation, hypothesis testing, and linear regression.

OLS 484 Leadership Strategies for Quality and Productivity is a study of how organizational leaders create an environment conducive to high levels of employee self-motivation, quality, and productivity. The principles of TQM are presented from the work of Dr. W. Edwards Deming. Topics that are covered are: systems thinking, variation, profound knowledge, the red bead experiment, tampering, control charting, continuous improvement, PDCA model, Taguchi Design of Experiments, Kano Model of Customer Perceptions, problem solving tools, etc. These topics are covered to show what leaders do with the knowledge that they glean from the data that is generated from all of the above. It is an approach that the student is in a leadership role and he/she learns how to take the information that is given to them, analyze the data and listen to what the data is telling them, in order to make the most efficient and effective decisions.

This is the course work that emphasizes TQM in the curriculum for a Systems Analyst. This curriculum is evergreen, with updates and inputs added based on input from the industry and new research. Through this active approach to curriculum revision based upon research and industry needs, students will be on the cutting edge with regard to knowledge of quality. Students graduating with a Bachelor's of Science degree in CPT from Purdue University School of Technology have invaluable TQM skills that they will be able to utilize in their positions as Systems Analysts.

The authors' involvement in the above curriculum for CPT stems from their professorship of the OLS 484 Leadership Strategies for Quality and Productivity course, as well as previous work experience in the quality arena. The remaining section of this paper will discuss two topics in detail that are prevalent in understanding TQM. The topics include: systems thinking and the voice of the customer with specific emphasis on their relevance to the Systems Analyst.

Systems Thinking

For the Systems Analyst, as for any discipline, systems thinking is a useful and critical tool. If a Systems Analyst can see how the changes they make affect the rest of the organization, the more fruitful their decisions will be. Systems thinking is important for everyone in an organization to understand and be able to apply. Systems thinking means, "a system is a network of interdependent components that work together to try to accomplish the aim of the system." (Deming,

1994) For organizations to be managed effectively, they must think in terms of relationships between and among departments instead of independent components. By doing this they optimize the whole, instead of individual department within an organization, thus creating a win-win for all.

So what does this mean for the Systems Analyst? They must see themselves as part of the entire organization and what their contribution is to the overall good of the organization, not define themselves as solely "The Information Technology (IT) Department". Once a department identifies themselves as "The IT Department", they make themselves an individual profit center, only focusing on their needs. By doing this they lose sight of the overall mission/vision/purpose of the organization. Sometimes a particular department might take a loss or add an additional cost to their department's budget, while the overall net effect for the corporation is great. Thus everyone wins. However, if the company is divided into profit centers, then no one wins.

> One executive was shocked to find that his organization had 132 "profit" centers (most of which never had any revenues), each trying to optimize its own profit. It's hard to image the destructive forces that were loose: time spent arguing about transfer prices, games played, moving inventory….He changed to one profit center so they could all work together. (Joyner, 1994)

Another aspect of systems thinking is the concept of blaming the process not the person. When problems arise it is standard practice to find the "who" and not the "what". In systems thinking, the "who" is not part of the vocabulary. The focus is on the "what", what caused this to happen, now let's work together to get rid of the "what." In systems thinking the "what" is analyzed in detail in order to put in a short-term fix to protect the customer, while pushing for the long-term fix to alleviate the problem. In order for this to work effectively, cross-functional teams work on the causes of the problem, not the symptoms of the problem. " Even though contemporary society has the tendency to divide the world into neat arbitrary subdivisions, life comes to us whole and must be looked at through the systems lens." (Senge, 1990)

The Voice of the Customer

The Voice of the Customer is what the customer is saying about their needs and their perceptions of how well the organization is meeting those needs. " In order to fully listen to the customer's needs, an organization needs to adopt a philosophy that the customer belongs to the organization, not a particular functional area within the organization." (Joyner, 1994) Once a customer has adopted this philosophy, they need to define, "Who is a Customer?". A good starting point is based on the work of Brian L. Joyner. An organization needs to ask itself the following:

-Who are our major customers or categories of customers?
-How do our products or services reach our customers?
-What characteristics are most important to various customers and how each step in the customer chain adds value?
-How does our organization work as a system? (Joyner,1994)

Once this is developed and understood, all functional areas, IT included, can determine their input in the customer value chain. Thus, meeting the customers needs.

There are two models that can be used to better understand the needs of the customer, Kano's Model of Customer Perceptions and Taguchi Loss Function. Kano's Model of Customer Perceptions is based on three categories of customer perceptions:

1. Must Be's – characteristics or features that we take for granted. If they are absent we are dissatisfied, however if they are present we are only neutral.
2. More is Better – in this category we are disappointed if a need is poorly met but have increasing satisfaction the better the need is met.
3. Delighter – these are the characteristics or features that surprise customers. Since they are unexpected, there is no negative effect if they are absent; but when present they have a positive effect. (Joyner, 1994)

Since the above model deals with customer perceptions, the organization needs to thoroughly understand what about the product or service that is provided to their customers are the "must be's" and the "more is better", while continually working to "delight" their customers. By understanding this model all departments in the organization, IT included, understand their part of the customer value chain. Thus they are better able to set priorities in their own work, and measure how well they are meeting the customers' perceptions.

Understanding the customers "must be's", are sometimes difficult to determine. A model that can be used is the Taguchi Loss Function. The premise behind the Taguchi Loss Function is organizations must determine what the customer wants. Taguchi defines this as the target. It is important to understand that the target is defined by the customer, not the supplying organization. Taguchi goes on to state that the further away from the target that the product or service is, the greater the loss to society. Simply, if the customer wants the target, that is what they want. Anything that deviates from this is a loss. " To deliver world-class quality to our customers, we must understand their perceptions of value." (Joyner, 1994)

Both of these models can help organizations better understand the voice of the customer. By listening to the voice of the customer and making continuous improvements based on the customer's voice, organizations will put themselves at a competitive advantage over organizations that choose not to. Thus, the IT department needs to determine their piece of the customer value chain, and work diligently to satisfy the voice of the customer.

Conclusion

This paper has only skimmed the surface as to quality's role and importance in every discipline. If one understands the system they work in and the customers effected by that system they are better able to have a positive influence on the outcome. Having employees that possess the skills to understand the system and the customers related to a given systems is the foundation in any organization. Hiring employees with these skills no matter what field of expertise is critical to the organization's success and bottom line.

Building TQM principles into every curriculum has merit and can benefit the individual as well as the organization as a whole. In order for organizations to meet the challenges of a global economy, quality must be designed into, built into, and maintained at all levels.

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Wake-up! Computer Assisted Instruction in the Collegiate Music Appreciation Classroom

Scott L. Phillips
Music Education
Transylvania University
300 North Broadway
Lexington, Kentucky 40508-1797
(859) 233-8254
sphillips@transy.edu

When most college students think of Music Appreciation, they envision another one of those "boring" general education courses. Maybe it's the monotone professors droning on about times and places to which the students can't relate. Perhaps it's the endless lists of important names and dates to be memorized. Or maybe it's simply having to listen to all that "classical" music. Whatever the reason, Music Appreciation seems to have earned the reputation on most college campuses as a good class to register for if you need to catch up on some sleep.

My own experience in music appreciation was not a good one. I was in the second semester of my freshman year at a large private University. I had signed up for music appreciation because I really enjoyed music and thought that this class would be very informative. I remember entering the auditorium on the first day and seeing about 150 other anxious students. As class started, the professor began playing an excerpt from a symphony on a record player at the front of the room. We listened for several minutes in silence. Finally he stopped the music and began to discuss the piece we had just heard. I frantically tried to take notes on his lecture, but I was unfamiliar with the music he had played, and had no way to relate his lecture to the music we had listened to. Before I was able to grasp the gist of his lecture, we were listening to another example. It was only the first day of class, but I was already lost. The rest of the semester proceeded in similar fashion. Somehow, I managed to pass the class, but at the end of the semester, I certainly didn't feel like I was better able to appreciate music.

I don't think that students sleep through music appreciation because the subject matter is boring. In fact, the study of music's history is filled with interesting people, colorful stories, sordid love affairs, and powerful political commentary – and all this with its own built-in sound track! Music appreciation can open up a whole new world of understanding for many students, however, the subject matter is often presented in such a way that students find themselves as outsiders looking in on this world, rather than recognizing that they are a part of it.

When I began teaching music appreciation myself, I was determined to help students become part of this world of music. I decided that the best way to do this was to structure my class around something that is so much a part of their world – technology. Students in my music appreciation classes become interested and involved in the learning process because as I fully integrate the use of technology in my classroom instruction and homework assignments. My tools in this process include a "Smart Cart", the Internet, a course website using Blackboard, software programs such as CakeWalk, PowerPoint, Finale, and Cool Edit Pro, and interactive listening guides on CD ROMs that correlate with the paper textbook.

Classroom Instruction

The first important component in making my Music Appreciation class interesting and effective is to incorporate technology into the classroom instruction. With the use of a "Smart Cart" or "Smart Classroom" I can incorporate video clips, PowerPoint presentations, interactive CD ROMs and the World Wide Web in an interactive delivery that gets students interested and keeps them involved in the instruction.

The "Smart Cart" is a portable station that houses an LCD projector, a laptop computer, a DVD/VCR player, and a stereo with good speakers. This unit is the easiest way to bring multimedia interaction into any classroom. In some new lecture classrooms, these components are hard-wired and mounted in the room with a controller embedded in the lectern. This is known as a "Smart Classroom".

The components of the "Smart Cart" can be used to great advantage in the Music Appreciation classroom. One way to do this is with video presentations. For example, I supplement my discussion of Wagnerian *leitmotifs* with clips from *Star Wars*. The study of opera is much more interesting and better understood when DVD clips of the opera can be viewed on a large screen. Additionally, many music appreciation texts are paired with companion videotapes for instructors to use as a supplement to lectures.

Another way the "Smart Cart" can be of use is by including PowerPoint presentations. Professors in many disciplines have used PowerPoint to improve the effectiveness of instruction, however, in music there are some specific advantages. Through a fairly simple process, CD recordings can be aligned with the slide changes in PowerPoint creating an interactive listening guide. Slides can be created that illustrate musical form, coincide with the text, or delineate major sections of a musical example while the example is playing. Also, PowerPoint provides an easy way to display small photos, or sections of a musical score for the entire class. For example, I was able to "pass around" photos of my recent trip to study Bach's Calov Bible without wasting any class time or losing the students' attention (see Figure 1).

Homework Assignments

Another way I incorporate technology into the Music Appreciation classroom is through homework assignments. My students are required to purchase the *Understanding Music* textbook by Jeremy Yudkin. This text is packaged with a set of CDs containing many of the listening examples that I require the students to be familiar with throughout the semester. A CD ROM accompanies this set of CDs. During the first day of class instruction, I tell students that they are to load the CD ROM onto their personal computers. I also have a copy of the CD ROM loaded into stations in the music technology lab. The CD ROM contains interactive listening guides for each of the musical examples on their CDs (see Figure 2). In their personal study, students can access the music we have discussed in class. The interactive listening guide highlights important elements of the music in real time, allowing for focused understanding of each musical example (see Figure 3). Since students own the CDs, they have access to the musical examples throughout the semester at any time when it is convenient for them to study. Most students have no trouble navigating the CD ROM, and find it a very engaging and enjoyable way to study.

In addition to the interactive listening guides, I assign music technology projects to my students. These projects incorporate use of the Internet with music technology software and allow the students to interact with music in new and exciting ways. For one assignment, students are asked to use a music-sequencing program to create Gregorian Chants. Another assignment requires students to use a music-recording program to splice together music from different time periods. Yet another assignment asks students to download a midi file of some classical masterpiece, import it into a music notation program, and then change the instruments to create a modern version of the masterpiece. Students learn a great deal about music as they use familiar tools such as computers and the Internet to manipulate music in ways they never thought they could. All of these kinds of activities keep the students very interested and involved in the music appreciation course.

Additionally, all details of my course, including course expectations, assignments, grades and so forth are found on the course's Blackboard website. Blackboard is a program used by many universities to manage class and registration information. It can be especially effective in the music appreciation classroom because in addition to its regular functions, I can use the site's bulletin board to post musical files. In one instance, I was able to post a recording of my Women's Chorus singing a French *Chanson*. My music appreciation students could get online and go to the course website to access the recording at any time in their preparation for their exam.

Summary

The collegiate Music Appreciation course has earned the reputation as a boring General Education elective. However, technology can be very effective in creating classroom instruction and homework activities that are engaging, interactive, and highly educational. The use of technology such as a "Smart Cart", video clips, the Internet, music software programs, and CD ROMs can help to turn the sleepiest college students into active music appreciators.

Figure 5. Example of a PowerPoint presentation on Bach's Calov Bible

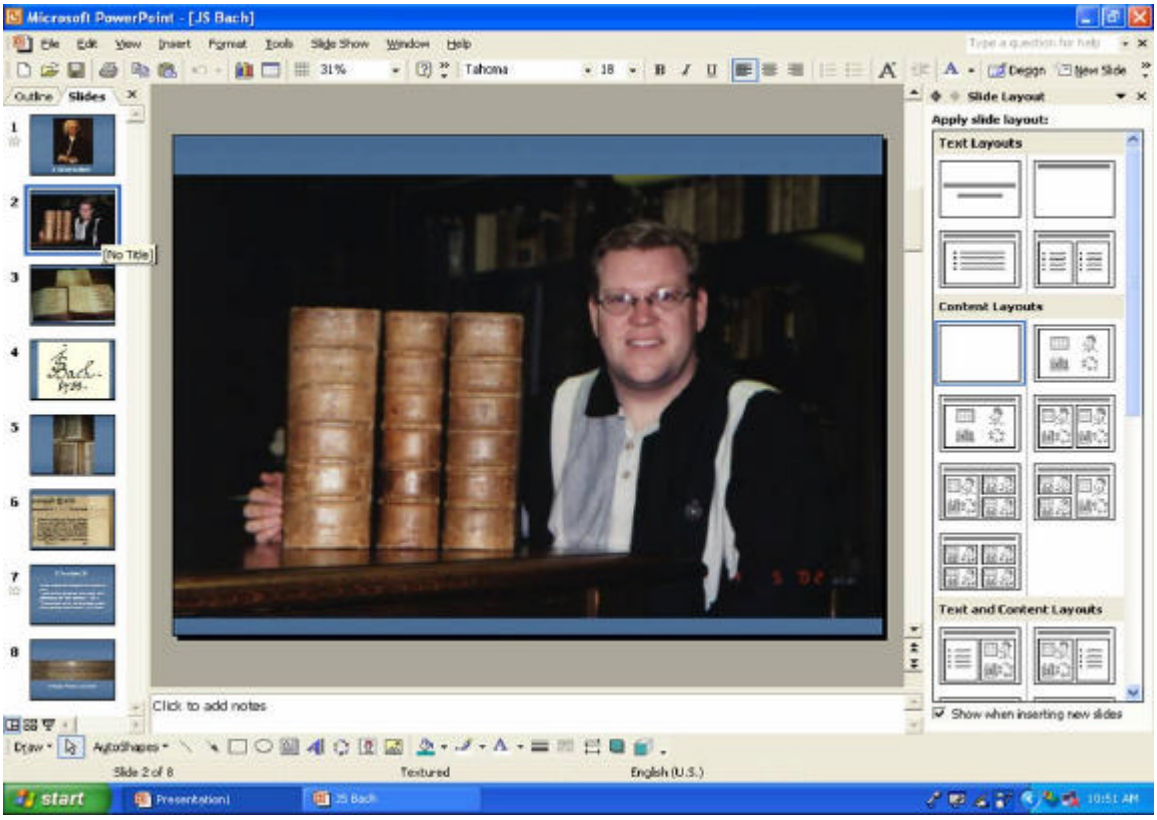


Figure 6. Table of Contents Screen for Understanding Music CD ROM

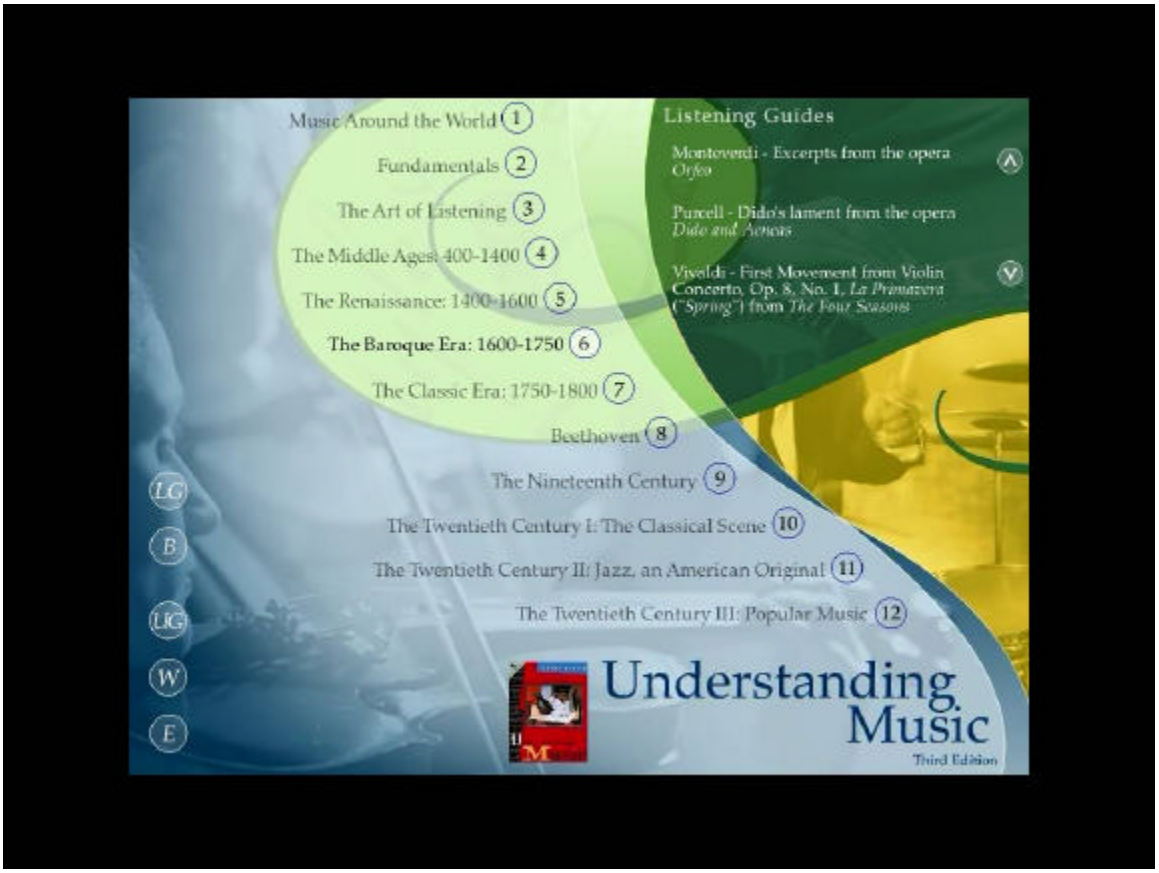
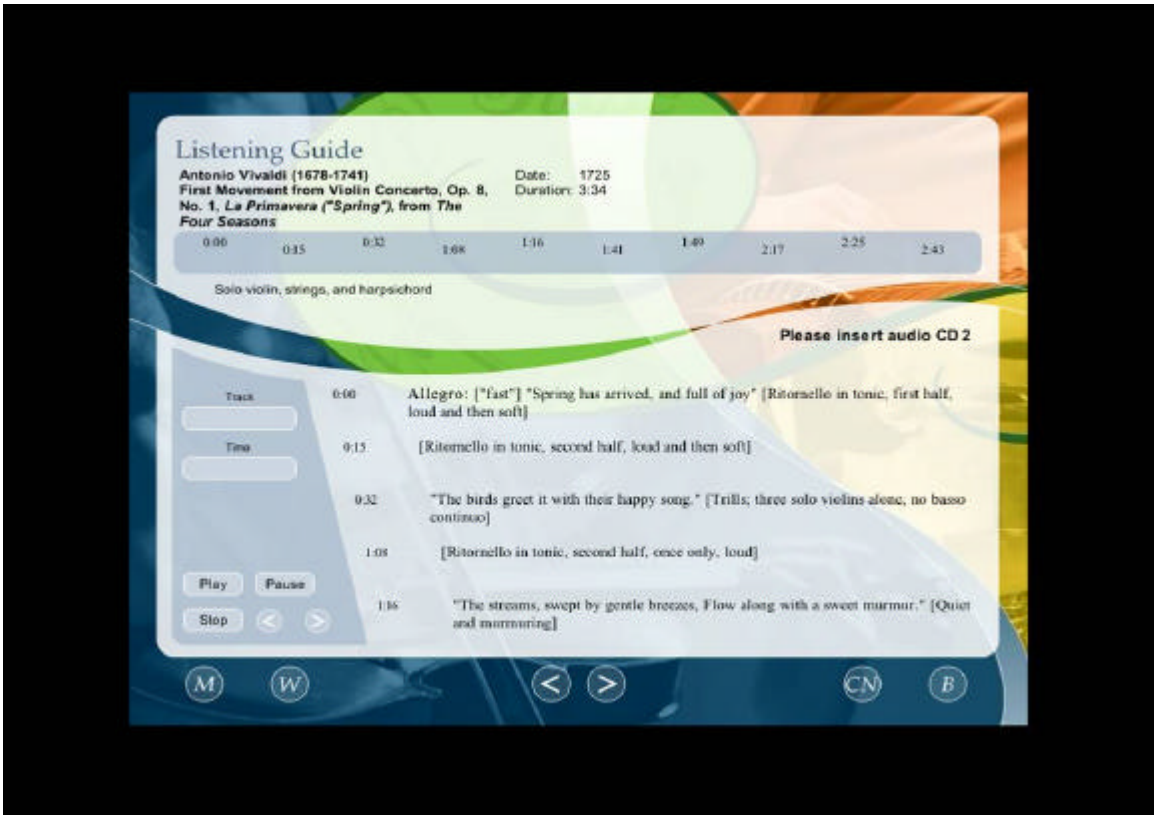


Figure 7. Interactive Listening Guide for Antonio Vivaldi's *Spring*



Using a Course Management System to Improve Instruction

Thomas A. Pollack
A.J. Palumbo School of Business Administration
Duquesne University
Pittsburgh, PA 15282
(412) 396-1639
pollack@duq.edu

Abstract

Over the past several years, technology has affected our instructional process in many positive ways. A course management system (CMS) can be a useful tool to help an instructor meet defined teaching aims and help students achieve learning objectives. A CMS such as Blackboard 5.5 allows an instructor to make various types of course materials readily accessible to students via the Internet and also provides online discussion and communication opportunities. The CMS can be used as a vehicle to deliver a course online or as a supplement to the learning process for a traditional face to face course.

This paper will explore some of the potential uses for a CMS, specifically referencing Blackboard 5.5. Primary emphasis will be placed on ways to use the CMS as a supplement to the learning process in a traditional course setting.

Introduction

The popularity of Course Management systems or e-learning systems has grown substantially over the past several years. A 2002 Gartner Research Survey reported that 95 percent of colleges and universities are now employing e-learning systems as part of their educational delivery (Weinstein, 2002). Young (2002) reports that indeed course management software has become a fixture on many campuses and that approximately 20% of college courses now use the software. As the capabilities and demands for CMS products has increased, so too have prices. Young further reports that typical CMS products that only a few years ago cost a few thousand dollars will cost in the "six figures" annually for many institutions. Many sales contracts for CMSs are based on headcount. The escalating cost structure creates a serious financial problem for many institutions whose faculty have now become accustomed to using CMSs in a variety of ways. In a short time, CMSs have become mission critical systems for many institutions (Young). As a result of the significant price increases, many institutions are being forced to use older, low-end versions of CMSs. These versions do not have the most up-to-date capabilities, and many in the industry believe the low-end versions will disappear shortly. In partial response to the significantly higher prices, the Massachusetts Institute of Technology and Stanford University are leading an Open Knowledge Initiative Project that will develop a course management system and eventually provide free course management software. The project will also identify technical standards to which future CMS products will likely be compelled to adhere (Arnone, 2002).

The most popular vendor names associated with CMSs are Blackboard, Web-CT and eCollege. All major vendors admit that the expectations of CMSs are very dynamic, and development ef-

forts to remain current and competitive are intense (Syllabus, 2002). Most of the CMSs are functionally similar and enable a professor to implement an educational philosophy (Brown, 2002).

Originally designed with the specific intention of delivering courses for distance education, CMSs have evolved into much more diverse and versatile applications. For example, Brown (Ibid.) suggests that a CMS can be used as a tool on which an academic department can deposit materials and hold discussions and chat sessions. At the Duquesne University School of Business, we have adopted the Blackboard CMS in a similar role as it serves as our School intranet tool. As the CMS tools become more comprehensive and versatile, their range of uses will be limited only by the imagination and creativity of their users.

A number of professors, including the author of this paper, have discovered that many students from face to face courses like the learning environment created by a CMS course supplement. It is an ideal communications medium, and is particularly helpful in dealing with working adult learners.

Historically, significant educational research has been conducted on the learning process and how students learn. One consistently mentioned essential ingredient for student learning is the degree of engagement between the student and the material to be mastered (Johnstone, 2002). Most educators agree that good instruction promotes active engagement and CMSs provide students with opportunities to work with course content. Ansorge and Cooley (2003) assert that "Web based instruction provides students with instantaneous access to current content and gives instructors more time to interact with students by freeing them from mundane repetitive tasks such as transmitting content to students…" Ansorge and Cooley go on to say that good instruction also promotes communication and interaction, another quality enabled by CMSs.

Blackboard Learning System ™ Course Management System

In this section, this paper will present a number of the major features inherent in the Blackboard Learning System ™ course management system. The paper will then describe several ways that the CMS can be used as a supplement in a traditional face to face course.

Blackboard Inc., based in Washington, D.C. (Blackboard.com), was founded in 1997 with a vision to transform the Internet into a powerful online learning environment and be scalable for wider institutional applications. Blackboard's roots can be traced to a teaching and learning platform originally known as CourseInfo. The Blackboard CMS is known as The Blackboard Learning System ™ which was "developed to provide instructors and students with a feature-rich learning environment, pedagogical flexibility, complete control of the course design and unmatched ease of use" (Blackboard.com/highered, 2003).

Much research is currently being conducted on how to improve the learning process and how to measure outcomes. Many feel that CMSs can naturally enhance the learning process. The Blackboard Learning System ™ is currently in use at more than 2,000 academic institutions for online, Web-enhanced, or hybrid courses. The stated objectives of the System as presented on Blackboard.com are "to measure and improve student performance, increase instructor productivity, enable 'web-enhanced' classroom-based teaching and learning, deliver distance learning,

blend face-to-face and online learning techniques, leverage technology in order to enhance institutional competitiveness, and provide a framework for institutions to manage digital assets and content."

Blackboard.com indicates that the following utilities are available in the Blackboard Learning System ™:

- Content management and content sharing
- Asset Management
- Gradebook and assignment management
- Collaboration and communication
- Student and instructor portfolio management

In addition, for system administration, the following functions are also inherent in the System:

- Data management for student information, identity management and authentication systems
- System management utilities
- Standards, policies, and management for online courses
- Branding, system configuration and design
- Communications and calendaring functions

The main areas of emphasis in the system include collaboration, assessment and quizzes, course content and communications. Using the Internet as a medium, these areas can be combined to maximize student and instructor productivity. Organization of materials is achieved through the creation of folders and learning units, and instructors have the luxury of communicating with the entire class electronically through the Announcements feature. Messages can be posted and viewed at any time at any Internet-capable location. The Assessment Manager allows instructors to view areas of strength and weakness for each student. The Virtual Classroom feature enables student/instructor collaboration in both synchronous and asynchronous formats, and discussion threads can be archived and retrieved at later dates. The overall list of features and capabilities is very impressive.

Use of Blackboard in a Traditional Face-to-Face Course

The author of this paper uses the Blackboard Learning System™ as a supplement in a traditional face-to-face MBA information systems course entitled Information Systems for Managers. Since the MBA program at Duquesne's Graduate School of Business is predominately a part-time program that caters to working professionals, the Blackboard CMS is an ideal back-up support and communications tool. Students enrolled in the MBA program frequently have business and travel obligations that prevent them from attending every class. If the majority of required course material is posted on the Blackboard site, the material is readily accessible to a student who is unable to attend class. Of course the basic material is not enriched by class discussion that may have occurred. The site also provides access to fellow classmates via email and chat. Although the course is not designed for distance learning, the readily available course content allows the student to work more independently when the need arises. Blackboard provides a significant information resource enhancement to the traditional face-to-face nature of the course.

Following is a summary of Blackboard feature used for the MBA level Information Systems for Managers course as it is currently constructed.

Course Information: This section of the course website provides students with access to a PDF version of the course syllabus. All necessary contact information for the instructor and teaching assistant are included in the syllabus, as well as a detailed outline of course objectives and goals, student responsibilities, grading requirements, and course schedule. The syllabus is normally posted to the Blackboard site in advance of the start of the course to allow for student planning.

Course Documents: This section of the course website includes links to relevant PowerPoint slides grouped by chapter or lecture topic. Also in this section are the Sample Study Topics and Sample Exam Questions. These sections provide students with focused direction in the form of a study guide as they prepare for a mid-term and final exam. The majority of exam questions are modifications of the collection of questions made available to students. Links to required readings and cases can also be included in this section.

Class Email Addresses: This function of Blackboard serves to support the primary out-of-class communication among the students, faculty member, and teaching assistant. Each student is required to have a valid Duquesne University email address prior to gaining access to the course website, and students are encouraged to set up mail forwards if their Duquesne address is not their primary email address. Messages can be sent to all users, individuals, or select groups of students.

Digital Drop-Box: Students who wish to electronically submit course documents or assignments use this feature. The course administrator has access to all submissions, and students can submit as many documents as they wish. The documents remain in the drop-box until one of the course administrators removes them. The Digital Drop-Box is an added convenience to students who have periodical conflicts with the class time due to extenuating circumstances or travel obligations.

Online Gradebook: This feature of the course website allows students to check their grades periodically throughout the course. The gradebook area can be formatted in a weighted fashion in order to allow a tabulation of the student's weighted score at the conclusion of the course. The Information Systems for Managers course takes advantage of this capability. Course administrators have full access to all registered students' grades, whereas individual students can only view their own progress results as assigned to their user accounts.

Virtual Classroom: The virtual classroom feature allows students to enter a monitored online chat session to discuss class material. The instructor may use this feature in place of a face-to-face class session, or to supplement the existing coursework discussed in each class. The course administrators have the ability to focus students' discussions in specific areas or provide directions by acting as a forum moderator. All students wishing to participate in a chat session must be logged in to the course website concurrently.

Discussion Board: This feature is very similar to the Virtual Classroom, except discussions can take place asynchronously. Students can view and post messages as they see fit, and all class

members and instructors can view the postings. Course administrators can also create and maintain threaded discussions in order to facilitate the participation level of the students.

Conclusion

Course management systems are having a significant impact on teaching and learning. In many institutions, CMSs have been welcomed by both faculty and students because they serve to enhance teaching and improve learning. Course management systems possess the versatility to stand-alone for online education or serve as support tools for Web-enhanced or hybrid courses. The CMS serves as a great resource for organizing course materials and communicating with and among students. Students, obviously appreciate the opportunity to access course resources at their convenience. By its very nature, a course management system is a technology tool that supports and enhances the learning process.

The use of course management systems will continue to increase in the future. Demand for additional capabilities and functionality will likely make them larger, slower, and more costly (Carmean, 2003). There is a concern that as the systems grow, they will become cumbersome, time-consuming, and difficult to use. Most users feel that the systems should not demand significantly more time from students and faculty than a traditional course (Ibid.). Building more robust modules to address fundamental instructional design issues will be a great assist to faculty who lack instructional design expertise. Finally, to create an ideal learning environment, the needs of the student must be as important as those of the faculty in building a course. Students and faculty must be linked to best practices and resources for learning (Ibid.). As educators, we want more and better performance, but we fear the rising costs associated with added functionality.

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ResNet Program Automation
NetReg: A History of Hysteria

Jim Riggle
Michael Lavengood
Franklin College of Indiana
501 East Monroe Street
Indianapolis, IN 46201
317-738-8232
jriggle@franklincollege.edu

Abstract

This presentation will take you through Franklin College's process of automating the connection of student dorm rooms. We will show our humble beginnings with only a handful of students to our present state of over 500 students connected. We will demonstrate the different phases of development from manual installation to our new automated system which registers, enables billing for services, identifies and activates student ports without intervention.

Let us take you through our experiences, both failures and successes while creating this program.

September 1998: Franklin College Residential Networking Program (FC ResNet) consists of 7 dorms and 50 students connecting to the internet and network resources. All ports are active in all dorms as a student would never think of attaching a device to our network without asking permission. Besides they cannot connect without a network card. By the way, we sell and install those.

September 1999: FC ResNet doubles in size to 100 students. The IT staff believes that this computer thing is really going to take off with students. Estimated total of NIC cards needed for the 2000 – 2001 academic year is 300. Students begin to complain that their computers worked fine before "we" installed the NIC card.

September 2000: ResNet students again double; now 200 active connections. Manual billing is becoming difficult and students have brought computers to campus that are not registered. Need to begin looking at deactivating ports that are not in use.

September 2001: ResNet student count at 400, virus count on the network shares at 32,000, cost of anti-virus software $50.00 per person. Net Admin piece of mind… priceless.

September 2002: ResNet registration program on line for billing and port activation. Students now required to bring their computer CPU to "ResNet Ready Stations" to have anti-virus installed and have computer joined to the domain. ResNet student count for the year now at 500 computers connected.

September 2003: NetReg Automated ResNet system installed.

As you can see from our brief history of allowing students connection to the internet and network resources, the Franklin College IT staff has tried numerous methods to streamline the process. At one point during our "learning phase" we had students waiting for connection up to 45 days into the semester. Not something to be proud of but we learned much from our mistakes. We knew there had to be someway of automating this process so that our students could connect and we did not have to utilize 3 full time staff and 6 students.

NetReg

In October a colleague from Westmont College in Santa Barbara introduced a program to me called NetReg. NetReg, for those who have not heard about it, is an automated DHCP registration system. NetReg was designed at Southwestern University. It runs on basic Linux Red Hat and uses standard DCHP, Bind and Apache. This system answers DHCP requests from any subnet it is associated with. It checks an internal log for the MAC address of the DHCP request machine and if it finds it, NetReg will supply the machine with a valid network IP address. If the MAC address is not listed in the NetReg log it will give the machine a bogus address. All internet requests made from machines that have invalid IP addresses are redirected with bind to the NetReg registration page. The student then has the opportunity to register their computer and receive a valid IP address.

Although this process sounds fairly straightforward there are a few areas that need special attention. This is a description of how Franklin College integrated this system into our Windows 2000 Active Director environment.

Authentication

One of our biggest challenges was that the NetReg program requires a user to register with their user name and password. The program verifies this with your network and then allows or disallows registration based on authentication. We at Franklin College felt that any program capable of using LDAP should integrate with MS Windows Active Directory. This became a major stumbling block as we tried again and again to access AD through the NetReg program. Finally after weeks of searching an answer presented itself. It was not possible! At least not possible with the tools available to us now. Microsoft widely publicized Active Directory's ability to interface with other systems because it is uses or is based on standard LDAP. What Microsoft should say (and they do in the small print) is that you can interface AD with any standard LDAP as long as you have a developer using .Net technologies.

Although we do have a fine programmer/security administrator, there wasn't time to complete this phase and we opted for the FTP route. One of the great features of NetReg is that it offers you a variety of authentication methods. You can use a POP3, IMAP or FTP server to verify user names and passwords.

DHCP

Although not too difficult there were a few challenges configuring DHCP. First you must make sure that you separate the DHCP from other active subnets on your network. You do not want

the Linux/NetReg server providing IP addresses for everyone on campus. Second, it is a good idea that the invalid IP addresses is completely different from your regular subnet IP's. This will help avoid confusion when you are trying to identify a connection problem later.

BIND

BIND is a great tool and easy to use. It is no wonder why it surprised us when problems occurred. When setting your BIND configuration be careful and ensure that it is not dynamically updating and that you have told your real DNS server that BIND is a bogus server. BIND is really where much of the NetReg "magic" happens as it refers all but valid IP address back to itself as an authoritative DNS server. Once the NetReg server has registered a computer and issued a valid IP, DHCP all provides the proper DNS and gateway information.

NetReg Administrative Tools

NetReg logs all active registrations in a text file and allows you to view registered information such as user name and MAC address for each PC. Those who charge students separately for ResNet connection can export this file and use it for billing purposes. At Franklin College we added the student ID number to the registration criteria to make interface with our administrative software easier. This enables us to create an electronic billing file that can match and verify the student information in our Student Information System (SIS). This ensures correct billing to each student registered.

The administrative tools also allow you to view various information by subnet, users, and computers, providing you with useful information that is easy to obtain. The administrative tools are accessible from anywhere as they are completely web based and password protected.

Summary

With the NetReg system going live for the first time in September 2003 we are of course a little apprehensive. One piece of advice that will help you considerably is to set up a full test environment. This can be done by using Windows 2000 servers configured as routers and programmable hubs or switches. It allows you to test how the NetReg program will function in the real world application. The second piece of advice is to set your routers and switches separately so you can roll the project out subnet by subnet; testing each section as you go live. Doing so will help you avoid unanticipated problems be solving them one section at a time.

We in the IT Service department are very excited about this new venture. With proper implementation we look forward to this new system providing faster more reliable service to our students. What we hope to hear from the campus community will be; no more waiting in line… I just plugged in and the system worked. We will provide members of the conference with updates on how our rollout went. Hopefully everyone can learn from both our successes and mistakes.

Information Security Skills & Employers: A Study

Gary S. Rogers
Richard Spiers
Macon State College
100 College Dr.
Macon, GA 31206
478-471-2809
grogers@mail.maconstate.edu

The purpose of this study was to determine what specific skills employers wanted in graduates from Computer Science/Computer Information Systems/Information Technology graduates in a select group of firms in the greater Washington, DC area..

Target Population

The target population were technical managers at several firms in the greater Washington, DC area. This area was selected since the study author was familiar with this employment landscape.

Sample

The author of the study researcher sent the survey to 100% of the technical managers destined to receive the questionnaire. These were all technical managers who frequently are involved in hiring new college graduates. The sample is 24 (24 out of a total of 39) since that is the number of technical managers who responded to the survey. This is therefore a nonrandom sample.

Research Design

The research design used in this study was survey research, according to Leedy (1989). The advantage of this method is that it is a commonplace method for obtaining data beyond the physical reach of the observer. Since the author of this study resides now in Georgia, whereas the subjects live in the states of Virginia, Maryland and the District of Columbia, the survey method was the appropriate choice. Also, surveys can be reproduced and distributed simultaneously to many people relatively rapidly and inexpensively. This was excellent for this research in that it was simply too costly for the researcher to travel to all the subjects. Also, as Leedy (1985) states, surveys Aare sent to human beings...whom the researcher may never see@ (p. 135). Surveys also permit the subjects to answer around their work schedules. This fits in well in that the work hours of many technical staff are varied and unpredictable due a myriad of reasons.

Also, the survey is excellent in this case in that surveys are applicable when the author of the study does not see the source from which the data originate (Huberman & Miles, 1994). Since the author of the study was several hundred miles way from the subjects, relevancy was shown in this arena as well. In addition, the survey method was selected since it was impossible for the author of the study to control the interpretation of survey items, due to the long distances involved. A disadvantage of selecting the survey approach is that the descriptive survey method relies upon data that must be very carefully organized and presented to the subjects systematically; otherwise, it is difficult to draw accurate and valid conclusions. Also, too often surveys are

designed by well-meaning but nonscientific personnel; thus the surveys are weak in capability (Oppenheim, 1966, p. vii). Extreme care has been exercised in *this* study to address this issue by having multiple experts from differing backgrounds providing guidance in the design of the survey.

Data Gathering Procedures

In the period of October to November, 2002, a search was conducted to locate technical managers in the greater Washington, DC area who also are involved, in some manner, in hiring new college graduates in the CS/CIS/IT arena. Next, phone calls were placed to these points of contact to determine their willingness to participate in the study. The next step was the mailing of a survey package to these representatives. This survey package contained a cover letter, the survey, and a diskette containing an electronic copy (in ASCII format) of the survey. These surveys were mailed to survey participants in January, 2003. Phone calls were placed to assure delivery of the surveys, and periodic phone calls made until at least 60% of the surveys were returned. The subjects either returned the survey via the self-addressed stamped envelope provided (9 technical managers), provided survey information over the telephone person (7 program chairs) or e-mailed it back to the researcher (8 program chairs). It should be noted that at least 4 telephone calls were made to each subject not returning their respective survey. All surveys were then analyzed, and the results reported as per this document.

Instrumentation

The measurement instrument used for this study was a Security Skills Assessment Form as seen below:

SECURITY ASSESSMENT FORM

Please indicate *information security skills* you believe are desirable for recent CS/CIS/IT college graduates to possess. Please indicate as many as necessary:

Physical Security factors

Network Security
- Design methodologies
- Spoofing techniques
- Firewall analysis
- Firewall design
- Firewall testing
- Virus design
- Virus prevention
- Trojan design
- Trojan prevention
- Backdoors
- Others: please list

Data security (databases, etc.)

Social Engineering
- Dumpster Diving
- Password Protection
- Others: please list

Computer Forensics

Intrusion Detection Systems

Operating Systems:
- Windows 9x
- Windows 2000/XP
- Unix/Linux
- Others: please list

Information Security Costs

Information Security Planning

Cryptography

Shell Programming

Any other issues you may want to provide:

Related Items

Several survey participants provided detailed information on the skills they wanted, in some cases even delineating tool sets and learning strategies. These will be presented at the conference as well as the detailed results of this study.

Teaching a Class in Network Security

Gary S. Rogers
Richard Spiers
Macon State College
100 College Dr.
Macon, GA 31206
478-471-2809
grogers@mail.maconstate.edu

I propose to present the step-by-step process utilized to teach a junior-level class in Network Security.

Macon State College offers a Bachelor of Science in Information Technology degree. This has proven so successful that the program has increased from 50 students in the Fall of 1998 to over 900 now.

Matriculation through this degree program requires taking approximately 60 hours of introductory-level classes in web development, networking, programming, etc. in the Junior year. During the Senior year, students specialize in "tracks" such as Networking, Web Development, Programming, Database, Educational Technology, etc.

Due to recent geopolitical events and other factors, Macon State College has increased its offerings in the Network Security arena. Specifically, we have introduced a class in Network Security as a "Special Topics" class. After analysis of student participation and course success, it is expected to be made part of the regular Bachelor of Science curriculum, residing in the Networking track.

We have taught this class several tines, and students report they have learned a lot about network security and employers report more-knowledgeable employees in return.

The impetus for this class was due to a survey performed of IT employers which indicated a serious need for IT graduates with network security knowledge. In a survey of 24 employers, 100% indicated a need for IT graduates to have these requisite skills. Specifically, they wanted IT graduates with skills in designing and implementing firewalls, fundamentals on cryptography, knowledge about how hackers invade a network and how to prevent this illegal process. In addition, employers, even those with non-Unix networks, wanted IT graduates to have a solid knowledgebase in Unix/Linux.

This is a brief overview of the course:

How Hackers conduct Reconnaissance on your Network

Searching the Fine Web (STFW) – discovering info about organizations by searching their websites.
Whois databases & the Domain Name System

War dialing
Demon dialing
Finding live hosts
Open ports
Tools: Sam Spade, L0pht, THC-Scan, Nmap & others
Defenses

How Hackers Gain Access to your Network

Script Kiddies
Stack Overflow Attacks
Password Attacks
Web Application Attacks
Sniffing a Network
IP Address Spoofing
Tools: Netcat & Other Tools
Defenses

How Hackers cover their Tracks & Hide

Altering event logs
Creating difficult to find Files & Directories
Defenses

I propose to use my laptop to lead session participants in a step-by-step process of how this class was conducted. We will look into networks on the Web and discover valuable information via the use of multiple tools.

Building a Blended Technology Family: A Call for Action

Patti Ross
Associate Dean Information Technology
ross@edisonohio.edu
937-778-7887
Dennis Myers
Vice President Information Technology
myers@edisonohio.edu
937-778-7878
Office of Information Technology Services
Edison Community College
1973 Edison Drive
Piqua, Ohio 45356

Abstract

Edison Community College has taken the bold step of integrating the roles of Information Technology practitioners and faculty into a new organizational structure that creates synergy and a more positive relationship between the IT practitioners and learning leaders. Practitioners graduate from the various programs and, while performing their jobs, teach as adjunct instructors, bringing valuable on-the-job insights into the classroom environment. The practitioners also offer internal training on tools that are used in the classroom and administrative offices such as Blackboard, Web Advisor, VoIP phones, administrative software and the IT infrastructure used by the institution. Faculty combine their knowledge of teaching, learning styles, classroom management, assessment and content with IT practitioners who are implementing state of the art teaching tools. The college finds that the new organization creates an atmosphere of emphasis on improvement that fits perfectly with its Continuous Quality Improvement and Servant Leadership initiatives.

Introduction

Four years ago Cornelius Pings, past president of the Association of American Universities, wrote that "The explosive development of digital technology has engaged every sector of the academic community, but the future impact of the technology will be even more sweeping. Digital information technology will profoundly influence the production, dissemination, and management of information; its impact may affect the structure, operation, and governance of the higher education enterprise as well" (1998, p.viii). His cautious observation of the effect of the new technology may seem to be a serious understatement against the backdrop of today's campus communities.

Edison Community College marked recognition of this profound change when in August 2000, its president, Dr. Kenneth Yowell, created a cabinet-level position to "…lead and manage the Information Technology Services staff in providing technology services to students, staff, and faculty, as well as foster a culture of customer service" (2000, p. 1). In two years time the Office of Information Technology Services has brought sweeping change to the processes of acquiring, provisioning, and managing of information technology services. More significantly, the office

now leads the strategic planning process for transitioning from centuries-old pedagogical methodologies to those emerging at the dawn of the 21st Century. It has done so by creating a synergistic and ongoing dialogue between academic specialists and IT practitioners. Faculty combine their knowledge of teaching, learning styles, classroom management, assessment and content with IT practitioners who are implementing state of the art teaching tools. Meanwhile, I.T.S. practitioners not only support online and distance course management, they help lead its adoption. Grant funding opportunities are now frequently begun and led from the I.T.S. office, regional inter-institutional alliances are maintained and nurtured under I.T.S. oversight, and anecdotal evidence points to a sharp and significant improvement in customer service levels.

Realignment of IT Academic Programs and Practitioners

Prior to the gains made by the new I.T.S. organization, the delivery of information technology training and credit courses at Edison had shown a trend-line of stagnancy and decline. This had occurred despite a shortage of IT workers in the U.S. estimated at "hundreds of thousands" by Aspray and Freeman (2002, p. 12). Why the disparity between a growing need for IT workers and the apparent lack of demand for the training of these workers in the Edison service area? Was it a cyclical decline or the result of the pedagogical model which was in use?

Though we do not know with certainty the causes of that stagnation, some suggest that the problem lies in the use of a traditional model for a curricular area that has a different set of skills needs as compared to most traditional academic areas. Neil Evans, executive director of the National Workforce Center for Emerging Technologies, outlines an IT skills pyramid that recognizes a need for three tiers of skill building curriculum for IT workers (2002, pp 28-29). The first tier, and that which is most comfortable within traditional academic communities, is that of foundation and employability skills (our general education courses), the second is that of technical skills (our academic IT courses), and the third is that of industry-specific skills (Microsoft and Cisco courses). It is at the third level that the traditional model begins to lose efficacy for preparing IT workers, for it is at this level that certification skills that are recognized by employers need to be led in an aggressive and unrelenting manner. It is in this area that a passion for the technology must not only be displayed, but also be deeply ingrained in the practitioner/learning leader and administrator, for change in information technology is also aggressive and unrelenting.

Additionally, the practitioner, always in need of perceiving the relentless, pervasive change of information technology, becomes the natural environmental scanner, always on the lookout for programmatic opportunities. This attribute alone could justify a shift in organizational structure as the need to overcome evolutionary change mandates new programs to replace those that have become outdated.

There are close analogies to this perceived need for a practitioner/learning leader model. Medical certifications are achieved after a close collaboration between the practitioner of medical services and the medical school student. At Edison the synergy of collaboration between the childcare center and the early childhood education curriculum has long been recognized and practiced.

Beyond the potential for more students in IT course delivery is the likelihood of producing a ready supply of well trained, certified, and Edison-knowledgeable IT workers. Many of Edison's current IT staff are products of Edison's academic and IT training programs. The track that leads from student to student intern to part-time employee and ultimately to a permanent IT position is well trod. This was particularly apparent during the time when a full-time faculty member led both the Internet Technologies academic program and the Edison Web site initiative.

It is a model that would likely resonate quite well within current scholarly research for as Aspray and Freeman observe: "Traditionally, higher education models served as the basis for one's career, although some of the larger IT companies had training programs for their employees. Today, higher education is an entry ramp into a job, but it is not expected to carry one through a career. Taking advantage of on-the-job experience and various kinds of continuing education, the IT employee is today expected to engage in a life-long retraining effort, which is intended to keep the worker up to date in this rapidly changing field" (2002, p. 10).

Would Edison set in place an educational model that self perpetuates itself, that is, the student becomes the IT worker who trains others while continuing to be a student? Without the typical organizational constraints, our new organizational model was in place in 2002.

But did those constraints need to exist? It was the perception of the authors that the answer was no. Aside from the ongoing need for coordination between the IT and academic units of the college, there is the additional need for a moderate level of academic oversight, and that need could be met by the ITS administration. Coordination could easily be achieved through the establishment of joint meetings of the Deans' Council and the I.T.S. Council on a biweekly or monthly basis. And, where needed, current academic oversight practices could be replicated within the Office of I.T.S.

Realignment of Academic Support Services

The I.T.S. Applications Services unit has dramatically increased its work output to meet the need for the support of online, distance, and blended courses, as well as online testing concurrently. The faculty support organization has been carrying out its traditional processes of creating paper documents and tests, providing instructor textbooks and other classroom materials, and coordinating faculty/student scheduling. Whether or not this faculty support function was decreasing in volume or importance, the certainty was that the new technology was creating the need to lessen the existence of organizational "silos" that deter or delay the reassignment of support workers to areas of greater need. As an example, over two thousand students and more than one hundred faculty members utilized the Blackboard course management system during the fall semester, yet little support resource balancing was possible within the then-existing organizational structure. Time that ITS leaders could be spending toward helping develop faculty skills was instead being spent entering student names, login IDs, and passwords. Under a unified support services organization this highly clerical function was reassigned to data input personnel thus releasing ITS leaders to higher-level functions.

Likewise, while concern existed for the oversight of quality in instruction, academic leaders were burdened with the administration of the Faculty Support, Library, Learning Center and Recep-

tionist support functions. Just as the need existed to create new functional units for the purpose of releasing ITS leaders to higher-level functions, so, too, the academic leaders needed to be released to perform the more important higher-level functions of program development and faculty leadership.

In a broader context, the improved technology has created new synergies that make new alliances between traditional information sourcing units and those that manage the delivery of information of particular value to learners. Various studies and real-world implementations have demonstrated that it is now prudent to merge oversight of the library function into the IT organization. In Ohio, Kenyon College created such an environment in the early '90s and it has since dictated the design of campus facilities. There the flow of information from the search for information sources to the delivery of the information to the consumer appears to be seamless. According to Richard Bazillion, Dean of Library and Information Services at Winona State University "The arrival of electronic information products doesn't mean an end to libraries as institutions, although a new kind of library service is certainly evolving" (2001, p. 53).

Information literacy is now assumed to include both the ability to find information and also to make the information useful through technology. Carol Barone and others spoke to this need in 2000: "Librarians are struggling to augment print publications with appropriate electronic sources and to develop new electronic archiving schemes. Large digital library projects, such as the California Digital Library, are often operated as regional consortia outside the normal library framework to permit the structural, economic, and organizational freedom to experiment with new forms of information and new forms of access to it. Librarians in the future will focus organizing, defining, and bounding the masses of information available on the Internet. A new information resource profession combining the technical knowledge of the information technologist with the information organization expertise of the librarian is emerging, (2000, p. 31)"

Why did we see a need for change?

We strive to make Edison a leader of technology and learning. What we saw before the summer of 2000 was that compartmentalization fostered competition, system breakdowns, rivalries, and misunderstandings; it did not foster dialog. Without that dialog, we could not grow as a leader of technology and learning.

Building our "Blended Technology Family" has required a cultural change. From the traditional model to one of Learn, Lead and Serve. Our involvement and study of Continuous Quality Improvement (CQI), our North Central Accreditation process, Academic Quality Improvement Process (AQIP) and Servant Leadership have all helped in the transformation. Our departmental mission places a strong emphasis on customer service. The mission is clearly defined and it is service based. The V.P. of Information Technology Services has been charged with creating this new environment of service. The ITS motto is "IT'S all about you!" and the entire department performs in a "customer first: mode. New ways of organizing based on Servant Leadership have begun to effect the whole institution. We are beginning to see the amelioration of "us vs. them" attitudes. This strong service orientation encouraged Edison to change its organizational structure.

Edison Community College Organizational Model For the 2003-2004 Academic Year	
V.P. for Education	**V.P. for ITS**
(Delivery of Education)	(Learning Support)
Faculty (including IT faculty academic quality oversight)	IT faculty (including IT curriculum development)
Curriculum development	Grant acquisition planning
Student development/services	Library, Learning Center, and Internet Cafe
Assessment	Faculty support
Academic concerns: • Delivery options: Flex, Web flex, Online, Traditional • Teaching tools using technology	IT client services
	IT core services: • Data, voice, video and image systems
	Application Services
Classroom management	Testing center
Using administrative software • Degree audit, class rosters, grades, etc.	Administrative computing • Interactive student information systems • Business continuance planning

We confront and overcome barriers with the implementation of cross-functional CQI process improvement teams. After working together in these teams, employees from all departments have a better understanding of processes and what their part in the process is. Today, our active ITS related teams are, Outlook E-mail and Exchange support, Academic lab deployment, ITS customer service, online course support, and the Online Academic Design team.

Three critical teams were formed and are now operating successfully: Edison Technology Committee (ETC), Academic User's Group (AUG) which monitors the Computer Replacement Fund (CRF) and the Administrative User's Group. These are all cross-functional teams that meet to develop strategic initiatives and tactical plans. We decide as a whole what is best for the college, not each department.

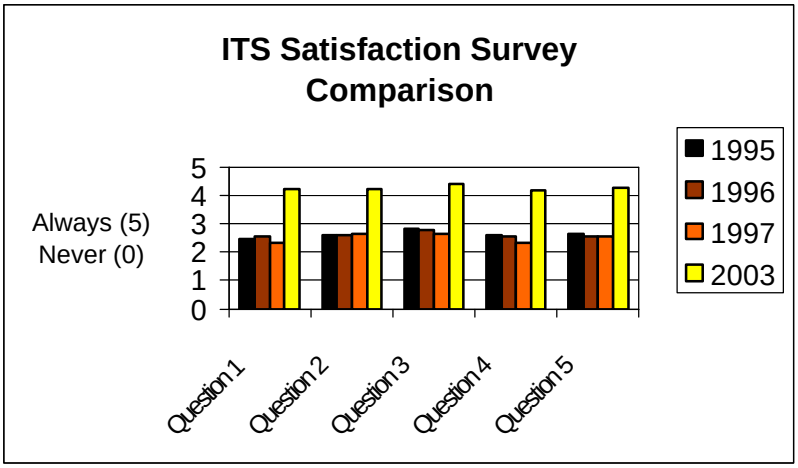
As an example, a technology fee is charged each student in courses meeting in computer labs and the revenue generated by this fee is put into the CRF. The AUG, whose members represent all academically oriented departments in the college, decides collectively the best way to spend that revenue. Decisions are influenced by student and learning needs as interpreted by the faculty, deans, and academic leadership as well as by the practical limitations, capacity building, and technical knowledge of IT professionals.

Additional collaboration also takes place between the IT faculty and IT staff. A series of meetings have led to improvements in the delivery of IT courses critical to the success of our students. Our courses for A+ certification and credit courses for operating systems and hardware have been streamlined and improved by this close collaboration. Higher levels of respect be-

tween academic professionals and IT professionals appear to result from these successful collaborative efforts.

How do we measure success?

We have compared historical data from our annual institutional survey. We began to work toward a change of culture during the summer of 2000. Our survey shows drastic improvement in each of the five areas surveyed.



Responds promptly to requests (Question 1)

The hotline number, 711, created in 2001, provides users direct access to assistance from our Help Desk. We have seen great reductions in the number of 711 calls. Calls are now placed more often for support and training than for "trouble." The initiative to replace outdated computers and peripherals utilizing the funds earmarked from the CRF, standardizing faculty office computers, placing the same equipment in both office and classroom, making every classroom "Smart", and, finally, offering training and instruction on new equipment, have drastically reduced trouble calls. Two years ago, it was not uncommon to have 25 to 30 Help Desk calls per day, today we average 3.

Comments from Edison employees:

"We have a system in place, as well as adequate staffing and expertise to support all requests on a timely basis."

"Any time I've requested assistance, I have always received a reply and usually a visit from someone in ITS."

"Response time is usually measured in minutes."

"We have experienced very timely responses."

"The help line is always answered promptly. Generally the follow-up is prompt and the problem is addressed. Professional staff members of the department give prompt and effective help when contacted directly."

Provides accurate information (Question 2)

Training is provided by both faculty and Application Services through scheduled in-house courses and individual office visits. Training manuals have been placed on our network in Public Folders. Whenever new technology is introduced on campus, training courses are scheduled and manuals developed.

Comments from Edison employees:
"Troubleshooting and assistance is provided and worked through until resolution in a timely basis."
"The personnel from ITS have always been able to "fix" any problem I've encountered. If the first person who responded was unable to find the solution, he/she called a co-worker for backup."
"Problems are always explained in detail in understandable terms."
"We all benefit greatly from the knowledge and experience in this department."
"ITS department is Great."

Exhibits helpfulness and courtesy (Question 3)

One of our goals is the practice of outstanding customer service and our motto is, "I.T.'S. It's all about you!"

Comments from Edison employees:
"All members of the ITS staff are cordial, prompt and professional. Our system has improved to the point that there is a higher morale and self-respect."
"Not only are the staff from ITS helpful and courteous, they all have a wonderful sense of humor and do not make those of us who are a bit "computer challenged" feel as though we are being a bother."
"(ITS network manager)… is a genius!"
"A very professional, supportive bunch!"
"The entire IT department is helpful and courteous especially …(ITS technicians.)"

Demonstrates flexibility (Question 4)

IT professionals know the challenges of keeping up with technology, trying to keep projects on target, and responding to the daily challenges of keeping an enterprise up and running. We strive daily to juggle all three.

Comments from Edison employees:
"My experience with the personnel from ITS is that they spend as much time as it takes to get the job done regardless of their own agenda."
"Most people in the ITS department can juggle more then one thing."
"They are the best..."

Performs functions effectively (Question 5)

The IT functions at Edison have improved through an emphasis on employee service attitudes, hiring service-oriented professionals, and by constantly balancing client needs with the best match of IT professionals' skills to client needs. Better service levels have been achieved without dramatically increased expenditures.

Comments from Edison employees:
"As an employee who just had their hard drive rebuilt, I couldn't be happier. With all the upgrades and programs to reconfigure, everything is working perfectly and speedily."
"Great team to work with."
"Nobody's perfect--this department makes a close approach!"
"Nothing short of being the best for ITS"
"Absolutely wonderful."

In addition to ITS areas already discussed, Application Services has contributed greatly to the success of changing the attitudes toward education and learning with technology. The unit has used technology to blend the conventional classroom delivery to that of online learning. Training and in-house support is available to give instructors the tools and the instructional ideas they need to produce a quality in the learning environment. The goal of the Application Services team is to empower the employee and student population with the knowledge and skills necessary to succeed.

The members of all of our IT teams, our IT practitioners, often graduate from our programs and, while performing their jobs, teach as adjunct instructors, bringing valuable on-the-job insights into the classroom environment. The practitioners also offer internal training on tools that are used in the classroom and administrative offices such as Blackboard, Web Advisor, VoIP phones, Polycom, and administrative software.

We believe that the better scores on our annual institutional assessment can be attributed to our effort toward changing our college culture. We work hard to encourage collaborative efforts and we're proud of our success. For example:

Our Faculty Support office provides online testing support for faculty, and posts all syllabi to the Public Folders that are maintained by the Applications support team. A faculty member brought two proposals to the ETC. One for a Wireless Zone and another for Interactive Video; both were approved, implemented by ITS and used by all. Another faculty member worked with vendors, the Learning center, Student Services, Bursar, Registrar and ITS to develop a college-wide testing center.

The Future of IT at Edison

The Edison Technology Committee, recognizing the need for combining the new technology with information organizing and sourcing expertise, recommended in March 2002 the formation of a Center for Student Learning. Conceptually, the ETC plan calls for the creation of a "virtual" center housed in multiple current venues that will ultimately lead to the creation of a "real" and

unified center at a future date. This concept has recently driven strategic planning at the college toward a capital campaign aimed at funding a building renovation and expansion project to house the center, as well as that of a center for IT learning and business and Industry training. Since planning for the new center is in the formative stage, the realignment of functions at the college will positively affect the need for comprehensive planning efforts.

Conclusion:

In 2002 Hawkins and Marcums' made the observation that "…it is important for information resource and technology leaders to articulate the risk, the alternatives, and the consequences of inaction as they define a direction for the campus" (2002, pp. 134-135). We at Edison believe that there was little risk in implementing a functional realignment yet there existed the potential for huge gains if the model does indeed work. However, we are more cautious in accepting the Hawkins and Marcums observation that "To do this requires the leader to have one managerial attribute that is scarce on college and university campuses today: courage." It is certain that it does require that the academic leader have vision.

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How *YOU* Say and Write it; How *I* Say and Write It
Using Technology to Teaching Writing for Global Communication

Janet Seggern
Linda Novak
Lehigh Carbon Community College
4525 Education Park Drive
Schnecksville, PA 18078
610-799-1595 (Seggern)
610-799-1937 (Novak)
jseggern@lccc.edu
lnovak@lccc.edu

One day I came across the comic strip, For Better or Worse (Johnston 2003) that dealt with a daughter insulting her mother because she was technologically "impaired." It initiated thoughts of how technological communication, particularly e-mail and text messaging on phones is changing language—changing it for the worse. As I watch the deterioration of language in my classroom, I'm thinking more and more that they are victims of a changing world and many don't realize it's even happening. This deterioration is warping communication not only in the classroom, but with some educated colleagues as well; witnessed through an e-mail that began "how r u . . . ."

Devolution of Language

In a fast-paced world, people seem to be looking for a faster way to communicate. Trying to teach formal writing in business letters and memos seems to be getting more difficult. Students who once asked, "Why should I write when I can call?", are being replaced by students who ask, "Why should I write formally, when I can e-mail?"! This became even clearer when I asked a colleague if I should send a letter or memo to the Director of Human Resources in order to compliment one of the secretaries for doing an outstanding job beyond that of her job description. I wanted a record of the communication in her personnel folder. My colleague responded that I should e-mail the Director since she never reads "hard copy".

Technology's Effect on Communication

While we may not think of the telegraph or television as being part of a national communication system, those inventions created change in the way people communicated in the 19th and 20th centuries. Perhaps the Internet should be hailed as the first instance of a true global communication system which would involve a revamping and/or displacing a national system into an international communication system in the 20th and 21st centuries. This change in communications over the last three centuries alters physical, symbolic, and media ecologies (Carey 1998).

The fast-paced world also is the shrinking world of global communications. Today's (and tomorrow's) technology allows us to do business or chat with colleagues and friends anywhere in the world. The low cost and ease of use of e-mail, cell phones, instant messaging, and the Internet help to promote this type of communication. Today's salesperson is a far cry from the drummer

who carried his sample case from company to company trying to make a sale. The speed with which information can flow between buyer and seller makes today's accountant stop and ponder the expense of an actual sales call versus an e-sales call.

For example, at this moment many companies are restricting any travel to Hong Kong due to the outbreak of SARS (Bradsher 2003). However, many U.S. companies rely on Hong Kong manufacturers to stay in business. The buying trip that previously involved actually going to Hong Kong and meeting with the manufacturer can now be done using two-way audio/video from the comfort of your home or office—without the possibility of communicable diseases spreading.

Yet, something is lost in the change from in-person to electronic selling. Both parties now have limited time and resources with which to establish their business relationship. Time needed to haggle over pricing or explain unique terms or ideas may not be available. The personal touch of closing the deal with a handshake or bow may be lost. Poor connections or rudimentary equipment may doom the transaction.

The clash of culture and technology is illustrated by the case of an American firm investing in videoconferencing facilities for use in its Thailand subsidiary. Planners thought this would increase productivity by eliminating the need for remote site mangers to spend an entire day traveling to attend a meeting in Bangkok. Soon the American director of the Bangkok office found that the managers were staging videoconferences for his benefit and secretely meeting face-to-face afterwards as they still wanted to be able to meet in person to gauge the reaction of others (Gundling 1999).

The Personal Touch

Building trust in relationships can become hindered though electronic communications. Although technology has opened the global market, verbal messages, tone, body language, and gestures is lost. These non-verbal clues are often helpful, since this is as much a part of the language as the written word. In addition, psychological distance is reduced between people who work together. E-mail or text/instant messaging has replaced walking down the hall to speak to someone. Today's workers sit side-by-side in their cubicles yet communicate via e-mail.

A recent editorial by Renee A. James coins the word "typediss" to describe the practice of typing and communicating with someone else simultaneously. It's hearing that tap-tap-tap as you converse on the telephone—the person on the other end is multi-tasking (James 2003).

I'm certainly not negating the benefit of the speed of e-mail and text messaging—we certainly are living in an instant-feedback world—I'm just worried about the sanctity of language. Since every other person one sees is talking on a cell phone or e-mailing a friend, this trend of short-cutting language is seeping into the more normal, refined world of language. Making the switch between the undisciplined habits among youth from the mall to the classroom is only going to become more difficult—if I'm seeing it in class writing, other teachers must be also. Whether it's students writing or speaking, the change has arrived.

In Speech classes, it takes days for me to clarify the difference between informal and formal speech. Students argue and say there's no difference; "Dat's how dey tawk on TV", and "Dat's how me an my friends tawk" pervades our class discussion. Foreign students look blankly at me, when students slaughter their speech with idiomatic, cliché speech. They want to know why they haven't learned this English yet (Cheney 2001). This linguistic decay now invades my writing classes; "This is how my friends write it" is not the discussion.

Let's face it, technological communication is on the rise. According to the Cellular Telecommunications Internet Association, in June 2001, 30 million text messages were sent in the U.S.; by June 2002, that number increased by nearly 1 billion. In Germany, 10 billion text messages are sent each month (Holmes 2003). What will June 2003 bring?

A Look at the Technology

The number one selling speech recognition software, Dragon NaturallySpeaking allows users to select their preferred language or accent for use with the program (Scansoft 2003). IBM's speech recognition software is available for speakers of many languages. The software is able to be used on PCs and MACs as well as notebook/laptop/tablets (IBM ViaVoice 2003).

The installation of speech recognition software is also available for handheld computers (pocket PCs or Ipaqs). A new development allows the user of IBM ViaVoice, in addition to being able to dictate to the handheld computer, to also use the handheld computer for translation. The user purchases additional modules that perform translation to/from English, Spanish, French, German, and Italian. The translation can be accomplished by speaking to the handheld and viewing the translation on the screen. Or, the user can speak or write to the handheld and have the translated words "spoken" back to aid in pronunciation (IBM Via Voice 2003).

A sampling of the range of languages/accents available with speech recognition and translation software is: Japanese, Chinese, Arabic, Français, Deutsch, Italiano, Español, UK English, English, Português, Indian English, Australian English, SE Asian English (IBM ViaVoice 2003, Scansoft 2003, Speaking Solutions, Inc. 2003).

A prepackaged feature of Office XP allows users (who have the proper language dictionaries installed) to translate while working in the software. More lengthy or complex translations can be done using the Microsoft web site which is partnered with Browne Global Solutions, a professional translation service (Microsoft 2003). Other such web sites exist for free translation services, such as Babel Fish, or fee-based services (Babel 2003). Microsoft cautions users that important documents, such as legal documents, should be reviewed by a professional translator; the computer software cannot always capture the context of the message for accurate translation (Microsoft 2003).

Intercultural Implications

As this linguistic abyss continues, global communication will also have a breakdown. When American e-mail is read in Japan, and is translated, the Japanese will soon be asking if there is a new language in America, because they will have no idea what we're talking about.

While translation software and professionals will ease global communications, the value of translating in context and of using localization when translating may mean the difference of being understood (Gundling 1999; Flint, Lord van Slyke, Starke-Meyerring, & Thompson 1999). Grundling posits that the higher level of rapport of communicators the lower the level of context required (Grundling 1999). This restates the high-tech, high-touch movement in business in the 1970s.

Another option is to utilize native and non-native students in the classroom to explore cultural and communication differences (Cheney 2001). Something most people view as straightforward, a business letter, has significant differences amongst different cultures (dos Santos 2002). Exploring the similarities and difference of a culture's communication style can decrease the level of ethnocentricity when communicating.

When combining communication and technology, consider these factors: Availability of technology, user skills, cultural variables, level of rapport, importance of the message, ways to build context, regular patterns, language modification, time differences, and user choices/preferences (Gundling 1999).

While we Americans think that the cell phone has revolutionized our lives, both personal and business, other countries have already taken the technology to the next step. Imagine standing in front of a vending machine in Singapore and dialing your cell phone to make a selection (Beaubrun & Pierre 2001); now imagine the Singapore traveler in the U.S. trying to do the same. Many cultures are adopting the idea that an electronic device should be useful for more than one task, and, subsequently, many people have adapted their way of life to using that electronic technology. Conversely, others (both in the U.S. and abroad) have little access to technology due to economic or geographic concerns and cannot become players in this new e-tools arena (Beaubrun & Pierre 2001).

E-lingo

Remember being a child and writing SWAK on the back on an envelope and thinking no one else would be able to decode your mysterious message. Are we really that old!

Let's take a look at some of the current trends in abbreviations:

AFAIK	As far as I know	LOL	laugh out loud
B/W	Between	SOL	sooner or later/sadly out of luck
B4	Before	TIA	thanks in advance
BBL	Be back later	TMI	too much information
BRB	Be right back	TTFN	Ta-ta for now
BTW	By the way	TTYL	talk to you later
FYI	for your information	TTYS	talk to you soon
G2G	got to go	UR	you are
IMHO	In my humble opinion	WL	Will

If your friend doesn't understand your cryptic message, it's simple; he or she merely says "W" (What?) or "PXT" (please explain that). Many of these phrases are uniquely North American; how will the communication be understood by the receiver in China? Poland? Soon society may have to start thinking of communications technology as one of the new world languages.

The old theory of "if you can't beat them, join them" is displayed in the classrooms of a middle school in New York's Chinatown. Instructor's realized that students were using the tools and e-lingo of instant/text messaging, chat rooms, and e-mail as a means not only to communicate but to also establish cultural identities. Teachers realized they had to work from within the student's frame of reference to connect their school print-based literacy initiatives to their chat room conversations and other electronic communication (Albright & Purohit, 2001).

Where Do We Go From Here?

Maybe I should just be happy that people are writing and accept the advance of new technology in communication. I'm not a linguistic purist, I just long for the good old days.

After all, as with changes in language and technology in the past:

- Many kids will tire of it.
- The trend will pass.
- Maybe it encourages people to write.
- It's easier for people to communicate.

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The Gordian Puzzle: Logical Approaches for Multidimensional Faculty Participation in Innovations with Technology

Carol Smith
Bruce Serlin
DePauw University
Greencastle, IN 46135
Alex Wirth-Cauchon
Midwest Instructional Technology Center
Ann Arbor, MI
765-658-4287
clsmith@depauw.edu

Abstract

Opportunities for effective innovations in teaching and learning using instructional technology abound. Some faculty members eagerly adopt and integrate these innovations in their courses, while others are cautious, exploring only those strategies already proven successful by colleagues. Still others are resistant, refusing to use technology-related methods at all. Further, the support each instructor needs is unique and defined by several variables, including the discipline being taught, the instructor's personal teaching style, and his/her comfort level and skills with using technology. The result presents a complexity of challenges to those of us responsible for defining, developing and delivering instructional technology (IT) support and services for faculty. How do we untangle the knot?

In this paper, we will examine the keys to finding solutions from multiple perspectives. A faculty member, the director for a university's faculty IT support program, and the administrator of a consortial center that facilitates cross-institutional faculty IT projects will share their experiences in IT support, viewpoints on what succeeds and what does not, and generate a conversation about where institutions might best focus energies.

Note: This session is a panel discussion and no paper will be provided. The authors may provide handouts at the conference either directly or via the web or email.

"On-Time Grants for On-Time Technology in the Classroom"

Richard N. Stewart
Associate Professor, Communications and Parish Administration
Lutheran Theological Seminary at Philadelphia
Director of Distance Education – Eastern Cluster of Lutheran Seminaries
Philadelphia, PA 19119
215-248-6378
rstewart@ltsp.edu

Abstract

In a review of the technological developments at the Lutheran Theological Seminary at Philadelphia and the Easter Cluster of Lutheran Seminaries, attention will be given to the four grants received by the Seminary which has facilitated the use of technology in the classroom. In almost each instance the institution had done sufficient pre-work to be in a position to receive the grant as an on-time facilitation of work that had been expected to take place. The grants moved the process at an accelerated pace.

The question can be raised as to whether the grants were targeted to facilitate the growth in the use of technology, or whether there was a chance relationship between the desires of the institution and the goals of the granting agency. The presentation will look at the motives, the process, and the results of our grants and their applications.

Background

The Lutheran Theological Seminary at Philadelphia is one of eight seminaries of the Evangelical Lutheran Church in American whose mission is to teach and prepare professional and lay leaders for the church. The church has divided these eight seminaries into three clusters: The Western Mission Cluster [Pacific Lutheran Seminary - Berkeley, and Luther Seminary - St. Paul]; Covenant Cluster [Wartburg Seminary - Dubuque, Lutheran School of Theology at Chicago, Trinity Lutheran Seminary – Columbus]; and the Eastern Cluster of Lutheran Seminaries [Lutheran Theological Southern Seminary – Columbia, SC, Lutheran Theological Seminary at Gettysburg, and Lutheran Theological Seminary at Philadelphia].

In 1994, I made a presentation at ASCUE, which highlighted the historical process by which the Lutheran Theological Seminary at Philadelphia [LTSP] became computerized. The struggle of staff to keep up with a growing list of contributors led to the first purchase of a computer for the development office in 1984. The first grant came in 1985 from the Prosser Foundation to subsidize the purchase of computers by faculty. The grants provided $500 for each faculty computer. You might remember them, IBM based computers with dual floppy 5-1/4 in drives, and of course monochrome monitors. With occasional institutional purchases for the faculty secretary and the admissions office, computerization seemed to stand still until 1989.

I wish that I could say that my arrival in 1989 was the cause for the change, but it really revolved around a gift received at the seminary from employees of the IBM Corporation. The seminary benefited from a matching grant from the IBM Corporation. The grant offered a one to one match for desktop PC's or a four to one match for institutions seeking a mini-computer. LTSP

found itself trying to make a decision about the risk of committing to a system administrator for a networked environment with a mini-computer or number of stand alone personal computers. I was way to new to risk placing the Administrators responsibility in my hands.

We knew that we were not operating in a solo vacuum. The eight other seminaries in the Evangelical Lutheran Church in America were facing similar challenges for growth in technology, but few new resources to meet this growing need. Within the first year I wrote a grant proposal to the Lutheran Brotherhood [now Thrivent] seeking support for a student oriented computer laboratory. I also had plans for continuing education for church secretaries and office administrators at this beginning stage of church computerization. I was informed that they did not fund computers. I did not know about a common piece of information in the grant seeking process; know what your benefactor does fund.

As the church was concerned about the growth and use of technology in its eight seminaries, they called together those of us who had been identified as the technological leaders on our campuses. We gathered each summer to look at church wide expectations and our capability to meet those expectations. At the same time the church was studying the whole field of theological education and the task force gave an early glimpse of their 1993 findings, which encouraged the seminaries to use distance learning to create a curriculum which would meet the first year of studies for incoming students. This goal had no funding attached.

In a public relations piece from one of the sister seminaries, I learned that one of the seminaries, close to the headquarters, had received a grant from the Lutheran Brotherhood [now Thrivent] for student computer laboratories. Upon writing to see if they had changed their criteria, I was informed that my proposal was overly ambitious and that I did not limit the use of the computers to seminary students on campus. I learn a second lesson in the grant seeking process, talk to your benefactor about your needs and their giving patterns.

Then in 1993, after some mutual conversations, our national church office and three seminaries in the Midwest purchased video conference equipment and began to talk about the possibility of offering mutual courses to their three campuses. It became very apparent that there was a major difference in the funds available for experimentation amoung our sister seminaries. Our president in a casual conversation with an alumnus spoke of the plight of LTSP being economically able to keep up with three of the other seminaries.

This particular alumnus had access to an endowment and the congregation had a mandate to assist with theological education, and they were interested in educational offerings for the members of their congregations. With a significant interest in our progress, the church granted the seminary $500,000 to fund a video conference classroom and fund the staff needed to address this addition and to maintain the equipment. The congregation did this for two seminaries in Pennsylvania and kept a like amount for the congregation to build a studio in their building so that they might be an off-site educational facility. So in 1996 I was informed that I had access to start designing a high tech, videoconference classroom.

The challenge was to develop a learning curve on a new technology in the midst of completing the tasks already the responsibility of a solo part-time Information Technology staff member

[me]. Though the leadership of the seminary was a supportive and enthusiastic supporter, no one had previously had any experience in using the equipment for educational delivery or even being a student in a distance learning environment. It became very apparent that we needed to do some significant homework to make good use of this gift to the seminary.

Having watched one of sister seminaries be an early implementer, I learned that a grantor could be found to support the study of how an educational delivery system could and would be used. Once again in conversation with Lutheran Brotherhood [now Thrivent], I noted that the seminaries were not playing on a level playing field, when it came to the benevolent resources of LB. I wanted to know how they could help the seminaries of the east coast develop their own version of educational modeling to meet the expectations of the church and the needs of the people we are called to serve.

By 1999 we had generated significant interest to receive a $50,000 grant to explore how technology would be used to deliver educational offerings to the Eastern Regions of the Evangelical Lutheran Church in America. This grant generated a gathering of 125 participants to share the educational needs for professional leaders already serving churches and it highlighted the educational needs of lay persons in the church who seemed to crave in-depth educational offerings that were not available in their congregations. The benefactor, Lutheran Brotherhood [now Thrivent], was present and participating in the conversations. On-line discussions were held in the following areas prior to the event, to facilitate the conversations for the face to face gathering.

1. Needs assessment - What are the educational needs of the churches and staff of the Regions?
2. Product development - What information is being called for by constituents and what information is being developed by current faculty?
3. Coordination/Governance Issues - Who manages such an endeavor?
4. Financial Concerns - What is needed to develop a Business Plan and Marketing Plan? What investment is needed by other partners?
5. Technological issues - What technologies will be used to deliver educational material? What technologies do we currently have at our disposal? What future needs might need to be developed?

"On Time Grants"

The seminary found that writing grants was not a gift that came with any of our position descriptions. My own experience had been hit and miss, and the time and energy expended could easily thwart any enthusiasm to do special activities if the funding was not forth coming. A grants writer seemed to be the solution, but little did we know how little she would write. The faculty image was that we would give the grants writer and idea, she would find a foundation, write a grant and we would sit back and reap the benefits. Natalie Hand came to the seminary staff with a background of being a foundation staff person. She refocused our attention to the details that had earlier been many of my stumbling blocks.

Ms Hand did identify foundations for us and lead us to potential grants which we might not have noticed. Yet the initial ideas had to be developed by the staff persons involved. We had to be

clear about our expectations and our reasons for approaching a foundation. We also had to be clear about why our project was a good fit for the stated criteria for funding by this grantor. It's at this point that Ms Hand really started to work for us and with us. As a person who is not familiar with our personal research or special projects, she raised critical questions about our assumptions as we tended to write in the code of our disciplines. We had to be clear to an outsider who resided in our midst. She was an editor without mercy. Our clear passages of flowery prose came back with comments of being direct, concise, and to the point.

She also began to process our multiple ideas into corporate planning ideas that had broader institutional service and support. She kept various faculty and staff from overloading a foundation with multiple requests, or overloading multiple foundations with the same requests. Her advice of having a particular target began to show results.

I. The Lilly Endowment has had a major focus on religion with several competitive grants. In 1999 the Lilly Endowment Planning Grant of $10,000 for "Informational Technology for Theological Teaching Project" was received. The writing of 9 drafts took six months, but the planning process involved a cross section of the faculty. The involvement of the early adopters could almost be guaranteed, but the inclusion of some of the resident skeptics in the planning process has had a dividend that has long term benefits. Our goal was go generate 60 per cent participation by our faculty at the end of the Lilly funding [we assumed that we would get the major grant of $300,000]. As we near the end of the three year grant, we have 100 per cent participation by our current faculty.

II. In 2000, the Lilly Endowment awarded the seminary a $300,000 grant for "Information Technology for Theological Teaching". The grant covered the cost of hiring support staff for educational technology and help desk. Faculty course development grants were offered for those interested in changing their pedagogical styles. Classrooms were updated with equipment and internet access. Though we only expected to experiment with wireless technology, we now find ourselves as a wireless campus. We have also made available for campus wide use the educational platform "Blackboard". For specialized uses we have access to SPSS software. Nearly every class has some form of technological enhancement.

III. Campus wide conversations about the use of technology obviously touched the Library. Our recently retired librarian had worked systematically for almost 2 decades to computerize our library records. As the Eastern Cluster of Lutheran Seminaries began to look for ways that the three seminaries on the east coast could reduce the overall costs of maintaining needed catalogue offerings with resources that no longer could cover increasing costs, the cluster was able to secure in 2001 a grant from the Luce Foundation for "One Library in Three Locations". On July 1, 2002, the three libraries in Columbia South Carolina, Gettysburg, PA, and Philadelphia, PA, began operating with a common web based catalogue. While the information technology staffs were used as advisors, the bulk of the development fell to the library staffs. The current plan to use the mails and other couriers to deliver the single volume resources to the library desk where it has been requested has worked with few problems. The web based catalogue offers access to students and faculty from a wider variety of locations. We are still working on electronic resources and their access from outside the confines of the library.

IV. In 2002, Teagle Foundation awarded the Eastern Cluster of Lutheran Theological Seminaries a grant for "Modeling a Seminary System in Multiple Locations". The staff elements of this grant lay the foundation for a virtual portion of the administration of the three seminaries. Joint appointments are to take place in the following areas:

Dean of the Doctor of Ministry Program,

At present, the Doctor of Ministry Program is located and administered at the Lutheran Theological Seminary at Philadelphia (LTSP) with students enrolled from all three schools. Students can take half of their courses plus do their project-thesis and have an advisory panel at any of the Cluster schools. The other half of their courses, plus two colloquia and candidacy papers must be done through LTSP. Administration is thus streamlined. At least 2 graduate courses per year are offered in a synchronous or asynchronous distance learning mode.

Director of the Diaconal Ministry Program,

In 1993 the ELCA established a new form of rostered ministry called Diaconal Ministry that involves two years of seminary preparation for a Master of Arts Degree. Diaconal ministers, like ordained ministers and associates in minister, are rostered with the ELCA, but their vocational focus is a serving ministry on the boundaries between Church and Society. At present, a Center for Diaconal Ministry Preparation is located on and administered at the Lutheran Theological Seminary at Gettysburg (LTSG) although it serves on behalf of the Eastern Cluster. The Director of the program is available to interpret diaconal ministry preparation for the whole church, and in consultation with the LTSG faculty, provide supervision for students enrolled in the M.A.M.S. program and for affiliate students as they progress through their academic programs at non-ELCA schools. Since this is a relatively new and unfamiliar roster, the interpretative task is particularly important.

To address the geographically dispersed pool of Diaconal Ministry Students, it is planned to put the seven core diaconal ministry courses on-line. This will allow Diaconal Ministry students from other schools and seminaries to fulfill requirements otherwise not accessible to them. Offering these courses in an asynchronous mode will extend the reach of theological education to those, whose work hours and geographic locations are incompatible with regular seminary course schedules.

Director of the Lutheran Theological Center in Atlanta,

As part of a national Lutheran program, Lutheran Theological Southern Seminary (LTSS) and the Cluster have been supporting a special program for African American Lutheran students. The Lutheran Theological Center in Atlanta (LTCA) is an extension of the eight seminaries of the ELCA and works with three Atlanta theological schools to offer courses in a diverse ecumenical environment and theological reflection on urban and cross-cultural issues. The three seminaries are Chandler School of Theology at Emory University, Columbia Theological Seminary, and the Interdenominational Theological Center (ITC) . Located on the ITC campus, the Lutheran Center in Atlanta provides an excellent, intentionally focused educational program for Lutheran seminarians, especially African-American candidates for ministry.

Director of Distance Education,

In November 1999 the Lutheran Brotherhood Foundation funded a conference for Lutheran institutions interested in distance education. The result has been that the Eastern Cluster has coordinated its efforts under the direction of a specialist in Distance Education at LTSP. To date most efforts have been focused on training faculty at the three Cluster seminaries in technologically enhanced education and in developing a network of providers and potential users of distance education in the Eastern United States.

By intentionally gathering the technology staff of the three seminaries, it will be possible to see how efforts could or should be coordinated. Collaborative building of the technological resources within our Cluster will have special benefits as we move toward One Library Under Three Roofs and other efforts of resource sharing. Any collaboration needs intentional leadership.

Joint Faculty Appointment in Bible and Homiletics,

Currently, both the Lutheran Theological Seminary at Gettysburg (LTSG) and The Lutheran Theological Seminary at Philadelphia (LTSP) are short one faculty member in the areas of Bible and Homiletics. In both cases, this has occurred because faculty members were offered prestigious positions at university divinity schools. Due to budget reasons, these positions have not been filled.

This is planned to be a model for Joint Faculty Appointments. This concept of shared faculty would further strengthen the development of the ECLS and lay the foundation for the concept of one seminary system in multiple locations with a common faculty. This appointment will change the autonomous culture of the three seminaries and will fundamentally change how faculty appointments are made. In other areas that are underserved by faculty, future appointments will be collaborative.

Director for Continuing Education and Lay Theological Education.

In response to the growing demand for localized theological education at great distances from the three seminaries but where there are cohorts of desperately needed candidates for ministry, the Eastern Cluster intends to establish a system of centers throughout the East to meet that need. In addition to our distance learning capabilities (including compressed video), it is our goal to devise a plan to provide both asynchronous and synchronous theological education for the proposed centers in large stable congregations in Miami, Charlotte, Atlanta, Washington D.C., Baltimore, Altoona, Pittsburgh, Buffalo, Rochester, Schenectady, Allentown, New York City, New Haven, and Boston. These centers would support candidates in the Master of Divinity program, graduate programs, and participants in lay theological education. To build actual centers in these cities would be financially prohibitive. However, making use of technology, placing faculty in strategic locations, and utilizing the vast infrastructure of the congregations that support our three seminaries will provide education in a way that effectively manages both the costs and the time restraints of faculty and students.

In addition to the establishment of these centers, efforts will be made to utilize the seminaries, faculties, and other persons to plan and hold annual series of continuing education events sponsored by the Cluster. Events will be held on and off the campuses. Coordina-

tion with other institutions and networking will be encouraged, i.e., with colleges, clusters of congregations, teaching congregations, deployed education centers, synods, etc. Continuing education will include face-to-face events, computer-assisted education, and video-conferencing. All efforts will be made to have the programs be self-supporting, at least regarding programmatic costs.

Each of these positions is designed to create further opportunities for the use of technology in the teaching of theology and to be facilitated by the technology that the three seminaries have in place. In many ways the director distance learning also functions as the technology coordinator for the ECLS.

"On Time Technology"

Each time a grant has been put into place, we have structured a common committee to manage each of these grants. Members are taken from a larger pool of faculty and staff called the "Committee for Electronic Educational Development" [CEED]. The responsibility of this planning committee, CEED, is to raise the eternal question of "what next". While all the participants are concerned about the implementation of specific grant proposals, [at the current time we have three technology related grants functioning simultaneously], the CEED committee is raising the questions about what needs to be done next to keep the campus at a level technological plane.

New Building - The Lutheran Theological Seminary has never had a specific building for classrooms. Space has been carved out of the chapel, the administration building, the basements of dormitories, and the library. We are currently at the design development stage for this building, which we have already declared to be a technologically rich educational environment. We budgeted $15,000 to cover the initial expenses of a technology consultant to work with the architect and the project manager. The goal of the CEED committee is to not have one change order related to technology, and still build a building that has the flexibility to grow into a technologically rich future.

Laptop Campus – We struggle almost each month in our meetings about the wisdom of requiring laptop computers for our students. We have researched the implications for accessibility of technology in diverse populations. We have almost come to the conclusion that our part-time minority students may be more computer savvy than some of our more youthful day time students. Yet we worry about the implications of a firm final decision for our part-time students and the occasional auditing student.

Formation for the Church – The question is continually raised by the accrediting agency of the Association of Theological Schools about how formation takes place on the campus of the seminaries, and how formation is to be a part of any educational offering that uses distance learning. The LTSP's written definition revolves around the chapel service and the life on campus. Any students at distance from the seminary miss out on the primary area identified for achieving the formation function.

What other visions are there? LTSP is currently looking for another visionary to look with us into our future to see not only where technology will lead us, but how will we use the technolo-

gies that may emerge. A technological futurist might describe what we are looking for, and we will keep looking.

The challenging part is the assignment that we have given to our grants writer. Her challenge is to be on the look out for new places to send grants that will help us with each of the above items. We know that we need to find some funds to help us in the planning process. We need to find other dreamers with whom we can interact and make designs for a future that is not static. When visions take form, then the task is to find others who want to assist us in placing our ideas into real time frames. Finally we need them to be in a timely fashion, so that we might be fallow for a short period of time to catch our collective technological breath, but we need to be challenged for forge ahead in spite of our small size. We have come to realize that our size is not the detriment that many envision when they are a part of a small campus. The Plan is to have no limitation on vision and implementation. Thereby there is no reason not to expect campus growth, more student enrollment and constituent excitement, and we will remain "On Time."

Developing Growing Need for Soft-Skills in IT Professionals

Dewey A. Swanson
Associate Professor, CPT
812-348-7238
dswanson@puc.iupui.edu
Julie Phillips
Associate Professor, OLS
812-348-7207
japhillips@puc.iupui.edu
Nancy Wilson Head
Associate Professor, CPT
812-348-7211
nhead@puc.iupui.edu
Purdue University School of Technology
4601 Central Avenue
Columbus, IN 47203
Fax (812) 348-7258

Abstract

In this paper we will examine the need for "soft-skills" by information technology professionals. Based on a partnership between Purdue University and Cummins Inc. we will examine the increased need for skills that allow companies to successfully outsource many of the programming and technical positions offshore.

Outsourcing is not new to industry. By outsourcing information technology corporations are finding a way to become more nimble and flexible. Seeking to cut costs in today's sluggish economy companies are looking offshore as a way to significantly cut IT costs. The offshore outsourcing has in many cases meant lost jobs to IT professionals with Fortune 500 companies. However, for those IT professionals left and those coming into the workforce with companies it may mean retooling or refocusing skills that will allow companies to develop and maintain systems that are joint efforts of company's in-house off-shore outsourced staff.

Purdue University's Statewide School of Technology sites have a long tradition of working with industry to provide employees with the ability to work in the ever-changing technological environment. Our Columbus, Indiana campus has a long and successful partnership with Cummins Inc. a Columbus based Fortune 500 company. In the past year we have been working with Cummins to develop a program to retool valued IT professionals at Cummins. The focus is on turning Cummins from a traditional IT organization into one that is increasingly based on dealing with offshore outsourcing skills such as programming and support. The skills required in-house will focus more on the "soft-skills" as Cummins transitions employs from programming to business/system analyst positions.

We will discuss the "soft-skills" that will be needed to survive in this changing work environment. The students that universities are providing to the workforce need these skills. We will look at the program developed based on our partnership with Cummins and how it can benefit

Purdue. Finally, we will discuss the lessons learned and how other institutions can benefit from a similar partnership.

Background

Outsourcing in IT

IT outsourcing refers to using outside companies to provide IT resources such as labor, software, infrastructure and hardware. Offshore outsourcing uses companies located abroad to provide these services. Outsourcing has been around for over ten years in the United States. According to the Gartner Group offshore outsourcing is gaining steam in the United States. According to Gartner Group the draw is lower costs, coming mainly from the use of less expensive labor (Perez, 2003). India is the largest provider of offshore outsourcing for the U. S. Gartner states that with increased quality and less difficulty of offshore engagements it has become more effective model over the past three or four years (Perez, 2003). A report issued by Foote Partners LLC states that by 2005 as many as 35% to 45% of U.S. and Canadian IT workers may find themselves replaced by offshore workers. Some types of IT work can be done for 20% to 50% less in places like India, and Eastern Europe (Hoffman, 2003).

Industry Partnership

Purdue University's School of Technology has a long history of responding to the industry needs in order to enhance the social and economic development of the state. A partnership that has developed over the years is between the Purdue University location in Columbus, IN and Cummins Inc. a leading worldwide designer and manufacturer of diesel engines and related products for trucks and other equipment. Purdue University entered into a joint venture with Cummins Inc. in 1997 in an attempt to benefit Purdue, Cummins and the local community. In this venture the company provided the university funding to: purchase a state-of-the-art computer lab, purchase software, add a faculty member to the Computer Technology Department (CPT), and develop courses using the latest software. Purdue University in return provided: a cost effective training alternative, a nearby source for training information technology personnel, training that utilizes the Oracle database management system, college credit toward a Purdue degree in Computer Technology and university professors to teach the courses. The program named Advanced Information Technology Training Program (AITTP) started as a one-time effort that has evolved into a program offered twice a year since the initial offering in 1997. The Advanced Information Technology Training Program (AITTP) is a program where Purdue University offers six credit courses and a project delivered in a compressed format for Cummins Inc. employees and individuals from the community. These courses have focused in database administrator (DBA) skills. Students go through the program as a cohort group. Since its inception there have been over seventy graduates of the program accounting for over ten percent of their worldwide IT staff.

Cummins Offshore Outsourcing

Cummins like many companies has been hit hard by the economic downturn in the United States. With the economic pressures Cummins has found the cost savings of offshore outsourcing attrac-

tive and have pursued that with a firm in India. Cummins estimates that currently about seventy percent of their IT staff is in applications development and support. To effectively compete management determined that they would need to reduce that to about thirty percent of their IT staff. As many companies Cummins has been forced to downsize and IT staff has not been exempt.

One of the original goals of the AITTP program was to take valued employees with outdated skills and retool them to be effective personnel in Cummins changing IT environment. They reasoned it better to retool these employees that were already in the community and familiar with the Cummins culture than to recruit all new workforce. Many COBOL programmers were retrained as DBAs and Oracle Developers by the AITTP program.

The skills Cummins needed in the move to offshore outsourcing are Business/Systems analyst skills. Anyone reading the trade magazines can see that outsourcing is littered with as many failures as success stories. Cummins aware of that fact and from their own experience with contractors determined they would need to retool existing employees in business/systems analyst skills. Specifically, to be successful with offshore outsourcing Cummins needed professionals that could create tight specification packages that could be passed to offshore programmers. They also needed these professionals to be able to effectively team with these contractors and users to develop and support applications.

Program Focusing on Soft Skills

Program Development

Cummins approached Purdue in the summer of 2002 with a proposal to develop a program to educate/train Business/Systems Analyst. The program was initially to be based on the AITTP program: several credit courses offered in a compressed format. One of the major issues that managers had with the AITTP program was that students were away from their job for twelve weeks. This is difficult in good times but with a leaner IT staff this was not feasible. For this reason Purdue staff and Cummins staff met to develop an alternative format that would be effective. One of the approaches used at Cummins was Six Sigma training where staff would come in for one to two weeks of training and then go back on the job and apply that training on a project and then repeat the process for the next phase of training. This format would cause less of a strain on department workloads. Having settled on this format content and whether the course would be credit courses or continuing education would be an issue.

Cummins, Inc. IT managers (Columbus and overseas), contractors and Purdue University School of Technology professors met to brainstorm what skills a Systems/Business Analyst needs in order to be successful in this new role of outsourcing. The list included technical skills, but there was an overwhelming degree of people skills identified. This seems to be the trend in the industry as demonstrated by the following quotation. "When companies outsource they need to consider a host of "people" issues. The most important is communication which is critical to a successful relationship." (Jones, 1997) Based on the brainstorming exercise the Purdue University professors designed a 2 week, non-credit course that covered two distinct areas: technical and

soft skills. The soft skills that were included for the Systems/Business Analyst training are as follows:

1. Communication Skills
    a. Communication in Transition
    b. Communication Skills (speaking, writing, listening, feedback)
    c. Communicating with Customers (Kano's Model of Customer Perceptions, Taguchi Loss Function, PDCA, Voice of the Customer, Customer Feedback)
    d. Intercultural and International Communications (Definition of Culture, Frameworks for Examining Culture, Cross Cultural Communication Difference, Enhancing Cross Cultural Communications)
2. Teamwork Skills
    a. Developing a Mission Statement
    b. Developing a Vision Statement
    c. Teams/Process (Team Norms, Team Empowerment, Intra-Team Relationships)
    d. Team Meetings
    e. Team Decision Making, Problem Solving, Quality Focus
    f. Managing Conflict
    g. Resolving Differences
    h. Team Assessment

Training on the above soft skills would consist of mini-lectures, case studies, class exercises, videos, quizzes and exams. The approach taken by the professors is an application of the skills learned. These two categories of soft skills were deemed critical to training Systems/Business Analysts since Cummins, Inc. mission is to outsource IT work to India. The training program that was developed was then presented to Cummins, Inc. managers for their review and approval.

Soft Skill Issues and Emerging Program

For several months Cummins management and technical staff continued to review the proposed training. After much internal review the technical staff balked at sending staff to a class that focused on "soft skills" even though those were the skills that had emerged from the meetings. A comment made by one manager was "people should already have these skills". The consensus was that communication skills should have been developed in college and on the job. Cummins training professionals disagreed and pointed to the skill set that emerged from brainstorming session. After more negotiations between Cummins training staff and IT managers they compromised. Instead of a continuing education course Cummins agreed to have Purdue offer two courses in their Systems Integration track (a track used to prepare students to become Systems Analyst). The courses had "soft skills" as part of the course content but tend to have more of a technical focus.

The first phase would be to offer CPT 280 - Systems Analysis and Design Methods, in condensed format (five days and a final exam) and students would then be given a Cummins specific project that they would work on in teams similar to Cummins' Six Sigma training. They would have three progress reports with the team of instructors teaching the course and a final presentation. The course would be delivered in a team approach using four instructors, three from the

Computer Technology Department (CPT) and one from the Organizational Leadership and Supervision Department (OLS). The "soft skills" sections mentioned previously communication and teaming would be delivered by the OLS professor. Cummins ask Purdue to deliver two sessions (fifteen students per session) of the CPT 280 in the summer 2003. Following is the course description and content for the CPT 280 course:

CPT 280 Course Description

This course is an introductory systems analysis and design course for systems/business analysts. The course presents an overview of information systems and the system development life cycle. Course emphasis focuses on structured tools and techniques that the programmer or analyst uses to design/develop/document information systems, some of which include:
(1) Fact finding and requirements gathering
(2) Data and process modeling
(3) Feasibility analysis
(4) Pre- and post-implementation testing
(5) Support requirements. The course also introduces Oracle Designer in the lab portions of the course.

CPT 280 Topics

(1) Why Do Businesses Need Analysts?
(2) Skills For A Successful Business/Systems Analyst
(3) The Business/Systems Analyst's Team
(4) Systems Development Life Cycle (SDLC)
(5) Requirements Gathering
(6) Process Concepts
(7) Introduction to Designer 2002
(8) Data Verification/Modeling
(9) Requirements Verification/Modeling
(10) Process Verification/Modeling
(11) Feasibility Analysis
(12) Cost-Benefit Analysis
(13) Net Present Value Analysis
(14) Payback Analysis
(15) Requirements Packaging
(16) Pre-Implementation Testing
(17) Project Completion
(18) Implementation Plans
(19) Post-Implementation Testing
(20) Support Requirements
(21) The Project Repository
(22) User/Owner Satisfaction Surveys

Later a second phase would have students selected from the two CPT 280 sessions to take the CPT 380 Object-Oriented Systems Analysis and Design course. Following is a course description for the CPT 380 course.

CPT 380 Course Description

This is an advanced systems analysis and design course for future computer programmers and systems analysts. The course presents an overview of the migration from using structured methods for information systems development to using object-oriented methods and concepts. Course emphasis focuses on the object-oriented tools and techniques used by modern day system analysts to perform systems development. It will cover:
(1) The differences between object-oriented and structured methods
(2) The principles of objects and object-oriented concepts
(3) A unified approach to systems development and the UML notation
(4) Object-oriented modeling diagrams
(5) Object-oriented methodologies
(6) Managing an object-oriented project.

Practical examples will be used to demonstrate the object-oriented concepts and methods, plus students will receive hands on experience by working in a team environment to solve a business problem using object-oriented techniques. This course will also survey other important skills for the systems analyst, such as fact-finding, communications, project management, and cost-benefit analysis.

Conclusions

With a weak economy the climate is ripe for offshore outsourcing which can provide a way for companies to save on application development costs. As surveys have shown the trend will continue to gain steam throughout the decade. Companies taking the approach of Cummins that they would like to retain valued employees will find a growing need to retrain these employees in the skills required to stay competitive in the global economy.

Although our involvement in this program was instigated because of Cummins growing move to outsource offshore many companies have been looking for employees with strong "soft skills" even if they are not doing similar moves as Cummins. Companies are looking for employees that are not only technically strong but that communicate well. A complaint often heard is that students are technically strong but weak in oral and written communication skills. A survey of Central Indiana companies sponsored by Indiana Information Technology Association and Ivy Tech State College tends to confirm this. Sixty-one companies responded, and the consensus was that when workers could be located, they turned up short on the communication skills. "You find people who have great technical skills, but you can't put them in front of a client" said Ron Brumbarger, president of BitWise Solutions in Carmel (Heikens, 1999). A survey of the Indiana Information Technology Association (INITA) stated in each category of employer, the biggest deficiencies were not in technical skills but in interpersonal skills. In fact, over sixty percent in each category listed interpersonal skills as a deficiency among job applicants as compared to generally forty to sixty percent in the different category of employers who listed technical skills

(INITA, 1999). As interesting was when employers were ask to prioritize current and anticipated (over the next 3 years) skills required, the "soft skills" made up eight out of the top ten skills required with teamwork, verbal communications, written communications all in the top five skills named (INITA, 1999).

What does this mean for the university and programs like our CPT program at Purdue University? First, as we have found there is a need for the so called "soft skills" and this need will only grow over the next decade. With Cummins we found a way to partner with industry in a "win-win" situation that brought additional funds to our Columbus campus but also provided much needed skills to Cummins existing staff. However, on the downside we found that the technical managers at Cummins reluctant to spend their limited training dollars on these skills. The predecessor AITTP program was a much easier sell that brought the university four times the money brought in by this program mainly because the focus was on technical skills (granted also that the economic climate was also better). We need to do a better job of selling industry that their employees don't just have the skills of teaming and communications.

The other implication from this is that we as educators need to incorporate these skills into our curriculum. This doesn't have to mean adding courses to the curriculum although that is a possibility. Including skills into our classes that promote teamwork, oral and verbal communications can make our students more marketable in the global economy that they will be facing when they enter the IT workforce.

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Utilizing the Tegrity® WebLearner for Classroom Presentation Capture and Streaming

Tom Wallace
Associate Professor of Computer Science
Director of Academic Technology
Northeast State Technical Community College
P.O. Box 246
2425 Hwy 75
Blountville, TN 37617
tbwallace@northeaststate.edu
Office: (423) 323-3191 ext 3388
Home: (423) 354-2413
Fax: (423) 323-3063

Abstract

The Tegrity® Web Learner device makes the capture and distribution of lectures and lessons, easy to accomplish without a huge expenditure in equipment and personnel. After a minimum of training, faculty can easily record their lectures in real-time, or even broadcast their lecture to other computers via the Internet as the lecture is taking place. The captured sessions can then be placed onto a server for on-demand streaming.

This is accomplished using software that is built around Microsoft Windows Media platform. This platform offers many advantages including tools that are freely downloaded from the Microsoft Website.

Permission Statement

Background

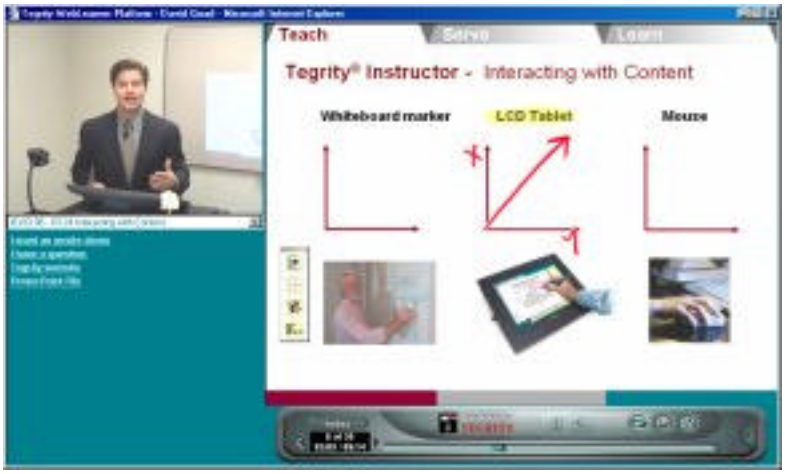
As the cost of technology decreases, and the impact and expectation of professional quality presentations in both business and educational settings increases, a need developed for an easy-to-use product that can enhance the presentation. The Tegrity® system was originally developed as a product to enhance the business Powerpoint presentation. Many businessmen use the Powerpoint software from Microsoft to prepare presentations, which are projected onto a standard whiteboard in offices and boardrooms. During the presentation, additions, annotations, and other markups may be made which assist in the explanation and discussions. Following the presentation, a copy of the Powerpoint presentation might be given to various participants, but the annotations would not be included because they are left on the whiteboard.

The original Tegrity® system was designed to capture the whiteboard annotations and record them so businessmen could distribute their Powerpoint modules after a presentation and retain any additional markups. Since educators also make extensive use of Powerpoint presentations, and have the need to capture potential additions to their slides, the Tegrity® WebLearner cart was developed.

Tegrity® WebLearner

The WebLearner cart system, consists of a mobile cart, a computer, keyboard, mouse, network card, a video projector, a wireless microphone, a document capture camera, a video capture camera mounted on top of the projector, and a third camera to capture the presenter. Capture, editing and server software are also included. Options include a LCD touchpad and an additional video capture card to allow a fourth camera to be used, possibly to capture the audience.

Ease of Use



The basis of any presentation on the WebLearner is the Powerpoint presentation, which is projected onto a standard whiteboard. This presentation can either be developed on the WebLearner cart using pre-defined templates, or it can be imported to the system via removeable media.

The pre-defined templates include a blank page, a graphing matrix, bulleted notes, and a variety of other standard presentation formats. The pre-defined templates can be customized for specific situations.

Once the presentation is projected onto the board, a "virtual" icon pad is also projected in the lower left-hand corner of the Powerpoint window. This icon pad is normally not seen as part of the presentation. The instructor can control the presentation from the board, using the icon pad. The icon pad is used by simply placing the finger over the icon. The shadow is detected by the camera and the action is taken. This control can include changing slides, capturing markings placed on the board using a standard whiteboard dry erase marker, and changing from the Powerpoint mode to a screen capture mode.

The screen capture mode allows the inclusion of any software that can be run on the PC to be included in the presentation. Prior to starting the Powerpoint presentation, the desired software package is started, and the window is minimized. When needed, the package is selected, and replaces the Powerpoint slide in the slide window. This makes it ideal for "how to" training in software packages, and the use of the Internet. This option makes the WebLearner an excellent device to provide faculty and staff training, especially for adjunct faculty who might have only limited accessibility to training options.

Another feature that adds to the versatility of the WebLearner is the ability to utilize the document camera for either full motion or still frame recording. The document camera is attached to a flexible "goose neck" and is easily positioned to capture objects placed on the cart surface. The document camera can also be attached to a microscope or other optical device. When used in full capture mode, the instructor image is replaced in the instructor window with the document camera image and any action taken under the camera is displayed. By tapping either the appropriate place on the touchpad, or the "0" key on the keyboard number pad, the current image is captured and placed in the larger Powerpoint slide window. This is ideal for capturing graphing calculators, or other handheld objects for display to the class.

Another use for the document camera is to capture pages from books or other documents. The ability to move the camera close to the object and still retain focus control assists in bringing extremely small objects to the presentation.

Editing the Captured Video

Once the presentation has been captured, the resulting file may be edited. An editing program is included with the system which allows portions to be cut from the recorded file by marking a starting and ending point. This makes it convenient for the presenter, because if an error is made during the presentation, all that needs to be done is to pause, then start the portion of the presentation again. The point where the error was made can be marked as the starting point and the end of the pause can be marked as the ending point and the error can be deleted from the captured file.

The resulting file is an MPEG compressed file so any third party MPEG editing software can also be used to edit the captured file. Many third party programs also include additional editing features, and if the editor is already familiar with the software, will reduce the time to needed to produce the finished presentation by eliminating the learning curve.

Through the use of MPEG compression and the fact that motion video is confined to a smaller instructor window, the final presentations are small considering the amount of information that they can contain. On the average, a 1 hour presentation can be contained in approx. 120MB, or a little larger than a ZIP disk.

Streaming the Presentation

Included with the WebLearner is server software to allow the presentations to be streamed in either "on demand" or "broadcast" mode. The streaming can also be at different speeds to match the viewer's Internet connection speed. Viewers with high speed broadband connections such as cable modems, T1 or DSL lines can receive the streams at up to 300kbps. Viewers with only a dialup connection can receive the streams at 28.8kbps. The higher the transmission speeds, the better the quality.

Most classroom and training presentations will be viewed as "on demand" streams. It is possible to set up the server software to provide "broadcast" or real-time reflection of a presentation, while it is being produced. The number of viewers who can participate in this broadcast stream is determined by the number of licenses that are purchased. This is also true for the number of viewers who can view "on demand" presentations at any one time.

No Additional Equipment or Personnel Needed

The Tegrity® WebLearner cart provides a self contained presentation capture and streaming system, which is easy to use and portable. Faculty can operate all of the equipment and software with a minimum of training so a technician is not needed to run the equipment. It can provide a vehicle for real-time multipoint one-way broadcasting from the cart in the classroom, or with an add-on product called Tegrity® Live, it can also provide for two-way interaction via typed messages or microphones with Voice-over-IP.

No additional equipment is required to produce the streams. Lighting can be problem, especially in older interior classrooms, so clip-on lights may be used to improve picture quality.

Although the streams can be broadcast to several points, this technology is not designed to eliminate the interactive distance-education classroom with multiple television monitors and microphones. The distribution points are intended to be individual PCs with the recipient sitting in close proximity to the screen.

Summary

The Tegrity® WebLearner cart provides a realistic alternative to a recording studio for producing streaming video of lectures and certain types of presentations. It allows the instructor to maintain control of the presentation and to present in the style that best suits them, without the need to adapt to the recording environment.

Faculty who either feel that a particular subject or lecture does not lend itself to distance education, or who feel that lecture is needed for clarification can now produce those lectures with a minimum of problems. Lab instructors, who have a difficult time demonstrating techniques for large classes, can demonstrate the labs visually and have the students preview the lab before reporting to class. Training on software packages or "how to" training such as how to use handheld devices can be made available as needed eliminating the need to repeat the sessions, and insuring a consistency of instruction, because everyone is receiving the same content.

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Using Blackboard for Student Electronic Portfolios

Darrell B. Warner
Associate Dean of Academic Affairs
864-833-8598
bwarner@presby.edu
William W. Yarborough
Director of Academic Computing
864-833-8414
blyarb@presby.edu
Presbyterian College
503 S. Broad St.
Clinton, SC 29325

Background

In 1998 as part of its strategic planning process, faculty at Presbyterian College identified the need to both assess and emphasize students' communication skills as a key aspect of educational programming. By 2000, a task force had been established to assist in the development of a mechanism to showcase such student accomplishments. This lead to the creation of the Student Portfolio to document skills in "communicating across the curriculum." This portfolio is expected to be in place for all students entering the college in 2004.

In 2001, faculty approved a formal proposal for curriculum changes that included specific content about the proposed portfolio approach. According to this proposal, "Writing, speaking, and information technology should be integrated across the curriculum, beginning with general education in the freshman year and culminating in the Senior Capstone course and discipline specific projects…It is through the aforementioned portfolio that the student will demonstrate the development of these proficiencies." (Presbyterian College, *Proposal to implement general education objectives in the strategic plan*, 2000). What was not included in this proposal was just how the portfolio was to be developed, although the time frame for its use remained with the 2004 entering class.

In the fall of 2001 a small group representing various constituencies at Presbyterian College began to meet to conceptualize just how such a portfolio could be created. Various models of portfolios and their intent were reviewed (for a good resource, see Huba and Freed, 2000). Web sites, such as http:// aahe.ital.utexas.edu/ electronicportfolios/ TOC.html and http:// www.electricteacher.com/ onlineportfolio/ index.htm, provided valuable ideas about both the content and processes of establishing student portfolios. It was decided fairly early in the process that the portfolios would be electronic rather than paper and pencil. This was consistent with the college's goal of being a leader in helping integrate technology into its curriculum. Of particular importance was the development or identification of software or programs to support the electronic portfolio plan.

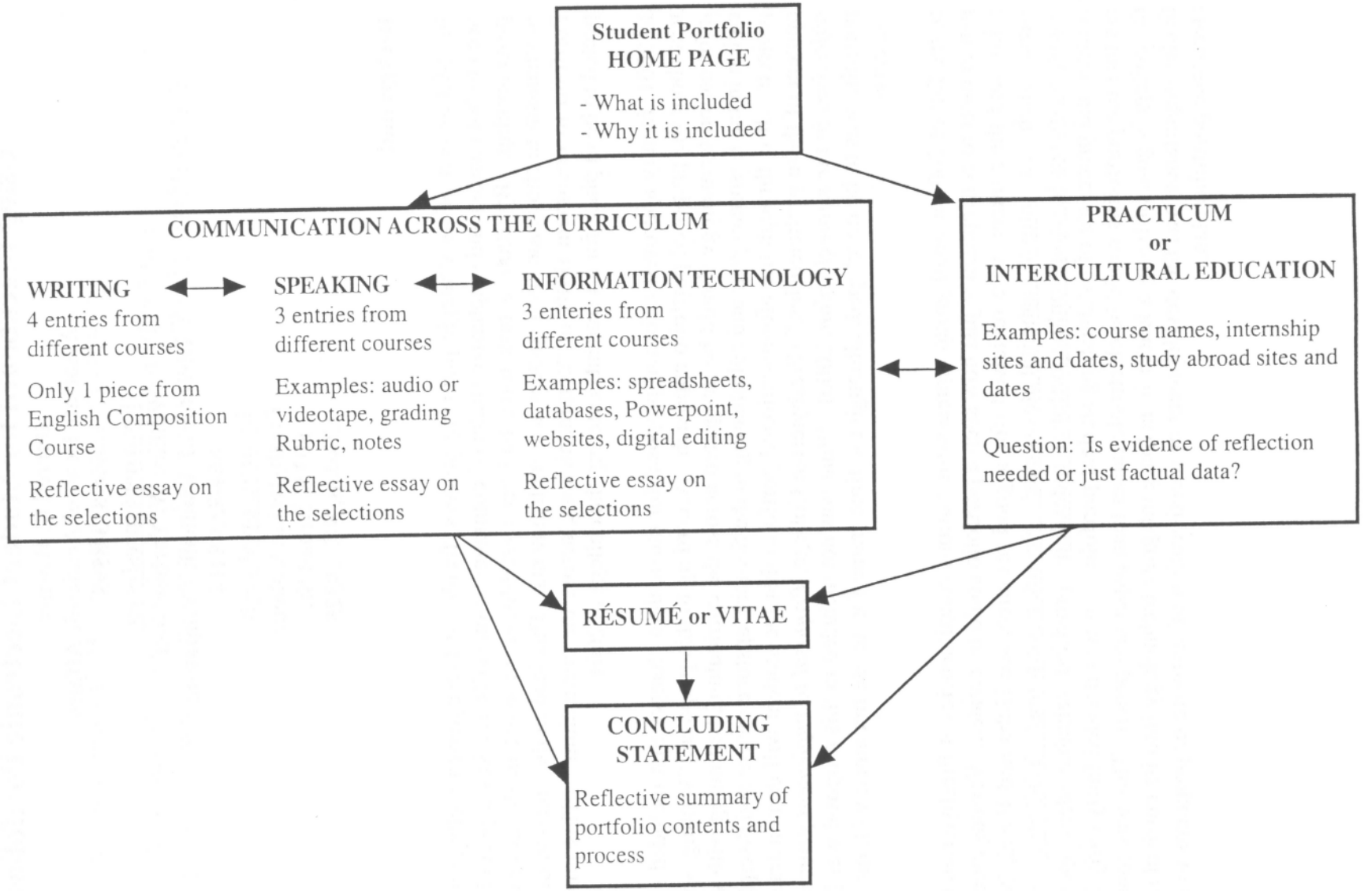

Diagram 1: *Requirements for Presbyterian College student portfolios.*

Portfolio Considerations

One of the first tasks of this planning group was to articulate what would be included in a student's portfolio. Using the idea of communicating across the curriculum as a guide, a template of the portfolio was developed. Writing skills would be demonstrated by a minimum of four entries in the portfolio, speaking skills by three entries, and information technology skills by three entries. Entries would come from a variety of courses, and would include work from general education, major, and elective hours. While the writing entries were fairly straightforward in explanation, further thought was given to the other two categories. Speaking skills were further defined as audio or videotapes of presentations or notes or grading rubrics for such presentations. Information technology skills were defined as skills in developing spreadsheets, PowerPoint, web site development, and other similar skills. It was further decided that each section would require a reflective essay on why the particular examples were included in the portfolio (see Diagram 1). An additional section of the portfolio could be used to document the student's involvement in intercultural education, internships, or practicums, another curriculum initiative.

An important consideration of the portfolio was how to determine which selections a student should include. To address this, a two-phase process was suggested. First, students would need an authentication form from the faculty member involved in an assignment that the student wanted to include in the portfolio. The faculty member would complete the form that a work was of sufficient quality to include in a portfolio, and that form would be scanned into digital format for inclusion along with the actual portfolio entry. It was thought that students could save more works than would actually go into the final portfolio. The second process would occur when the student made final decisions about which works to include in the official portfolio.

Evaluating the portfolio was another concern, but this was more easily addressed. Since every entry into the portfolio had already been evaluated and authenticated by a faculty member, the only remaining task was to ensure that the student had actually entered the required number of items in each area of the portfolio. It was decided that one of the roles of the faculty member in the various senior capstone courses would serve that role. What to do if a student failed to meet the minimum requirements is an issue yet to be resolved.

The Technology Challenge

The work which established the general requirements for our student portfolios and the approval process for submissions also established a number of desirable features that an electronic portfolio should have:

- easily managed by the student
- fully accessible to the student's advisor
- the option to allow others controlled access
- flexible enough to store and deliver a wide variety of types of documents
- accessible over the web

We briefly considered attempting to produce such a system from scratch ourselves, but soon realized that we already had a way to address most of these requirements in place. Like many colleges, Presbyterian College had decided to commit to a Course Management System (CMS) –

Blackboard 5.5 at that time. A small group of faculty had been trained in its use and were already training others. The use of Blackboard was growing at a rapid pace, and exceeded usage projections. The advantage of using Blackboard (as would be true of most other CMSs as well) is that it automatically provides a hierarchy of user types with varying levels of access to its courses, is accessible via the web, and is designed to allow instructors to store and organize a wide variety of course materials and to control who has access to them. In other words, the very characteristics that make a CMS useful for a faculty member to organize and present materials to students could also be useful to students in organizing and maintaining an electronic portfolio. The fact that many students and faculty were already somewhat familiar was an added advantage.

The version of Blackboard that Presbyterian College was using initially did not allow much flexibility in terms of labeling buttons or sections. Despite this limitation, a template of the e-portfolio was designed using the Blackboard software. Surprisingly, with some modest adaptation, Blackboard appeared to be a very suitable platform for the e-portfolio. It was easy to distinguish for students what they should add to the portfolio, where it should be added, and what should be left alone within the template design. With some modest refinement, a first draft of the portfolio template was ready for field-testing.

We started the development of our Bb-based electronic portfolios in the fall of 2001, with the first "pre-pilot" use taking place in the spring semester of 2002 by ten upper-class English Writing Center student assistants who volunteered for this activity. These were all known to be "good" students, but with no particular technology skills, making this a fair test of the function and usability of the approach we had chosen. The response from this group was unanimously positive. In the fall of 2002 and spring of 2003, electronic portfolios were made available to approximately 40 freshmen in the college's pilot of the "Introduction to Inquiry" course. While the initial response was enthusiastic, few students have actually tried to use the portfolio. It would appear that without the requirement of its use, the portfolio would not be utilized as we had hoped.

The Approach

Our approach to creating electronic portfolios was strongly guided by our earlier decisions about the nature of student portfolios in general. A P.C. student's e-portfolio is intended to serve three distinct purposes: documentation of completion of some specific requirements, a learning process which includes reflection, and a way for the student's work to be made accessible to others (such as parents, potential employers, and graduate schools). In particular, we had decided to control the structure of the portfolios fairly closely, as opposed to allowing students 'free rein' over what to include and how to present it. Note that this decision was guided by institutional pedagogical interests, not by the technology. Our primary task was to find an appropriate way to use our available technology to implement this type of portfolio program.

The first step was to design a "template" course to establish the required structure of the portfolio. It also includes some descriptive background information about the electronic portfolio program at Presbyterian College and its goals and basic instructions to students concerning the types of materials which should be submitted.

In the CMS template the number of "Areas" is reduced to only five: *Welcome, About P.C. E-Portfolios, Personal Information, Portfolio Documents,* and *Guest Access Materials*. (These areas were initially named Announcements, Information, Staff Information, Projects, and Documents, but with the upgrade to Blackboard 6.0 in the Spring of 2003 it became possible to name them more appropriately.) All other areas of the CMS were disabled for this application. The diagram below (Blackboard's *Course Map* for the template site) illustrates this structure:

- **Welcome**
- **About P.C. E-Portfolios**
  - Overview
  - About Portfolios
  - Presbyterian College E-Portfolio FAQs
  - Portfolio Requirements
- **Personal Information**
- **Portfolio Documents**
  - Purpose of this Area
  - Communication Across the Curriculum
    - Writing
      - ☒ Put the title of your paper here
      - ☒ Put the title of your paper here
      - ☒ Put the title of your paper here
      - ☒ Put the title of your paper here
    - Speaking
    - Information Technology
  - Practicum/Intercultural Education
  - Concluding Statement
- **Guest Access Materials**

Diagram 2: *Course Map for the P.C. E-Portfolio Blackboard template, showing both the structure and some of the initial content.*

The **Welcome** area provides a place for an opening message along with any other initial announcements about the portfolio. It will ordinarily include the student's name and contact information along with any other introductory comments the student wishes to add. More detailed personal information is placed in the Personal Information area.

The **About P.C. E-Portfolios** area provides background materials on the concepts and philosophy of Presbyterian College E-Portfolios as well as descriptions of the requirements. It is intended to be useful both to students and visitors, and its content should not be changed by the student. This presents a minor dilemma: How do you keep students from changing such content while giving them the control they need over other content? We took a "low-tech" approach. If the title of an item is originally in blue, it is not to be changed.

Within the Portfolio Requirements section of the About P.C. E-Portfolios the issue of authentica-

tion is addressed. We had decided in the initial planning stages that only documents which have been approved by a faculty member can be included in a student's portfolio. This requirement presented some technological challenges which we have addressed by providing a PDF file of an "Authentication Form" here. Students are directed to have the faculty member complete and sign a form for each submission, and then the student (perhaps with help in a computer lab or the Media Center) is to scan the completed form and add it at the appropriate location in the e-portfolio. This is admittedly somewhat awkward and we may consider other approaches as the number of active e-portfolios increases.

The **Personal Information** area gives a student a place to provide more detailed personal information, including a photograph if desired. Students are instructed to think of this area as being like an electronic cover letter. It also allows for a link to an external web page which may be used as a more flexible and creative on-line résumé.

The **Portfolio Documents** area is the primary part of the e-portfolio. It will ultimately contain the final versions of all of the official portfolio items along with the scanned authentication forms. It may also contain additional materials, depending on the nature of the submission. In the template, folders (with blue titles!) are provided for each of the types of materials which are required: writing, speaking, information technology, and a practicum or intercultural education. There is also a place for the student's concluding statement, which is to be a reflective summary of the portfolio content and process. Within each blue-titled folder are the appropriate number of placeholders which are to be replaced by the student's submissions as they are completed. In the Course Map above, the Writing folder has been opened to show the four placeholder folders which will be required. Similar placeholder folders are also already in place in the Speaking and Information Technology folders.

The **Guest Access Materials** area of the e-portfolio serves several purposes. As the title suggests, documents placed in this area are viewable by guests (i.e., individuals other than the portfolio's owner and advisor). Its structure is more flexible, allowing the student to be more creative if desired. It may contain the same documents which are in the Portfolio Documents area, but that is not required. In particular, authentication forms and perhaps other supporting materials may be omitted. Also, materials which are not included in the official portfolio may be stored here. The upgrade to Blackboard 6.0 significantly simplified this process by allowing a document to be uploaded only once and then reference from multiple places.

A copy of the e-portfolio template is then used to create a Blackboard course site for each student. The student is enrolled in the site as a Course Builder – a designation within Blackboard which allows the student to add/remove/edit content (i.e., documents of various types) as well as perform other basic administrative functions. The student's advisor is enrolled in the course as the Course Instructor, thereby giving the advisor complete access to the site as well.

Access to a student's portfolio site by individuals other than the student and the student's advisor must be carefully considered. There are several ways in which access can be controlled. The course site is initially created as "unavailable," meaning that only the course instructor and course builder (i.e., the student and the advisor) can even tell that it exists. Guest Access is initially turned off, so even if the site is made "available" it can't be accessed by anyone who

doesn't have a P.C. Blackboard username and password and is not intentionally enrolled in it. (Blackboard 6.0's new Observer role might prove useful.) And if the student decides to turn Guest Access on, guests are initially restricted to certain areas of the course; in particular, they cannot see the Portfolio Documents area. It is worth noting that, as Course Builders, students can change the guest access settings for their site, but they are cautioned about the effects of doing so. In the presentation at the conference both the template and a partially complete sample e-portfolio will be shown.

Future issues

The future of the electronic portfolio at Presbyterian College depends upon several things. At present, the faculty is re-evaluating the direction of curricular reform and innovation. If the proposed first-year seminar program were to be eliminated, then introducing the portfolio would become dependent upon some other course doing so. While Freshmen English might be an acceptable location, it could then appear that the portfolio is an English requirement rather than a college-wide requirement. One of the portfolio's current strengths is that it is a shared responsibility of the faculty and not the burden of any single department. Similarly, the capstone courses in the various majors need to be willing to take on a certification role that attests to the rest of the campus that the portfolio is complete. Finally, additional resources, particularly in hardware such as scanners and electronic storage, will be needed to serve the entire student body when everyone is developing a portfolio.

Other questions yet to be answered address longer term issues. How long should the portfolio be retained by the college? Who should have access to it long-term? How long should access to the portfolio be available for graduates? For others who leave before graduation? What happens if a student does not meet the portfolio requirements? What if student and professor disagree over whether something should be included in the portfolio? These and similar issues need to be carefully examined and resolved, hopefully prior to implementing the portfolio requirement prior to Fall 2004.

Update

Since we started this portfolio project in 2001, a number of new options have become available. Two of the most interesting are iWebfolio™, a commercial electronic portfolio management system by NuVentive (http://www.iwebfolio.com) and the Open Source Portfolio Initiative, established in January 2003 by the University of Minnesota and the University of Delaware (http://www.theospi.org). Both are very flexible and have good online demonstrations and samples available. The two major distinctions between these two products and our Blackboard-based e-portfolio are that these products provide a much more polished looking portfolio (they are designed specifically for that one purpose), and that it would be difficult to configure either to strictly enforce the structure we have chosen for our portfolios. The NuVentive product is reportedly available in a format which can be integrated into Blackboard and perhaps other CMSs.

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E-Portfolios for Student Teachers—a Pilot Program

Robert Morse
Instructional Designer
Center for Instructional Technologies
317 788-3209
rmorse@uindy.edu
George Weimer
Professor of Teacher Education and Music
317 788-3256
weimer@uindy.edu
University of Indianapolis
1400 East Hanna Avenue
Indianapolis, IN 46227

Abstract

In the fall and spring of 2002-2003 eight student teachers each semester volunteered to participate in a pilot program of e-portfolio development to meet licensing standards for the state of Indiana. The University of Indianapolis Center for Instructional Technologies developed a framework for the portfolio using the template feature of DreamWeaver. Students converted elements of a traditional paper portfolio into a browser-based, interactive, hypertextual format that was later burned onto a CD. Students reflected more on their teaching and included samples of lesson plans, assessments, and student work. Richer work samples included movies, sound files, scanned material, hyperlinks to the school web site, and other offsite resources to make the portfolio more personal. Several student surveys indicated the pilot students believed they had learned more and had a more positive experience than their peers in a control group developing a traditional portfolio. Sample portfolios will be demonstrated and discussed in the session.

History of the U of I Portfolio Project

The University of Indianapolis has developed a semester-long student teaching experience for all teacher education candidates. Each candidate is placed into two eight-week experiences with a Cooperating Teacher in the field and Supervising Teacher from the university. During the first placement each candidate completes a high-stakes paper portfolio based on the ten INTASC (Interstate New Teacher Assessment and Support Consortium) Principles and Indiana Content Area standards.

INTASC Principles:

1: Knowledge of Subject Matter
2: Knowledge of Human Development & Learning
3: Adapting Instruction for Individual Needs
4: Multiple Instructional Strategies
5: Classroom Motivation and Management
6: Communication Skills
7: Instructional Planning Skills
8: Assessment of Student Learning

9: Professional Commitment and Responsibility
10: Partnerships

Major sections of the portfolio include a table indicating where in the document each INTASC principle is demonstrated and whether it is satisfactorily completed, a Culture and Climate of School and Community, Students with Special Needs and Services, Sequence of Five Lesson Plans including reflections and analysis of student learning, and Documentation of Professional Involvement. Copies of student work (tests, papers etc.) are usually included. Most sections have subsections with requirements described in detail in the U of I Student Teaching Handbook. Also, one of the five lessons is videotaped, and the unedited tape is presented with the portfolio and is evaluated by the reviewers. The process has been approved by the Indiana Professional Standards Board as part of the university's Unit Assessment System.

Candidates are guided through the paper portfolio process in a series of student teaching seminars led by the director of student teaching and others. Additionally, university student teaching supervisors meet with individual student teachers and in open sessions to answer questions and guide the portfolio process. Samples of previously successful portfolio models are presented for examination (with candidate's name removed).

When portfolios are given to the Director of Student Teaching, she distributes them to both a teacher in the field and a university professor for review according to the strict INTASC and Indiana content area standards. If both reviewers rate the portfolio as "satisfactory," the process is complete. If both reviewers rate it as "unsatisfactory," the candidate must complete a second portfolio during the second placement (eight weeks). In the event of a split decision, a third reviewer is selected.

Historically, the process has produced a high level of anxiety among student teaching candidates. It has also produced masses of documents that are stored permanently by the Department of Teacher Education. In order to reduce the paper torrent, to make the portfolio more reflective, and to improve technology skills of the candidates (consistent with NCATE standards), the department decided to undertake a pilot digital portfolio program during the 2002-2003 school year.

To that end, a professor in the department was given three hours of released time during the fall semester and one hour during the spring to coordinate the digital pilot, administer and evaluate surveys, and to maintain a detailed log of the pilot experience. Discussions with the U of I Center for Instructional Technologies (CIT) indicated that unit was interested in participating in the pilot in order to use it as a potential model for other digital portfolio efforts at the university. The Instructional Designer within the CIT became a willing partner in the process and became the primary trainer, technical support person, and template developer. Discussions resulted in choosing DreamWeaver as the software solution for the portfolio software. It came most close to meeting the goals and requirements for the pilot study listed below.

Goals for the digital portfolio project included:

1. Refine reflection on the results of student teaching (student outcomes) by identifying stu-

dent teacher actions and student achievement associated with INTASC standards.

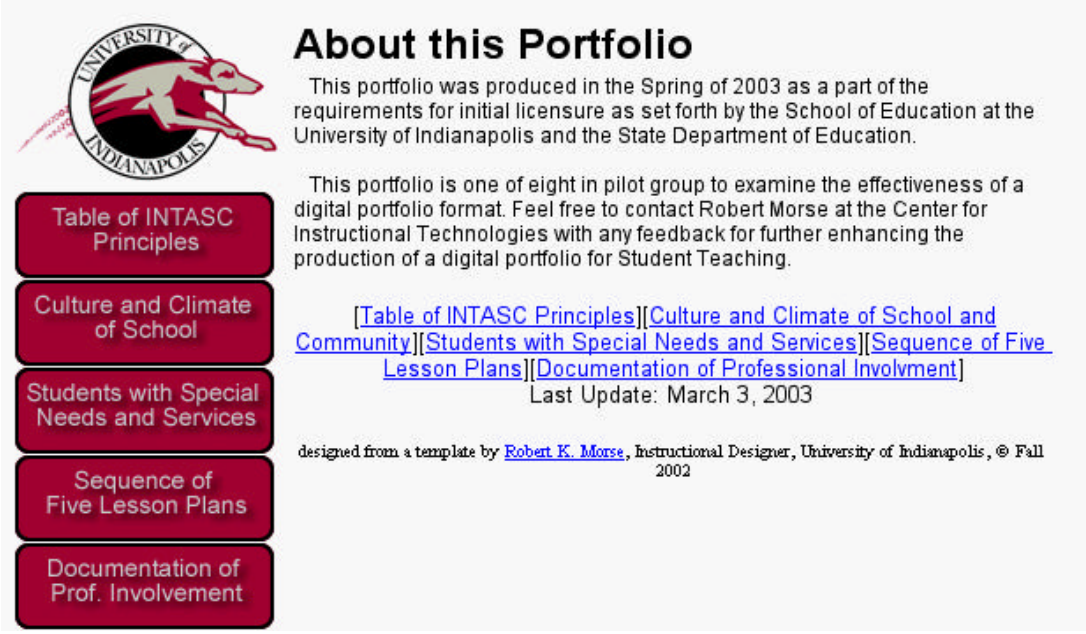
2. Introduce hardware and software to student teachers with the goal that they will model the process to others and become more proficient in using the technologies and assessments with their students.

3. Develop procedures and training materials to continue development of digital portfolios.

4. Assess the feasibility of creating digital student teaching portfolios and refine goals and procedures.

Other requirements of the pilot were that the portfolio be: reasonably simple for candidates to complete given the short eight-week time frame, user-friendly for reviewers, and accessible both in Windows and Mac OS. A related goal was to allow candidates to volunteer to digitize portions of the video of their lesson to link to portions of the digital portfolio. This was not intended to substitute for the 45 minute VHS format video which would also be submitted, but to enhance reflection on their teaching by having them relate selected video clips to INTASC standards and goals.

During the summer of 2002, the Instructional Designer prepared an HTML portfolio template using DreamWeaver 4 software by Macromedia. The template contained placeholders for all required elements of the traditional portfolio and attractive graphic links among all of the major sections. Student teachers would be required to add their own text and scanned graphic content and construct HTML links for their own content within the template.



Sample Page from Template

All pilot participants were volunteers (eight in the fall semester, six in the spring). They signed an informal contract with the pilot leaders agreeing that their work might be shared with others, that all requirements for the digital portfolio were the same as for standard portfolios, and that they would participate in surveys of the project. Additionally they agreed they understood that in all likelihood the digital pilot would require more time than the traditional portfolio, and that they could resign from the pilot group at any time and submit whatever they could on paper with the understanding and support of the department. A list of their names, phone numbers and e-mail address was shared with all participants to maximize communication.

A schedule of support sessions was distributed. In general, the sessions were held on alternate Monday afternoons, chosen to alternate with the usual Student Teaching Seminars that are approximately every other week. During the fall semester, additional time was available on a voluntary basis during the hour just before the regular seminar. This was a time when university supervisors traditionally met with their candidates, and it did not prove to be convenient for the participants. It was eliminated during the second semester. (Although it seemed like a fine idea to eliminate this, the spring semester candidates indicated more strongly in their final surveys that more support time would have been helpful.)

A Title II grant provided funds for the purchase of Zip disks (1 per participant) and CD-RW discs (minimum of 3 per candidate) for the pilot.

Held commonly among those involved in planning the pilot program was a concern that reviewers for digital portfolios might be difficult to find. We feared they would ask us just to print off a copy for them to read. Those concerns proved to be only partly correct. There was some reluctance on the part of reviewers to take a digital portfolio. In some cases only a little encouragement persuaded a reviewer to work with a digital document.

We actively sought comments from reviewers concerning ease of use or problems encountered. Though we had no formal instrument to collect this information, an amount of feedback came to us. In the fall, comments were generally favorable, though one reader strongly suggested that without traditional page numbers it was very difficult to refer to any specific location in the portfolio when commenting. In the spring experience, we suggested candidates put a small number in parenthesis at the end of every paragraph on every web page. Apparently, this combination of page name, from the heading, and paragraph number satisfied this concern. After all portfolios had been reviewed, a member of the Teacher Education Department volunteered the comment that the digital portfolio she had reviewed was excellent and very easy to follow.

When students were ready to download the template, they directed their web browsers to a specified location on the CIT website. Students retrieved a file in .zip format and used Winzip to uncompress the files to a folder on their Zip disks labeled *EdPortfolio.* Students were given quick tip sheets explaining the basics of Dreamweaver, project management tips, and an overview of the template and how it was to be used. At the end of the eight weeks, students brought their Zip disk to the Center for Instructional Technologies where the *EdPortfolio* folder was added to a set of instructions and downloadable plug-ins for reviewing the portfolios.

A menu was created in Flash MX to provide the reviewer with the option of viewing the portfolio or browsing the CD to find a plug-in support page. Quicktime Player, Acrobat Reader, and the suite of Microsoft Office readers were provided to reviewers. A one-page sheet of instructions was provided to each reviewer. This instruction guide outlined the steps to take in opening the portfolio or browsing the CD for additional support.

We were gratified that all digital pilot participants passed the portfolio review process. Though we realized they might not, we had no real plan of how to proceed for a second portfolio process. We speculated that had a digital pilot candidate failed the first attempt, they might well decide to create a more traditional paper portfolio the second time around. Fortunately, we did not face that situation.

Final Survey

A survey was administered to all pilot participants and to an equal number of randomly chosen non-participating student teachers asking essentially comparable questions concerning the success of the portfolio experience as a whole. The digital group questions were pointed at the *digital* portfolio preparation process, while the control group questions referred simply to the portfolio preparation process. A summary of the significant results include the following:

When asked, "How comfortable were you creating your portfolio, 100 percent of the digital pilot participants selected "comfortable," while 70 percent of the control selected "comfortable," with 30 percent selecting "uncomfortable." Note: not one candidate selected "very comfortable.") Digital respondents volunteered the comments that they felt rushed, needed more work sessions, and were comfortable, but stressed more about the content than the process.

On an item asking whether they received adequate support and assistance preparing the portfolio, 50 percent of the digital participants selected "very adequate," with 50 percent of them selecting "adequate." Of the control group, 60 percent selected "very adequate," and 40 percent selected "adequate."

The digital group felt the computer labs provided were "very adequate" (30 percent) or "adequate" (70 percent). Anecdotal comments from the pilot group indicated some did most of the work on their home computer. Some of the students acquired a 30-day examination copy of DreamWeaver and installed it on their home computers.

Interestingly, when asked to respond to, "The digital portfolio experience has been beneficial to me, 100 percent of the digital group selected "agree," the strongest possible choice, while 40 percent of the control group selected "agree," 40 percent selected "unsure," and 10 percent indicated, "disagree." One candidate who has secured a teaching position for next year indicated her new principal was extremely impressed that she had completed a digital portfolio.

The issue of whether having volunteers for the pilot group may have skewed any results seems to have been answered by the item, "If you had it to do over again, would you participate in the digital pilot group?" 90 percent of the digital participants (self selected) indicated "agree," the strongest possible choice. However, one respondent added, "Absolutely. But I might not have

thought so at 3:50 p.m. when it was still burning, but looking back, it is a great final product." The question for the control group was, "If you had been invited to do so, would have you participated in the digital portfolio?" Fifty percent of the control group indicated "unsure," while 50 percent chose "disagree." The issue of whether duplicating the pilot with all student teachers may be feasible is clouded. Apparently something needs to change before it will appeal to all candidates.

We wanted to know whether participants believed the digital process enhanced reflection on the experience. The item "Using the digital portfolio allowed me to reflect on how various parts of my student teaching experience related," 60 percent of the digital group indicated "agree," the strongest choice, with 20 percent choosing "unsure," and 20 percent selecting "disagree." The word "digital" was removed from the control group item. 40 percent of them believed the portfolio enhanced reflection, while 50 percent were unsure, and 10 percent selected "disagree."

Pilot participants were asked to respond to: "The digital portfolio process is a good one and adds to the quality of the student teaching experience." 100 percent of them responded, "agree," the strongest possible choice. The control group item read, "The portfolio process is a good one and adds to the quality of the student teaching experience." Thirty percent agreed, 40 percent were unsure, and 30 percent selected, "disagree."

Comments from the digital group:

Open-ended comments were requested from the digital pilot group. A summary of their responses follows.

It is not as simple as copy/paste from a Word document. It would be easier if we all had DreamWeaver at home.

I do not have a computer at home. Working at school was time-consuming.

Don't ask us to miss portfolio help sessions to do the digital instruction. Plan it at another time.

I'm not sure how successful this would be if the whole group were required to complete the digital format, because it requires a certain amount of motivation and a TON of perseverance and time.

I got more out of the digital work sessions than out of the seminars. I think it would be beneficial to add digital movies to show teaching "in progress" and to show INTASC standards.

Set deadlines/expectations for each meeting, so that people will stay on track.

I really liked the way the other e-portfolio members helped each other. I think there was a lot of support from within the group. I also thought the e-portfolio was more work than the traditional one, but the end product was worth the work.

Tell student teachers about the digital group the semester before. This will provide them time to familiarize themselves with the program being used. (Have) multiple work sessions each week, to avoid conflicts with student teacher help sessions. Provide an online FAQ section, which would serve to answer some of the most common problems.

Do some advance training on the software before student teaching begins.

More staffing and support is need through the process.

Recommendations:

Strengths of the pilot include the perception among many participants that the digital portfolio enhances reflection on the student teaching experience, encourages the development of new and useful technical skills, and may have potential to include digital video clips to reflect clearly the relation of teacher behavior to INTASC and content area standards. Potential public school administrators are often impressed with the ability of a candidate to manage technology in a meaningful way in an educational setting. There was an evident feeling of accomplishment and satisfaction among all candidates ***after the portfolio was completed successfully***!

Limitations include the level of anxiety that exists among student teachers at the University of Indianapolis and the additional time commitment that was noted by several participants. Training and technical support continue to be problems. Instruction in the use of the DreamWeaver software took many hours. Survey comments from participants indicate even more support was needed. Eventually participants must provide their own Zip disks and CD-RW discs.

The maximum number of student teachers expected in one semester at the University of Indianapolis is approximately 60. There is no computer lab on campus of sufficient size to allow all candidates to work at the same time. The number of scanners, digital video cameras, video editing equipment and CD burners must also be adjusted to meet the requirements of a full-scale digital portfolio effort.

One of the goals of this project was to improve student reflection. It was our hope that the video editing process to obtain short “30-second” clips of one’s teaching would help some students become more reflective about how their actual teaching met or failed to meet INTASC standards. Given the restraints of the project and the availability of equipment, it was decided that students would record their videos on Analog VHS and digitize “selected” portions and convert these portions to short Quicktime Movies that could be inserted within their portfolio.

Very few students digitized any video. Those who did digitize video seemed to digitize video indiscriminately. One University Supervisor did however take the time to help his student teachers by creating a few short movies that they could use in their portfolio. Given the short production time in creating these portfolios few students saw the video as an integral part of their reflections. The few students who did have digital video examples remarked on the benefits they saw to the rest of the portfolio process and how much they would encourage others to add video to their portfolios.

"*Hear* no IT Concepts, *See* no IT Concepts", *Speak* no IT Concepts" ….(Lessons Learned on getting new IT students excited about learning new Networking and Database IT concepts)

Victor G. Williams
Macon State College
100 College Station
Macon, GA 31206
478 757 7087
vwilliam@mail.maconstate.edu

Abstract

In response to government proclamations in recent years,4 colleges and universities in the United States increasingly are becoming aware of the need to develop the competence and confidence of new teachers and new students during their first years of service and students taking classes for the first time outside of their major field of study. In most universities, it is a requirement for students to take courses outside of their major field of study. With students taking courses they are not familiar with and being exposed to for the first time, it is important for students get a good start in such courses. There are many factors that must be taken into account when introducing students to new courses outside of their major. The teaching style and learning style are two of the concepts that must be taking into account.

Introduction

How am I supposed to understand this class? I have never seen a network before. What is a database? I cannot *hear* it running, I cannot *see* it, and I really can not *speak* it". How am I support to learn this stuff? Did I pick the wrong teacher?

Sounds familiar, doesn't it?

Many first year IT students probably have ask the above questions and more. Or, they have had a look on their face and you can see the above question rolling around in their heads.

Yes, the function of a college is to teach students to think (to paraphrase Newman5). Before a faculty member can begin *motivating* students to think, the *hygiene factors* need to be in place (to paraphrase Herzberg6).

According to Schroeder 7"faculties nationwide are bewildered and frustrated with the students they see in their classrooms today. Unfamiliar with many of the new characteristics, they see contemporary students as hopelessly under prepared, or less bright or motivated than previous generations. Clearly, the ways contemporary students view knowledge and derive meaning are

4 National Mentoring Month 2003 Proclamation.
5 John Henry, Cardinal Newman, "On education," ***The Idea of a University***, Yale University Press, 1996.
6 Frederick Herzberg, ***The Motivation to Work***, John Wiley, 1959
7 Charles Schroeder, New Students – New Learning Styles, 1993

vastly different from those of their instructors. These differences may be one of the causes of the low morale, sense of discouragement, and tendencies toward despair that are recounted across the country when faculty gather to discuss their roles as teachers".

Schroeder 8 also says that most faculties have chosen their careers for love of learning rather than for the extrinsic rewards. How, then, can we cope with students who do not recognize the same love? Must we resign ourselves not only to declining compensations but also to the loss of the joy in teaching and learning? One of my colleagues, a chemist, commented that his senior students were like chipmunks or squirrels, storing away separate little chunks of knowledge; they bad no idea why they gathered these nuggets and no understanding of how they related to each other.

As faculty, we have generally espoused the common belief that students learn and develop through exposure - that the content is all-important. We have been accustomed to a traditional learning process where one who knows (the teacher) presents ideas to one who does not (the student). Many of us prospered under the traditional lecture system, where the focus was on coverage of material through teaching by telling (Schroeder 9). This approach may work for us but it may not work for the majority of today's students. Most students do not like the lecture format because students are changing dramatically. Therefore, we as teachers need to change the way in which students learn the best.

Learning Styles

There are many learning styles as well as teaching styles. According to Ellis10, the theory of people learning differently is a fairly new topic in educational psychology, one that generated research activity in the last decade. Today, many teachers realize that these findings can make a difference in their ability to reach students. Ellis breaks learning into four stages:

Stage 1: Some of us want to know why we are learning things. We seek a purpose for information and a personal connection with the content. This occurs during Stage 1 of the learning cycle.

Stage 2. Some people crave the kind of ideas and facts presented in the classroom. Often such people are not concerned with how the material will relate to their personal lives. Instead, these students are eager to learn for the sheer pleasure of learning. This occurs during Stage 2 of the learning cycle.

Stage 3: Some people hunger for an opportunity to experiment with the knowledge they gain in the classroom. They want to see if the facts they learn actually work in daily life. They ask: Does this idea make sense? Is it usable? Such questions occur during stage 3 of the learning cycle.

Stage 4: Some people are more concerned about how they can use what they are learning making a difference in their lives and the world as whole. These people do well in mixing with others, enjoy group activities, create "on their feet, " and are usually vocal in a group.

8 Charles Schroeder, New Students – New Learning Styles, 1993
9 Charles Schroeder, New Students – New Learning Styles, 1993
10 Dave Ellis, Becoming A Master Student, 1997

Four Learning Style Models

Richard Felder11 breaks learning down into four styles, The Myers-Briggs Type Indicator (MBTI), Kolb's Learning Style model, the Herrmann Brain Dominance Instrument (HBDI), and the Felder-Silverman Learning Style Model.

The Myers-Briggs Type Indicator (MBTI)

According to Felder12, this model classifies students according to their preferences on scales derived from psychologist Carl Jung's theory of psychological types, students may be:

- Extraverts (try things out, focus on the outer world of people) or introverts (thinks through, focus on the inner world of ideas)

- Sensors (practical, detail-oriented, focus on facts and procedures) or intuitions (imaginative, concept-oriented, focus on meaning and possibilities)

- Thinkers (skeptical, tend to make decisions based on logic and rules) or feelers (appreciative, tend to make decisions based on personal and humanistic considerations)

- Judgers (set and follow agendas, seek closure even with incomplete data) or perceivers (adapt to changing circumstances, resist closure to obtain more data)

Kolb's Learning Style model

- Type 1 (concrete, reflective). A characteristic question of this learning type is "Why?" type 1 learners respond well to explanations of how course material relates to their experience, their interests, and their future careers. To be effective with a Type 1 student, the instructor should function as a motivator.

- *Type 2* (abstract, reflective). A characteristic question of this learning type is *"What?"* Type 2 learners respond to information presented in an organized, logical fashion and benefit if they have time for reflection. To be effective, the instructor should function as an *expert*.

- *Type 3* (abstract, active). A characteristic question of this learning type is *"How?"* Type 3 learners respond to having opportunities to work actively on well-defined tasks and to learn by trial-and-error in an environment that allows them to fail safely. To be effective, the instructor should function as a *coach*, providing guided practice and feedback.

- *Type 4* (concrete, active). A characteristic question of this learning type is *"What if?"* Type 4 learners like applying course material in new situations to solve real problems. To be effective, the instructor should stay out of the way, maximizing opportunities for the students to discover things for themselves.

11 Richard Felder, Matters of Style, 1996
12 Richard Felder, Matters of Style, 1996

Herrmann Brain Dominance Instrument (HBDI)

According to Felder13, this method classifies students in terms of their relative preferences for thinking in four different modes based on the task-specialized functioning of the physical brain. The four modes or quadrants in this classification scheme are

- *Quadrant A* (left brain, cerebral). Logical, analytical, quantitative, factual, critical;
- *Quadrant B* (left brain, limbic). Sequential, organized, planned, detailed, structured;
- *Quadrant C* (right brain, limbic). Emotional, interpersonal, sensory, kinesthetic, symbolic;
- *Quadrant D* (right brain, cerebral). Visual, holistic, innovative.

Felder-Silverman Learning Style Model

This model classifies students as:

- *Sensing learners* (concrete, practical, oriented toward facts and procedures) or *intuitive learners* (conceptual, innovative, oriented toward theories and meanings);
- *Visual learners* (prefer visual representations of presented material--pictures, diagrams, flow charts) *or verbal learners* (prefer written and spoken explanations);
- *Inductive learners* (prefer presentations that proceed from the specific to the general) or *deductive learners* (prefer presentations that go from the general to the specific);
- *Active learners* (learn by trying things out, working with others) or *reflective learners* (learn by thinking things through, working alone);
- *Sequential learners* (linear, orderly, learn in small incremental steps) or *global learners* (holistic, systems thinkers, learn in large leaps).

Teaching to all types:

Here are some strategies to ensure that your courses present information that will appeal to a range of learning styles. These suggestions are based on the Felder-Silverman model.

- *Teach theoretical material by first presenting phenomena and problems that relate to the theory* (sensing, inductive, global).
- *Balance conceptual information* (intuitive) *with concrete information* (sensing). Intuitors favor conceptual information--theories, mathematical models, and material that emphasizes fundamental understanding.

13 Richard Felder, Matters of Style, 1996

- *Make extensive use of sketches, plots, schematics, vector diagrams, computer graphics, and physical demonstrations* (visual) *in addition to oral and written explanations and derivations* (verbal) *in lectures and readings*.

- *To illustrate an abstract concept or problem-solving algorithm, use at least one numerical example* (sensing) *to supplement the usual algebraic example* (intuitive).

- *Use physical analogies and demonstrations to illustrate the magnitudes of calculated quantities* (sensing, global).

- *Occasionally, give some experimental observations before presenting the general principle, and have the students (preferably working in groups) see how far they can get toward inferring the latter* (inductive).

- *Provide class time for students to think about the material being presented* (reflective) *and for active student participation* (active). Occasionally pause during a lecture to allow time for thinking and formulating questions. Assign "one-minute papers" near the end of a lecture period, having students write on index cards the lecture's most important point and the single most pressing unanswered question.

- *Encourage or mandate cooperation on homework* (every style category). Hundreds of research studies show that students who participate in cooperative learning experiences tend to earn better grades, display more enthusiasm for their chosen field, and improve their chances for graduation in that field relative to their counterparts in more traditional competitive class settings.

- *Demonstrate the logical flow of individual course topics* (sequential), *but also point out connections between the current material and other relevant material in the same course, in other courses in the same discipline, in other disciplines, and in everyday experience* (global).

The Team Learning Concept:

In an article by David Brown14(www.syllabus.com), it is explained that the team-learning concept is a very good way of presenting classes. Below are some of the techniques that he suggested:

For example, before each class I ask teams of two or three students to submit annotated lists of the five Web sites that at most relevant to the concept of the day.

Instead of asking individual students to respond to study questions at the end of the textbook chapter, ask three students to submit a mutually agreed-on best answer.

14 David Brown, Accounting for Team Learning, 2002

During class, ask teams of three students to create a PowerPoint presentation that uses the concept of the day to persuade a decision-maker to take appropriate action. At the end of each study unit, teams of five students are responsible for creating a web site that explains and uses the concept just studied.

Brown15 also suggests that:

- Keep the teams small, preferably from two to five people.
- Assign specific roles for each team member. For example, in a networking course one team member might serve as the chief information officer, another a chief marketing officer, or a accounting manager and etc. Or, when preparing a PowerPoint presentation, one team member might be responsible for creating the theme, and another for putting the presentation together.
- In addition to submitting a team project (for a team grade), ask each individual to submit a critique of the team project (just as a Justice of the Supreme Court might submit a minority opinion).
- In addition to grading the team project, ask each individual to submit a grade for his or her individual contribution to the team project. This is especially feasible when individuals have been assigned roles within the team.
- First give the assignment to all individual students, and then ask students to work in teams and submit their best-combined contribution.
- For larger, longer-term projects, periodically e-mail team captains to ask how things are going. Meet with groups that are in trouble.
- At the end of the course, ask each student to name three to five students in the class who have helped them the most, and give frequently named students extra credit.

Co- mentoring program can help:

There are other ways that teachers can improve their teaching styles. They can pick up information from other teachers, books, etc. One program that can help is a co-mentoring program. Each participant must be a committed researcher, observer, and team player. For a co-mentoring program to work, both the institution and the co-mentors must reject common assumptions about the mentoring relationship. These common assumptions include:

Only recognized wise men can be mentors.

Mentoring only happens on a one-to-one, long-term, face-to-face basis.

A mentor needs to be 5-10 years older than the mentee.

The person being mentored is the only one to benefit from the relationship.

Mentoring takes more time than most people have available to give.16

15 David Brown, Accounting for Team Learning, 2002

Some better assumptions to bring to the co-mentoring program include:

Co-mentoring is an empirical learning experience.

No one is an expert.

All information is available somewhere.

Everyone can discover the answer to a question by looking in the right places.

Discovering a useful piece of information is rewarding.

Sharing useful information is rewarding.

The best success is collective success.

Broadly speaking, a co-mentoring program also possesses the seven components identified earlier with a traditional mentoring program. Key differences are indicated below.

Information Center

In a co-mentoring program, the faculty information center takes on far greater importance than in a traditional mentoring program. For many mentor-mentee pairings in a traditional program, the information center is an optional source of information that serves to supplement the traditional mentor's experiential knowledge. In a co-mentoring program, neither co-mentor possesses extensive experiential knowledge. For co-mentors, the information center is often the only source of information critical to successful acclimation of the new faculty member.

The meeting place aspect of a faculty information center takes on a special importance to co-mentors. Co-mentoring sessions often involve a group of co-mentors, each of which has a small piece of the teaching success big picture. These group problem-solving sessions often do not fit well in a faculty office. The information center can serve as a neutral territory, away from each participants primary work area, in which co-mentoring discussions are unencumbered by distractions, and a wealth of archived information is immediately at hand in the information center's file system.

Means of Identifying Co-Mentor Expertise

Each co-mentor has some expertise—some piece of the big picture—to contribute to the co-mentoring process. And, as with traditional programs, good mentors should be, generally speaking, people-oriented, open-minded, flexible, patient, and empathetic. However, no particular co-mentor possesses the extensive experiential knowledge to be a traditional mentor. Additionally, each co-mentor is a mentor to numerous other participants and is mentored by numerous other participants. Therefore, a co-mentoring program keeps track of the pieces of expertise possessed by each co-mentor in the program so that propitious temporary co-mentor pairings or groupings can be identified in response to needs brought to the program.

Faculty Development/Assimilation Plan

As in a traditional mentoring program, a co-mentoring program works best when a development committee or administrator is given oversight responsibility. Someone who already sees the big

16 This list is taken from The Myths of Mentoring page of ***The Mentoring Directory.***

picture is in a position to identify who is in need of critical pieces of the success package and to identify who might best supply those missing pieces.

The goals of the faculty development/assimilation plan are the same as those in a traditional mentoring program. In a co-mentoring program, only the achievement process is different. Because of the fluid nature of the co-mentoring process, the development committee or administrator must be chosen with great care. As the saying goes, herding cats is not an easy job.

Conclusion

Colleges and universities in the United States increasingly are becoming aware of the need to develop the competence and confidence of teachers and students learning. On-the-job nurturing and support by mentors can accelerate success and effectiveness among teachers. However, for the students to be successful, the teacher must realize that every student does not learn the same. A teacher has to be flexible and willing to try new things to ensue learning is taking place.

In addition, teachers need to be aware of new technology that is available for the classroom. It is no secret that technology can help greatly in learning. Teachers as well as students must learn to Hear, Speak and See new concepts and ideas. In other words, we all must have an open mind when it comes to learning and teaching.

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The Power of Collaboration

Rob Hoyt
Director of Information Technology
Appalachian College Association
210 Center Street
Berea, KY 40403
859-986-4584
robh@acaweb.org
Jim Workman
Director of Information Technology
Pikeville College
147 Sycamore Street
Pikeville, KY 41501
606-218-5308
workman@pc.edu

Background

The Appalachian College Association is a non-profit organization made up of 34 four-year colleges and universities in the central Appalachian region. The member institutions range from under 700 students to over 3,000 students within multi-campus environments. These colleges and universities are located in some of the most beautiful areas in the country, gently carved into the rolling Appalachian Mountains throughout a five state region. Its members share the goal of service to the people of the region through higher education and related services. The Association helps develop and share ideas, information, programs and resources to achieve its goals, which include promoting cooperation and collaboration among its member institutions to serve the people of Appalachia. The ACA functions independently of any one institution to serve all its members equally.

The ACA developed from a grant-funded project at the University of Kentucky over a 10-year period between 1980-1989. In 1990, the ACA became an independent organization, with its own tax-exempt classification status under Section 501(c)(3) of the 1986 Internal Revenue Service Code. Six research universities in the region (University of Kentucky, University of North Carolina, University of Tennessee, West Virginia University, University of Virginia, and Virginia Tech) are affiliated with the ACA. These institutions assist the ACA in reviewing grant and fellowship applications and conducting workshops. The ACA's assets have grown from less than $1 million to approximately $10 million due primarily to the generosity of the foundations that have continued to fund its programs to benefit central Appalachia.

During the initial period of service in the early 90's the Appalachian College Association focused on the support of our member institution's faculty, as this was the focus of the initial project leading up to the formation of the association. After realizing many successful projects in this area it became apparent that there were tremendous avenues available for expansion of the association's focus. The ACA slowly began to diversify the types of programs offered as well as the content within some existing programs. This diversification would lead to the formation of programs such as the "Central Library", the "Appalachian Collegiate Business Programs Asso-

ciation", "Virtual Center", "Laptop Lab", "Multi-Media Lab", and the "Information Technology Collaborative Group". Continuing to grow and expand these programs helped shape the future of the Appalachian College Association as they changed the way in which the ACA supported its faculty. Continuing the ACA's vision that faculty are key to a successful institution, but realizing that underlying foundations and infrastructures were extremely important to the success of faculty and the classroom of the future, caused the ACA to shift a great amount of energy into the following areas.

The Central Library

In 1997 the Andrew W. Mellon Foundation awarded the ACA funding to work with the college libraries, initially using JSTOR as the cornerstone for developing library technological resources for ACA campuses. By the end of 1998, 25 libraries received ACA support for JSTOR, while 3 subscribed independently. Today, the Central Library is the largest project held within the ACA and consistently provides exceptional benefit to the member colleges and universities. This project not only provides financial relief to our small member libraries but also creates a network of librarians among the member institutions that function as a single entity. Programs range from collaborative purchasing of online databases to the centralized hosting of proxy services for each library. Due to the consistent returns and growth the Central Library project has been a driving force in the adoption of centralized services within the Appalachian College Association.

As an example of this demand one of the centralized products currently hosted at the ACA headquarters in Berea, KY are the Library Proxy Servers. This is one of the most recent examples of the power of collaboration the ACA can offer and an example that we believe demonstrates a need to continue such programs. Software costs were reduced through the purchase of one site license, compared to purchasing each individual campus a site license, and immediate financial benefit to the institutions was realized. Hardware costs were reduced through the purchase of 6 systems capable of hosting multiple services, compared to the purchase of 34 systems required to hold each individual service. Thus the power of today's equipment was harnessed to its full extent in order to increase the efficiency of hosting this type of application. In a sense the institutions are outsourcing their needs for technology expansion, yet they are outsourcing to an environment that is essentially "owned" by the institutions. This translates into realized gain as well as administrative control and collaboration.

As the Central Library grows and new projects are developed it becomes one of the largest users of space, equipment, and bandwidth within the centralized structure of the Appalachian College Association's technology adoption. At this time the Central Library program has 8 physical servers hosting multiple services that range from a digital library server to a database of all the faculty members within the association. With the services currently in place and the proposed future adoptions the Central Library is still one of the largest driving forces behind the construction of the ACA technology center and as confidence and knowledge grows so do the possibilities realized by the participating libraries. While technology usage and expectations expand dramatically in higher education and beyond, the ACA is continuing to devote time and energy into the adoption and expansion of the vital resource for its member colleges and universities.

Building a New Foundation

The power of collaboration has produced visible effects within two categories, one being the member institutions and the other being the association itself. Within the institutions there has been a growing "knowledge base" of possibilities. What once was deemed impossible is now entertained as possible until proven otherwise. This effect then causes a more open environment for statements resembling "what if we could do this…" as opposed to earlier times when ideas of a larger nature were not being realized due to a lack of funding and possibly even the time needed to implement. Through this very interaction the association realized that the power of collaboration was now molding the focus of future funding requests. There is considerable need to continue supporting the faculty, but the way in which the support is to be realized is changing. In response to this trend the Appalachian College Association is currently seeking funding that will support the creation, adoption, and use of enhanced technological systems throughout the member institutions.

This funding focus has been labeled, the ACA Quad with the idea that this new focus will be the quadrangle of the member institutions, and just as it does on each campus, it will serve to tie the different areas of emphasis together under one common goal. Under this new initiative the ACA is seeking to increase its ability to provide assistance and support in the area of technology systems and services. Funding in this area will be used to provide on campus support for technology such as bandwidth management, caching, and content filtering all of which are vital to the operation of an institution in today's educational environment. Other major goals within this area include the consistent support for training, meetings, and collaborative ventures of the campus Information Technology staff as well as the continued support of centralized services.

Upon this new foundation or Quad, the Appalachian College Association and its members have begun to build and plan for centralized services such as multiple course management systems, an administrative system, multiple library catalog systems, e-reserve system, streaming humanitarian movies, and other systems yet to be determined by the growing knowledge base. The quad is currently supporting a WebCT server in use by four institutions in multiple states and is expected to increase its institutional usage over the next few months. As programs of this nature continue to grow, the power of collaboration forces the Quad to adopt new technologies and to increase its ability to provide efficient, reliable, and cost effective services. The constant cyclical discovery of new products and innovations by our 34 member knowledge base will continue to drive the power of collaboration which, as stated above, will provide effective positioning of the Quad in order to adjust our focus so that the Association can provide the optimal amount of assistance in order to create the maximum benefit.

Information Technology Collaborative Group

The Information Technology Collaborative Group was established in February, 2002. The group was formed by motivated participants of the ACA Technology forum that met one to two times a year. Four representatives from three of the five ACA states made up the initial Steering Committee that established the goals of the ITCG to be collaboration and support between the IT staff of the schools, to create a new IT staff strand at the annual ACA Technology Summit, and create interest for ACA schools not actively participating to join the ITCG.

Prior to the formation of the ITCG the project creating the most impact within the ACA regarding Information Technology was the Student Technical Assistant (STA) program. The STA program, funded by the Andrew W. Mellon Foundation was established in 1997. The STA program was developed to give students at ACA institutions the opportunity to prove their worth as technicians while fine tuning their skills. Secondly, the STA program assisted the understaffed IT offices with additional help. Annually the program holds technical and non-technical training at two different central sites within the ACA. The technical training consists of hardware repair, software repair, networking, and troubleshooting. The non-technical training consists of honing communication skills and leadership skills among the students. Early on the coordinators of this project established the non-technical side of the training knowing that additional help with hardware and software would be of little value without the communication and leadership skills necessary to collaborate with various students, faculty, and staff that they would come in contact with. Several have dedicated numerous hours to this program to ensure the success of the project, but one IT Director at a school in Milligan, TN has personally given unselfishly to see that the students continue with the opportunity to partake in this program.

With the help of the ACA IT Director, the ITCG has capitalized on the power of collaboration by actively seeking vendors that will work with the consortium to bring the "power of numbers" to small college campuses in Appalachia so they can experience the same price slashing that large universities see with hardware and software. Online stores have been developed specifically for ACA institutions configured in such a way to benefit the needs of the small institutions. The group has also established regular meetings three times a year to share information, network with others, identify common threads, and collaborate on new ideas.

Future project possibilities include assistance in funding numerous endeavors such as: a central library server, central proxy services, central courseware server, central bandwidth, distribution and training for packet shaper/web caching/web filtering devices, and IT staff retreat opportunities.

ACA Tech Summit

The first annual ACA Tech Summit was held in October, 1998. The original Summit was to be a way in which faculty at ACA institutions could showcase their "teaching with technology" projects. Like the original focus of the ACA the original Tech Summit very heavily favored the participation of faculty and the sharing of ideas among faculty. At the second annual ACA Tech Summit in 1999 the ACA STA program took center stage. The idea for STA's from various campuses within the ACA to provide technical support to the faculty demonstrating their products of the classroom was a phenomenal idea. The opportunity for presenters and facilitators at the Tech Summit to have several well trained technical assistants coupled with the prospect of a student providing this support at a major event within the ACA was quite the showstopper. ACA Tech Summit attendees quickly took notice to these well trained, qualified student helpers and quickly gave them the respect that they had so earned.

Over the years the Tech Summit has transformed from a faculty driven two day conference to a three day conference (including pre-conference strand focused events) with activities for stu-

dents, faculty, and staff alike. Hands-on training workshops, technical training, birds of a feather discussions, poster sessions, vendor showcase areas, and numerous presentations are some of the highlights at the more recent Summits. At the 2002 Summit the Information Technology staff saw the birth of a strand for technical staff that provide the foundation for which academic and administrative systems and programs stem from on the 34 ACA campuses. The first year for the strand provided technical training for network administrators in the area of Microsoft's Active Directory. This training provided 28 network administrators and/or assistants the opportunity to learn more about this complex tool free of charge to the institutions. Technical presentations were made available to 108 participants on 7 different topics and wrapping up the strand was the birds of a feather session laying out the foundation for new avenues available through collaborative efforts and new programs like the "Quad Project."

Conclusion

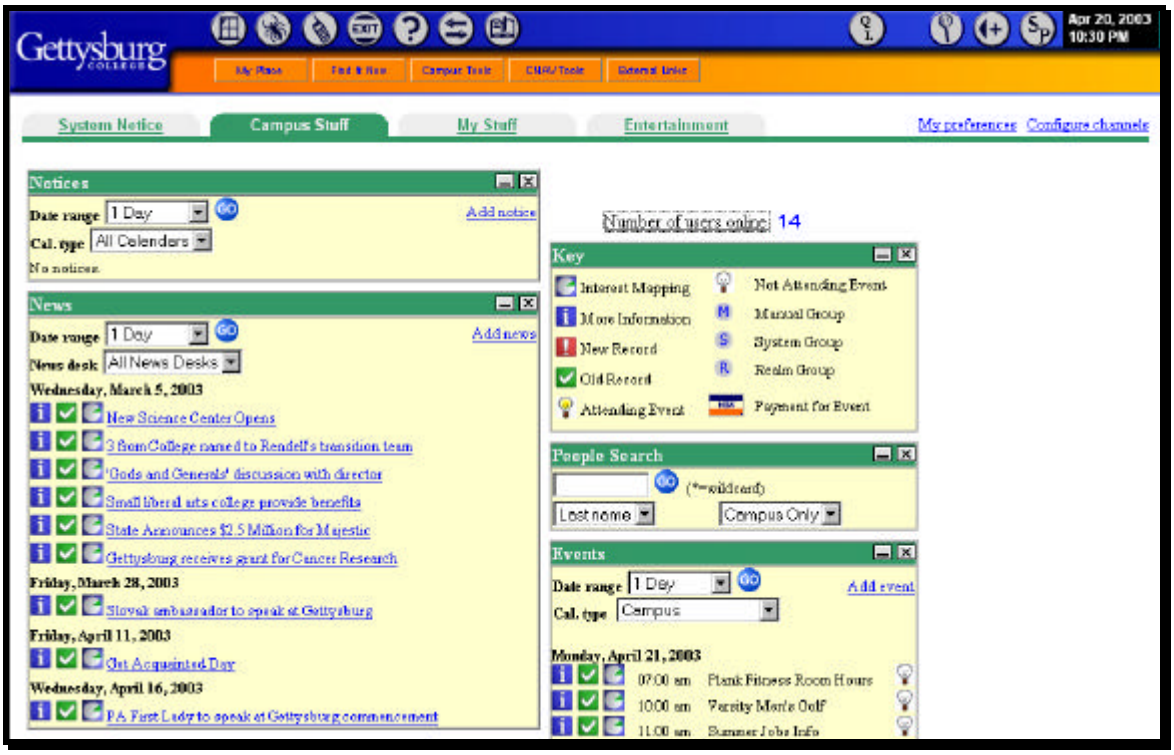
The Appalachian College Association provides 34 colleges and universities throughout Appalachia America with opportunities that would not be otherwise available without the collaborative push that it provides. Limitless are the possibilities that lay ahead for the youth of this region with dedicated faculty and staff working hand in hand with devoted ACA staff supporting the five states of West Virginia, Virginia, Kentucky, Tennessee, and North Carolina.

Gettysburg's Portal System: What We've Learned

William P. Wilson
Information Technology
Gettysburg College
300 North Washington Street
Gettysburg, PA 17325
(717)337-6933
wilson@gettysburg.edu

Introduction

The beauty of a campus portal lies in its ability to provide information from potentially multiple data sources, instantaneously, all in one place. This results in convenient access to data that would otherwise be inaccessible to many members of the campus community. It also provides an opportunity to extend the campus to external constituencies like alumni, parents, and prospective students. They are accessible from anywhere in the world with a browser. The difficulties lie in getting consensus from data suppliers as to who should have access to what data, problems with business processes that result in "bad" data, and working with many offices to determine definitions for certain conditions. Then there is the issue of upgrading the portal to keep its services up to the demands of the campus.



These are the lessons that come with experience. With a homegrown campus portal in full production since 1997, Gettysburg College has learned many lessons—the hard way. Development of CNAV (College NAVigation) began in 1995 and has continued, with modules for employees,

students, and faculty available since conception, and additional functionality added each year—parents and accepted students in 1998, alumni in 1999, student portfolios in 2000, online administrative tools such as helpdesks, inventory management, timesheets, and forms in 2001, an Accepted Students modules in the spring of 2002, and an alumni mentoring module in the spring of 2003.

By their very nature, portals and online course tools continuously evolve, sometimes at a rapid pace. Because new features are continuously added, it's a good idea to develop the business processes early on to allow portal decisions to be made in an inclusive and timely manner. When going through a portal implementation process, schools will learn which business rules are well defined and which are not. Portal implementations tend to bring flaws in the rules to the surface, and a process will need to be in place to handle decisions concerning them. Gettysburg's decision-making process included committees of representatives of all the necessary departments and constituents—including students—with a stake in these decisions. This consensus-based process allows the school to bring new features online quickly without anyone taking issue with them. Gettysburg has also learned that having the portal's mission support the strategic goals of the college gains the involvement of the chief academic officer and the office of the president to support portal initiatives. The provost's request to faculty to keep their biographical information up-to-date in the portal carries more weight than a request from the data organization.

Now that the portal has become a living part of campus, there is a major problem with how priority decisions are made. We continue to get requests for changes and additions, but other than the group that supports CNAV there is no guidance from a representative body for which direction we should move. We are currently looking to develop a Portal Technology group as part of an overall IT committee structure that would contain representatives from all on-campus constituencies to assist with prioritization.

Privacy and Security

With each new portal feature comes a new privacy issue and a tradeoff between usefulness and privacy. In 1997, the big questions at Gettysburg were who should have access to student transcripts, what control individuals should have over their online information, and what rights advisors should have to limit who could see their comments. When, in 1998, the school allowed parents to have an account on the portal and added a parent-student interaction function, it was faced with the new question of whether to allow parents easy access to their sons' and daughters' faculty members and advisors.

Gettysburg has implemented a role-based security system that allows users access to information depending on their "role" at the College. Using role-based security, the institution can grant faculty, students, administrators, alumni, parents, and even newly accepted students their own access privileges, and maintain security for specific groups. Although this type of security is popular in portal development these days, defining who belongs in each "role" is more difficult than it seems, and creates special problems for people who are members of more than one group (what we call realms).

Typical roles include prospective students, enrolled students, parents of students, alumni, faculty, and staff—each requiring different views and security elements for data. Definitions for these roles need to be clear. For example, do retired faculty belong in "faculty" or "staff"? How about trustees and board members—"employees" or "other"? Or what about stepparents? Are they considered "parents" or are only birth parents allowed this role? Is a student who works for the institution a "student" or "employee"?

A surprising number of people have multiple roles, and it is important that the portal be flexible enough to allow these users access to tools germane to each of those roles at the same time. For example, Bill Wilson is a staff member, a sometimes faculty member, an alumnus, and a parent of a student at Gettysburg College. A parent of a student might not have access to a faculty member's home address and phone number, but a faculty member might. Access for someone who is both a parent and a faculty member would have to be determined based on both roles. At Gettysburg, slightly more than 7 percent of the people using the portal have multiple roles, far greater than expected when the portal was under development. Committees and groups constantly meet and continue to refine these roles and how they should interact with any new tools that are released.

The Anatomy of a Portal

In our case, CNAV pieces together ERP data coming from PeopleSoft and BSR, as well as an events database and a picture database. This information is all mapped into our CNAV oracle databases. We use Coldfusion to build all pages we display on the fly. To help other campuses understand the magnitude of issues at Gettysburg, here is a list of the services and tools our portal provides access to:

- Electronic reserves
- Emergency Contact collection and display for staff
- This Semester tool for faculty and students
- Provides all data for the campus directory
- Alumni Mentor tools
- Provides information cards on all members of the portal
- Adviser tools for faculty
- Portfolio tools
- Keeper and maintainer of all manual email aliases
- Digest tool for campus-wide aliases
- Events
- Tools to create and display news items to members
- Timesheet tools for all hourly employees
- Course descriptions including seats open during registration
- Tools to create and present surveys, polls, voting
- Interest searching
- Allow accepted students to register for various things, pay deposit, view contacts for activities they are interested in
- Forms for student prospects to tell us something about themselves

- Advertising of campus services
- Rideboard
- Planning grids for student/advisor planning
- Portfolio tools
- Access to registration and course management systems (automatically handles populating memberships in the course management system)
- Privacy tools
- Progress report (deficiencies) submission and distribution
- Bookmark storage
- Access to transcripts
- Access to financial reports
- Inventory tools
- Helpdesk tools
- Populating public campus webpages with data from CNAV to help with maintaining up-to-date pages (e.g., departmental staff pages)

As can be seen from this list of services and tools, CNAV has become an integral part of the campus.

With the possibility of a great deal of course content soon to be available only online, it is essential to establish a policy outlining access, longevity, and intellectual property ownership for online material before a crisis arises. The policy should be written, distributed, and understood by all parties early on.

At many colleges, honors commissions or other academic fact-finding bodies reference academic materials produced by students or faculty. Dates of modification to the materials, actual copies of content at a particular date, and access rights are critical. In a case involving cheating, for example, copies of two students' online work as it progressed during the semester were considered important evidence. Sometimes intellectual property issues become the focus. Several years ago, a faculty member submitted a compilation of online coursework as part a conference proceedings, without securing permission from a student whose work was part of the paper.

In the era of paper-based course materials, access was controlled by those who controlled the paper. With a growing percentage of materials online and course data contained in databases, access is controlled by a program setting, making the issues much more complex. Now committees of people must decide who outside the course can access online academic information, and under what circumstances. What is the procedure for obtaining access? How long will the school guarantee to back up course data? In the honor code cases at Gettysburg, the school discovered early on that it needed to maintain backups of student work often.

It also discovered that it is prudent to classify online documents and messages, such as those generated by a portal or online learning tools, as "official." With an increasing dependence on the portal and online learning tools for academic progress reports and mid-term grades—and the increasing tendency for students dropped from the academic program to seek formal hearings—it is wise to ensure that any online information carries the same weight and consideration as the institution's paper-based information. Without a clearly worded and distributed policy, a student

might not treat an online notification seriously, and the institution may have no provision for archiving the information. Gettysburg adopted a faculty resolution stating that any e-mail message generated by a faculty member or an advisor carries the same weight as one on paper.

Bugs in the Portal

Problems with administrative system data fed to the portal are routine. The portal itself actually turns out to be one of the best tools to find data problems in administrative systems because the number of people accessing the portal tend to ferret out errors. For instance, users discovered that the data an administrative office used to code faculty on sabbatical resulted in these faculty members being invisible in the campus directory. A faculty member who was looking up a recent graduate noticed that the graduating class of seniors had been entered into the alumni system twice—once by an automatic transfer from the registrar to the alumni system and once by hand by a new employee. And alumni will immediately inform the school when their club membership or giving records are incorrect. Gettysburg is implementing "data sanity checkers" that monitor the data interfaces for abnormalities such as large changes in the number of new or deleted records. In one case, the human resources department arbitrarily restructured the way they stored department names, and in one day hundreds of new departments appeared in the portal. The sanity checker would have caught that problem right away. Of course another issue is to educate the campus that some of these problems are not the result of the portal not working, but with a process in another office on campus; the portal team tends to take lumps for its problems as well as those caused by other offices; while good for those other offices, this clearly calls for some confidence in your data partners on campus.

The Value of Training

Portals are perhaps the largest single piece of software, in terms of users, that a college might deploy, and training is the key to getting full value from it. But training the entire campus community, plus alumni and parents, requires creative solutions. While some of the training time at Gettysburg is spent on tools in the portal—for example, course links, links to advising areas, electronic reserve readings, e-mail aliases—a lot of time is spent reviewing with first year students how to set privacy settings, where to enter their interests, how to join groups, and how to link other Web resources into their portal information. The Gettysburg portal also has recurring training topics to keep people up to date with new features. Web-based training is available so people can access this information at their leisure without having to rely solely on face-to-face training. As new faculty arrive on campus, training covers portal resources that they can populate with additional information about their courses, their expertise, how to link to other Web-accessible information, and their interests. Gettysburg also uses key contacts within academic departments and administrative offices to serve as first-line trainers and problem solvers for the portal software. Finally, the school takes advantage of times when parents and alumni are likely to be on campus to conduct training and information sessions for them.

Poised to Take on Opportunities

Including all appropriate constituencies in the development of the portal increases the likelihood that people will use it. Schools with successful portals continuously look for new opportunities to

integrate instructional materials directly into the portal and to increase the use of these materials by faculty and students. Encouraging faculty and students to use a new service is half the battle in deploying it, and if the new service is first deployed in an easily accessible system, like a portal, it will be adopted faster.

Linking a third-party online course tool—Gettysburg uses Blackboard—into the portal creates a one-stop location; students can access all links to the classes they have registered for in any given semester. This strategy increases student and faculty access to the portal, making it a true resource for the academic program and the campus as a whole.