ASSOCIATION OF SMALL COMPUTER USERS IN EDUCATION

"Continuing Second Quarter Century of Service"

Proceedings of the 2009 ASCUE Summer Conference

42st Annual Conference
June 14 - 18, 2009

North Myrtle Beach, South Carolina

Edited by Peter Smith, Saint Mary's College, Notre Dame, IN

Association of Small Computer Users in Education
"Our Second Quarter Century of Resource Sharing"

Proceedings of the 2009ASCUE Summer Conference
42nd Annual Conference
June 14 – 18, 2009
Myrtle Beach, South Carolina
Web: http://www.ascue.org

ABOUT ASCUE

ASCUE, the Association of Small Computer Users in Education, is a group of people interested in small college computing issues. It is a blend of people from all over the country who use computers in their teaching, academic support, and administrative support functions. Begun in 1968 as CUETUG, the College and University Eleven-Thirty Users' Group, with an initial membership requirement of sharing at least one piece of software each year with other members. ASCUE has a strong tradition of bringing its members together to pool their resources to help each other. It no longer requires its members to share homegrown software, nor does it have ties to a particular hardware platform. However, ASCUE continues the tradition of sharing through its national conference held every year in June, its conference proceedings, and its newsletter. ASCUE proudly affirms this tradition in its motto: "Our Second Quarter Century of Resource Sharing"

ASCUE's LISTSERVE

Subscribe by visiting the site http://listinfo.ascue.org and follow the directions. To send an e-mail message to the Listserve, contact: members@lists.ascue.org Please note that you must be a subscriber/member in order to send messages to the listserve.

NEED MORE INFORMATION

Direct questions about the contents of the 2009 Conference to Janet Hurn, Program Chair, ASCUE '09, Miami University Middletown, 4200 E University Blvd, Middletown, OH 45042, 513-727-3341, conference@ascue.org. Web: http://www.ascue.org

Association of Small Computer Users in Education
ASCUE 2008-2009 Board Members
(years remaining in office including current year)

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Keynote Speaker

Dr. Mark David Milliron is an award-winning leader, author, speaker, and consultant best known for exploring leadership development, future trends, learning strategies, and the human side of technology change. Mark works with universities, community colleges, K-12 schools, corporations, associations, and government agencies across the country and around the world. He serves as Board Chair for the Institute for the Study of Knowledge Management in Education and as a Trustee for Western Governors University. He is also the founder and CEO of the private consulting and service group, Catalyze Learning International (CLI). In addition, he serves on numerous corporate, nonprofit, and education boards and advisory groups; guest lectures for educational institutions nationally and internationally; and authors and moderates the Catalytic Conversations Blog.

Mark brings to this work broad experience, having previously served as an Endowed Fellow, Senior Lecturer, and Director of the National Institute of Staff and Organizational Development in the College of Education at The University of Texas at Austin; Vice President for Education and Medical Practice with SAS, the world's largest private software company; President and CEO of the international education association the League for Innovation; and as Vice President for Academic and Student Services at Mayland Community College (NC).

While teaching at Arizona State, Mark received the International Communication Association's Teaching Excellence Award. More recently, the University of Texas at Austin's College of Education honored Mark as a Distinguished Graduate for his service to the education field. In 2005, PBS named Mark the recipient of its annual O'Banion Prize for transformational work in support of teaching and learning. And in 2007, the American Association of Community Colleges (AACC) presented Mark with its National Leadership Award for his outstanding accomplishments, contributions, and leadership.

Regardless of all of these activities and accomplishments, he will quickly tell you that the most important job and the greatest blessing in his life is serving as Julia's husband, and as father to Alexandra, Richard, Marcus, and Max.

Pre-conference Workshops

Pre-conference Workshop 1
Social Networking Tools for Educators
Presented by: Andrea Han, Miami University Middletown, OH

In this hands-on session we will explore the world of social networking and how these powerful tools can be used to support teaching and learning. Participants will interact with both well know social networking tools like Facebook and LinkedIn as well as lesser known tools that have recently emerged. We will review how other colleges and universities are currently using a wide range of social networking tools and learn from both their successes and failures. We will also discuss how social networking tools utilized in ways that promote online safety and preserve privacy.

About the Presenter: Andrea Han is currently the Educational Technology Coordinator for Miami University Middletown. She also serves as the coordinator for Miami's Center of Online Learning and as an instructional designer. Andrea co-facilitates an international Facebook group and hopes someday soon to convince her grandparents to get Facebook accounts.

Pre-conference Workshop 2
Innovating Your Teaching and Learning with Web 2.0
Presented by: Victoria Waskiewicz and Jean Bennett, Ursinus College, Collegeville, PA

Join us for hands on experience of some new and not so new Web 2.0 offerings. With the variety of Web 2.0 free or affordable resources available, you will experience the following sampling of Web 2.0:

- Synchronous, recordable, video/audio conferencing
- Video screen capture
- Video animations
- Collaboration tools
- Polls and Surveys
- Visual literacy
- Mash-ups and more

Whether you are new to Web 2.0 or an experienced user you will find something to share with your colleagues and students as well as incorporate the technologies into your learning environment that today's students expects.

About the Presenters: Victoria (Tori) Waskiewicz is a Multimedia Instructional Technologists at Ursinus College in Collegeville, PA. She brings knowledge of the corporate real estate industry through developing synchronous and asynchronous eLearning.

Victoria has presented on Web 2.0 Teaching and Learning at her own college as well as other area colleges over the past two years. She is excited about finding new technology and sharing it with the academic community.

Jean Bennett is a Pennsylvania Certified Instructional Technology Specialist, she brings 18 years of PK-12 experience as a Director of Technology and Technology Integrator into her current 3rd year position as a Multimedia Instructional Technologist for Ursinus College. She has presented at several conferences on topics ranging from Digital Natives' Capabilities to Web 2.0 in Teaching and Learning. She was a Semi-finalist in the 2006 Technology & Learning Leader of the Year.

New Organization for the Proceedings

ASCUE initiated a refereed track for paper submissions to the conference in 2008. In fact, at the 2008 business meeting, the membership approved three different presentation tracks: *refereed* with 3 blind reviews for each paper, *regular* where the author submits a paper but it is not reviewed, and *software demonstration* where no paper is submitted and only the abstract is included in the proceedings. To reflect this division, we will divide the proceedings into three sections. The first, up to page 84, will contain the refereed papers, the second, from 84 to 168, will hold the regular track papers, and the last will list the abstracts for the software demonstration track.

ASCUE BOARD OF DIRCTORS FROM 1967 to 2008

At this conference we celebrate the 41st anniversary of the founding of ASCUE at a meeting in July, 1968, at Tarkio College in Missouri of representatives from schools which had received IBM 1130 computers to help them automate their business functions and teach students how to use computers. They decided to form a continuing organization and name it CUETUG, which stood for College and University Eleven-Thirty Users Group. By 1975, many of the member schools were no longer using the IBM 1130, and were requesting to be dropped from the membership lists. At the same time, other small schools were looking for an organization that could allow them to share knowledge and expertise with others in similar situations. The name was changed from CUETUG to ASCUE at the 1975 business meeting and we opened membership to all institutions that agreed with our statement of purpose.

Our historian, Jack Cundiff, has collected the names and schools of the officers for ASCUE and its predecessor CUETUG for the last forty years and we have printed these names on the following pages.

ASCUE BOARD OF DIRCTORS FROM 1967 to 2009

	1967-68	1969-70	1970-71	1971-72
President	Ken Zawodny St. Joseph's College	Howard Buer Principia College	Jack Cundiff Muskingum College	Wally Roth Taylor University.
Program Chair	Wally Roth Taylor University	Jack Cundiff Muskingum College	Wally Roth Taylor University	James McDonald Morningside College
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Librarian				Jack Cundiff Muskingum College
Equip. Coordinator				
Web Coordinator				
Location:	Tarkio College	Principia College	Muskingum College	Christian Brothers

ASCUE BOARD OF DIRCTORS FROM 1967 to 2009

	1972-73	1973-74	1974-75	1975-76
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Librarian	Jack Cundiff Muskingum College	Jack Cundiff Muskingum College	Jack Cundiff Muskingum College	Jack Cundiff Muskingum College
Equip. Coordinator				
Web Coordinator				
Location:	Georgia Tech	Morningside	Furman	Berea

ASCUE BOARD OF DIRCTORS FROM 1967 to 2009

	1976-77	1977-78	1978-79	1979-80
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Librarian	Jack Cundiff Muskingum College	Jack Cundiff Muskingum College	Jack Cundiff Muskingum College	Jack Cundiff Muskingum College
Equip. Coordinator				
Web Coordinator				
Location:	OK Christian	Albright College	Casper College	Dennison University

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Equip. Coordinator				
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Location:	U. Tenn Martin	Coe College	Chatham College	Taylor University

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Librarian	Jack Cundiff Muskingum College	Jack Cundiff Muskingum College	Jack Cundiff Horry-Georgetown	Jack Cundiff Horry-Georgetown
Equip. Coordinator				
Web Coordinator				
Location:	W. Kentucky	Vincennet	Myrtle Beach	Myrtle Beach

ASCUE BOARD OF DIRCTORS FROM 1967 to 2009

	1988-89	1989-90	1990-91	1991-92
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Public Relations	Wally Roth Taylor University	Wally Roth Taylor University	Wally Roth Taylor University	Wally Roth Taylor University
Librarian	Jack Cundiff Horry-Georgetown	Jack Cundiff Horry-Georgetown	Jack Cundiff Horry-Georgetown	Jack Cundiff Horry-Georgetown
Equip. Coordinator				
Web Coordinator				
Location:	Myrtle Beach	Myrtle Beach	Myrtle Beach	Myrtle Beach

ASCUE BOARD OF DIRCTORS FROM 1967 to 2009

	1992-93	1993-94	1994-95	1995-96
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	Carl Singer DePauw University	Rick Huston South Carolina/Aiken	Mary Connolly Saint Mary's College	Paul Tabor Clarke College
Program Chair				
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	Bill Wilson Gettysburg College	Carl Singer DePauw University	Rick Huston South Carolina/Aiken	Mary Connolly Saint Mary's College
Treasurer				
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Secretary				
	Dagrun Bennett Franklin College	Dagrun Bennett Franklin College	Dagrun Bennett Franklin College	Dagrun Bennett Franklin College
Board Members				
	Mary Connolly Saint Mary's College	Gerald Ball Mars Hill College	Gerald Ball Mars Hill College	Rick Huston South Carolina/Aiken
At Large				
	Tom Gusler Clarion University	Tom Gusler Clarion University	Tom Gusler Clarion University	Tom Gusler Clarion University
Public Relations				
	Don Armel Eastern Illinois U.	Don Armel Eastern Illinois U.	Don Armel Eastern Illinois U.	Peter Smith Saint Mary's College
Librarian				
	Jack Cundiff Horry-Georgetown	Jack Cundiff Horry-Georgetown	Jack Cundiff Horry-Georgetown	Jack Cundiff Horry-Georgetown
Equip. Coordinator				
Web Coordinator				
Location:	Myrtle Beach	Myrtle Beach	Myrtle Beach	Myrtle Beach

ASCUE BOARD OF DIRCTORS FROM 1967 to 2009

	1996-97	1997-98	1998-99	1999-2000
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Past President	Mary Connolly Saint Mary's College	Mary Connolly Saint Mary's College	Carl Singer DePauw University	Bill Wilson Gettysburg College
Treasurer	Tom Pollack Duquesne University	Tom Pollack Duquesne University	Tom Pollack Duquesne University	Tom Pollack Duquesne University
Secretary	Dagrun Bennett Franklin College	Dagrun Bennett Franklin college	Tom Gusler Clarion University	Nancy Thibeault Sinclair CC
Board Members	Richard Stewart Lutheran Theological	Richard Stewart Lutheran Theological	Nancy Thibeault Sinclair CC	Fred Jenny Grove City College
At Large	Rick Huston South Carolina/Aiken	Rick Rodger Horry-Georgetown	Rick Rodger Horry-Georgetown	George Pyo Saint Francis College
Public Relations	Peter Smith Saint Mary's College	Peter Smith Saint Mary's College	Peter Smith Saint Mary's College	Peter Smith Saint Mary's College
Librarian	Jack Cundiff Horry-Georgetown	Jack Cundiff Horry-Georgetown	Jack Cundiff Horry-Georgetown	Jack Cundiff Horry-Georgetown
Equip. Coordinator				Rick Huston South Carolina/Aiken
Web Coordinator				
Location:	Myrtle Beach	Myrtle Beach	Myrtle Beach	Myrtle Beach

	2000-01	2001-02	2002-03	2003-04
President				
	Carol Smith DePauw University	Fred Jenny Grove City College	Nancy Thibeault Sinclair CC	Barry Smith Baptist Bible College
Program Chair				
	Fred Jenny Grove City College	Nancy Thibeault Sinclair CC	Barry Smith Baptist Bible College	George Pyo Saint Francis College
Past President				
	Dagrun Bennett Franklin College	Carol Smith DePauw University	Fred Jenny Grove City College	Nancy Thibeault Sinclair CC
Treasurer				
	Tom Pollack Duquesne University	Tom Pollack Duquesne University	Tom Pollack Duquesne University	Tom Pollack Duquesne University
Secretary				
	Nancy Thibeault Sinclair CC	Kim Breighner Gettysburg College	Kim Breighner Gettysburg College	Kim Breighner Gettysburg College
Board Members				
	Barry Smith Baptist Bible College	Barry Smith Baptist Bible College	David Frace CC Baltimore County	David Frace CC Baltimore County
At Large				
	George Pyo Saint Francis College	George Pyo Saint Francis College	George Pyo Saint Francis College	Jim Workman Pikeville College
Public Relations				
	Peter Smith Saint Mary's College	Peter Smith Saint Mary's College	Peter Smith Saint Mary's College	Peter Smith Saint Mary's College
Librarian				
	Jack Cundiff Horry-Georgetown	Jack Cundiff Horry-Georgetown	Jack Cundiff Horry-Georgetown	Jack Cundiff Horry-Georgetown
Equip. Coordinator				
	Rick Huston South Carolina/Aiken	Hollis Townsend Young Harris College	Hollis Townsend Young Harris College	Hollis Townsend Young Harris College
Web Coordinator				
			Carol Smith DePauw University	Carol Smith DePauw University
Location:	Myrtle Beach	Myrtle Beach	Myrtle Beach	Myrtle Beach

	2004-05	2005-06	2006-07	2007-08
President	George Pyo Saint Francis College	Jim Workman Pikeville College	Lisa Fears Franklin College	George Pyo Saint Francis College
Program Chair	Jim Workman Pikeville College	Lisa Fears Franklin College	George Pyo Saint Francis College	Fred Jenny Grove City College
Past President	Barry Smith Baptist Bible College	George Pyo Saint Francis College	Jim Workman Pikeville College	Lisa Fears Franklin College
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Secretary	Kim Breighner Gettysburg College	Kim Breighner Gettysburg College	Kim Breighner Gettysburg College	Kim Breighner Gettysburg College
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Public Relations	Peter Smith Saint Mary's College	Peter Smith Saint Mary's College	Peter Smith Saint Mary's College	Peter Smith Saint Mary's College
Librarian	Jack Cundiff Horry-Georgetown	Jack Cundiff Horry-Georgetown	Jack Cundiff Horry-Georgetown	Jack Cundiff Horry-Georgetown
Equip. Coordinator	Hollis Townsend Young Harris	Hollis Townsend Young Harris	Hollis Townsend Young Harris	Hollis Townsend Young Harris
Web Coordinator	Carol Smith DePauw University	David Diedreich DePauw University	David Diedriech DePauw University	Blair Benjamin Philadelphia Bible
Location:	Myrtle Beach	Myrtle Beach	Myrtle Beach	Myrtle Beach

	2008-09	2009-10	2010-11	2011-12
President	Fred Jenny Grove City College	Janet Hurn Miami University		
Program Chair	Janet Hurn Miami University			
Past President	George Pyo Saint Francis College	Fred Jenny Grove City College	Janet Hurn Miami University	
Treasurer	Tom Pollack Duquesne University	Tom Pollack Duquesne University		
Secretary	Kim Breighner Gettysburg College			
Board Members	Andrea Han Miami University			
At Large	David Fusco Juniata College			
Public Relations	Peter Smith Saint Mary's College			
Librarian	Jack Cundiff Horry-Georgetown			
Equip. Coordinator	Hollis Townsend Young Harris			
Web Coordinator	Steve Weir Philadelphia Bible			

Location: Myrtle Beach

The "U" in Information Security

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Abstract

Information security continues to rise in importance at all levels and across all domains. Academic and administrative technology innovations often over emphasize the non-human elements of information security. Our educational computing environments are uniquely and ideally positioned to significantly contribute to the best preparation of future information workers and leaders through the advancement of safe and sensible educational computing practices. This advancement can be achieved through better education and most importantly by personal involvement, for you are the "U" in information security.

Introduction

The information age has elevated the importance of information security across the globe. Advances in academic and administrative technology have contributed to improvements in information security, but often do not adequately address the human side of the equation. End users are often their own worst enemies when it comes to information security failures. Numerous organizations, including the government and various news media are reporting an increase in the number of information security failures. Often, the impact of one information security failure cascades into a collection of damages and costly knee-jerk reactions. Consider for example the following reports and scenario that relate data breaches, identity theft and the approaches for dealing with consequential damages.

The Identity Theft Resource Center (ITRC, 2008) recently reported an increase of 47% between 2007 and 2008 in the incidence of data breaches. The term data breach is commonly defined as unauthorized or unintentional exposure, disclosure, or loss of sensitive personal information. One example of the damage that can result from data breaches is identity theft.

The number of identity theft complaints increased by 5% to 259,266 for 2007 and by another 21% to 313,982 for 2008, according to the most recently released Federal Trade Commission ID Theft Clearinghouse report (FTC, 2009, p. 5). Identity theft is ranked in the report as the top consumer fraud complaint category for the ninth year in a row.

The increase in incidence of identity theft has greatly fortified the growth of the identity protection service sector despite the very real challenges that sector faces. For example, Richard Todd Davis, CEO of LifeLock Inc., continues to advertise his social security number and a challenge to anyone to steal his

identity, despite the fact his own identity was compromised (Celizic, M., 2008). According to a recent press release by Hagens Berman Sobol Shapiro LLP, the company has also been named in 13 consolidated lawsuits related to an initial class-action lawsuit that alleges the company defrauds its customers by offering services it cannot legally perform, and by touting a $1 million guarantee that the suit alleges is wildly misleading (Firmani, M., 2009).

Perhaps as a mild form of vigilantism, some are beginning to advocate a much more aggressive approach for dealing with the increasing frequency of data breaches and resulting identity theft stemming from failures of those organizations that have been entrusted with personal information. One such approach, advocated by Matthew D. Sarrel (2009), is to "… hit them where it hurts, in the bottom line" (p. 1) by encouraging victims of identity theft to cancel or transfer their accounts from those entities that have allowed the data breach to occur.

This simple collection of reports and scenario exemplify the significance of the problem at hand. The problem has continued to grow even after it was made clear in the National Strategy to Secure Cyberspace report that "healthy functioning of cyberspace is essential to our economy and our national security. … users need to know the simple things that they can do to help to prevent intrusions, cyber attacks, or other security breaches. All users of cyberspace have some responsibility, not just for their own security, but also for the overall security and health of cyberspace" (DHS, 2003, p. vii). The report contains an outline of "… an initial framework for organizing and prioritizing efforts" (p. vii) to address the securing of cyberspace. Among these efforts is the acknowledgement that "education and outreach play an important role in making users and operators of cyberspace sensitive to security needs" (p. 38). Education, and in turn, educational institutions are viewed therefore as instrumental to bolstering information security for the benefit of the individual and in turn the government and global community.

One of the most efficient and commonly employed methods for bolstering information security in the community at large is through user education that is primarily targeted at raising awareness. According to Jeffrey R. Young (2008) who recently compiled a top-10 list of campus computer-security risks, "user awareness is growing in importance when it comes to computer security" (p. 1). It is therefore essential to raise awareness about information security risks and threats, how best to think and act sensibly when responding to them, and ultimately how to contribute as an educational community member toward the improvement of information security through better education and modeling of appropriate practices. Every member of the community can and must contribute.

The Challenge

Threats to information security exist at very different levels and they will always exist. Charles W. Flink II (2002) captures nicely what has been suggested by so many, namely "… the root cause for 30+ years of failure in the Information System Security market derives from a failure to appreciate one of the most basic principles of security: no security solution is ultimately stronger than its weakest link" (Flink II, C., 2002, p. 1). That is, the greatest threat to information security is usually where knowledge and application of sound risk mitigation practices are weakest. The focus thus changes from the information security experts to the end users who, often unknowingly, engage in practices that exacerbate risk.

The challenge therefore is to mitigate information security risks and threats through proper user education in the many forms that may entail. Sometimes the best way to raise awareness and appreciation of something is through the sharing of good counter-examples. Raising awareness of and modeling appropriate practices while contrasting them against inappropriate practices can often expedite the education process.

While many are somewhat knowledgeable of sound information security practices, they may not be as familiar with the many pitfalls and security mistakes that information security professionals regularly witness and are often charged to rectify. The following counter-example lists may be beneficial to such a population:

"The five worst security mistakes end users make", according to the SysAdmin, Audit, Network, and Security (SANS) Institute (2005):

1. Failing to install anti-virus [software], keep its signatures up to date, and apply it to all files.
2. Opening unsolicited e-mail attachments without verifying their source and checking their content first, or executing games or screen savers or other programs from untrusted sources.
3. Failing to install security patches-especially for Microsoft Office, Microsoft Internet Explorer, Firefox, and Netscape.
4. Not making and testing backups.
5. Being connected to more than one network such as wireless and a physical Ethernet or using a modem while connected through a local area network. (SANS Institute, 2005)

"The ten dumbest things people do to mess up their computer", according to Wyman, Reichert, York, Rietveld, and Paller (2008):

1. Plug into the wall without surge protection …
2. Surf the Internet without a hardware firewall and a software firewall …
3. Turn off the antivirus because it slows down your system …
4. Install and uninstall lots of programs, especially freeware …
5. Keep your hard drive full and fragmented …
6. Open all email attachments …
7. Click on everything …
8. Believe that Macs don't get viruses …
9. Use easy quick passwords …
10. Don't bother with backups. (Wyman, Reichert, York, Rietveld, & Paller, 2008, pp. 1-10)

"10 common security mistakes that should never be made", according to Chad Perrin (2008) of TechRepublic.com:

1. Sending sensitive data in unencrypted email …
2. Using "security" questions whose answers are easily discovered …
3. Imposing password restrictions that are too strict ...
4. Letting vendors define "good security" …
5. Underestimating required security expertise …

6. Underestimating the importance of review …
7. Overestimating the importance of secrecy …
8. Requiring easily forged identification …
9. Unnecessarily reinventing the wheel …
10. Giving up the means of your security in exchange for a feeling of security … (Perrin, C., 2008)

Lenny Zeltzer has prepared a cheat sheet entitled "How to Suck at Information Security" that provides a compendium of information security mistakes in an easy to share and publicize format (Zeltzer, L., 2008).

These counter-examples are useful not only as educational aids, but also for clarifying the challenge involved in raising awareness in and better educating the user population about proper information security practices. Sometimes, the risks and threats to information security are not as easily understood or are so clouded in hype that it becomes very challenging to users to discern the most appropriate course of action. What is also needed is a way for users to think and act in a sensible way about choices related to information security.

Thinking and Acting Sensibly

Maintenance of the confidentiality, integrity, and availability of information is the primary goal of information security. It is achieved through protection of information and information systems from unauthorized access, use, disclosure, disruption, modification or destruction. The allocation of resources to the achievement of this goal most often involves the process of risk assessment and management, of considering information security not as absolute, but as something involving trade-offs.

Bruce Schneier (2003) reminds us in his book *Beyond Fear: Thinking Sensibly about Security in an Uncertain World* that "there's no such thing as absolute security" (p. 17) and that the degree of security we seek is dependent upon what we are willing to give-up or trade-off to achieve it. Convenience is often the factor that most often is exchanged for increase information security. Shutting down or logging off from a computer whenever you step away from it is inconvenient, but it greatly reduces many risks to information security.

Schneier presents a five-step process to demystify and make explicit the choices and trade-offs being considered when addressing security issues. It is not a solution, but instead a methodology for helping one to make choices about all forms of security including information security. The five-step process is actually a collection of questions one should answer in order to avail themselves to sensible choices and tradeoffs. The introduction of this paper posed the data breach as an example of a failure in information security that can cascade into numerous damaging consequences. That scenario will be used to help elucidate the meaning of Schneier's questions:

> Step 1. "What assets are you trying to protect?" (p. 14) The asset of concern in a data breach can be presumed in most cases to be identification information for a collection of individuals. Identification information is therefore the asset that should be protected.
>
> Step 2. "What are the risks to these assets?" (p. 14) The risks to the asset consists primarily of loss of confidentiality through access by unauthorized individuals who can in turn use the information for the purpose of identity theft to commit one or more forms of fraud (e.g., credit fraud).

Step 3. "How well does the security solution mitigate those risks?" (p. 14) The given scenario is non-specific in this situation, but clues about how well security solutions mitigate these risks are contained in the ITRC report "… only 2.4% of all breaches had encryption or other strong protection methods in use. Only 8.5% of reported breaches had password protection. It is obvious that the bulk of breached data was unprotected by either encryption or even passwords." (ITRC, 2008, p. 1) The ITRC does not consider in its reports of data exposure those records that have been encrypted but does include those records that are password protected. This is probably due to the fact that data is not actually exposed until it has been decrypted. One may therefore presume that encryption or other strong protection methods are more effective in mitigating the above identified risks when compared with password protection alone. One should also remember that even the strongest of protection methods are insufficient in completely mitigating all risks.

Step 4. "What other risks does the security solution cause?" (p. 14) Again, the given scenario is non-specific in this situation, but by focusing on password protection as a candidate security solution one can conjecture as to the additional risks this solution imposes. As Schneier points out, "this question addresses what might be called the problem of unintended consequences" (p. 14) and it may therefore be difficult at first to appreciate how the use of passwords imposes some additional risk. Consider for example the relation between the often misguided belief that simply having a password will ensure protection and the effects of poor password management and use practices. Users who are required to utilize passwords may actually decrease their vigilance over information security by presuming the use of a password will guarantee information security. The reduction in vigilance may impose risk above and beyond the level that which exists when passwords are not required.

Step 5. "What costs and trade-offs does the security solution impose?" (p. 15) Continuing with the given non-specific scenario and the focus on password protection as a security solution it is possible to explore the concomitant costs and trade-offs. One cost associated with password protection is the inconvenience to access imposed upon users. It would be much more convenient for users to granted access unimpeded by passwords. Additional costs are present in the form of users' time and energy in properly managing their passwords by, for example, changing them often and remembering them. These costs are being exchanged for improvements to information security through the reduction of the risks associated with the loss of confidentiality of identification information for a collection of individuals.

Despite the appropriateness and practicality of Schneier's five-step process he reminds all that "good security uses technology, but centers around people" (p. 145). The human element is crucial to the maintenance of information security. Thus, users and their awareness and knowledge of sound information security practices are once again at the core. For this reason, the academic and administrative leadership communities in education are ideally positioned to best prepare the future information workers and leaders.

The ingredients to improving information security include, raising awareness of the risks, threats, and possible damages resulting from failures in information security, raising awareness of proper information security practices through modeling and sharing of effective examples and counter-examples, and personally contributing to the creation of a climate and culture of sound information security practices

within our educational environments. The overall aim is to best improve information security through proper education and the advancement of safe and sensible educational computing practices.

A Call to Action

Knowledge of what needs to be accomplished is only as valuable as the knowledge of how it will be accomplished. One does not have to be an information security professional to contribute to the solution. Similarly no organization or community should allow itself to rely solely on such individuals to maintain information security. The solution lies in community involvement and contributions that can be made at all levels and through all styles of learning. Numerous resources have been created since the first national call to action and they are readily available for immediate use or implementation.

The educational resources and tools listed in Table 1 are only a small sampling of what is currently available for information security. They have been selected because they represent the breadth of what is available and because of the variability in demands placed upon the individual who can best use or implement. For example, the website models are best utilized by individuals within the educational organization who have web site development knowledge, skills and access. Awareness videos, on the other hand, can be utilized by virtually any individual within the organization.

Category	Educational Resource/Tool
Videos	Award winning videos to improve information security awareness (EDUCAUSE/Internet2 Computer and Network Security Task Force and the National Cyber Security Alliance) available at http://www.researchchannel.org/securityvideo2007/
Games	Cyber Ciege (Naval Postgraduate School and Rivermind, Inc.) available at http://cisr.nps.navy.mil/cyberciege/ Cyber safety games (OnGuard Online) available at http://www.onguardonline.gov/games/overview.aspx Privacy Playground: The First Adventure of the Three CyberPigs (Media Awareness Network) available at http://www.media-awareness.ca/english/games/privacy_playground/
Website Model	Five elements for a Successful Security Website (EDUCAUSE/Internet2 Computer and Network Security Task Force) available at https://wiki.internet2.edu/confluence/display/secguide/Operations+Security#OperationsSecurity-5elements

Community/User Awareness Models	Resources for Community Awareness through K-12 Schools (Purdue University Center for Education and Research in Information Assurance and Security (CERIAS)) available at http://www.cerias.purdue.edu/education/k-12/community_awareness/ Model user awareness programs and materials (EDUCAUSE/Internet2 Computer and Network Security Task Force) available at http://www.educause.edu/HigherEducationResources/8767
Currency Practice	National Cyber Alert System Bulletins & Alerts (US-CERT) available at http://www.us-cert.gov/cas/index.html Security Awareness Tips (The SANS Institute) available at http://www.sans.org/tip_of_the_day.php?utm_source=web-sans&utm_medium=ImageReplace&utm_content=TipofDay_BigExPoint&utm_campaign=HomePage&ref=3626
Utilities	Password Safe (SourceForge.net) available at http://passwordsafe.sourceforge.net/ Gnu Privacy Guard (GnuPG) OpenPGP implementation (Gnu Project, Free Software Foundation, Inc.) available at http://www.gnupg.org/

Table 1: A small sample of educational resources and tools for promoting information security awareness and appropriate practices.

No matter which of these resources or tools a user elects to implement or utilize to improve their own information security, they will also be fostering in their colleagues a culture of improved information security through heightened awareness and modeling of appropriate information security practices. Active acceptance and promotion of such efforts by the academic and administrative leadership greatly advances this process.

Conclusion

Information security continues to grow in importance across the globe and it is viewed by our nation as a key aspect of the healthy functioning of cyberspace which is, in turn, viewed as essential to our economy and national security. Innovations in academic and administrative technology aimed at improving information security require concomitant advances in the awareness and education of the user population in order to achieve maximum effectiveness. Allowing oneself to be the "weakest link" is becoming more intolerable by the community at large in our increasing information age society. Social norms and expectations regarding information security are continuing to evolve. As these change over time, modifications to the legal system will also evolve to help reinforce them. Through community involvement, appropriate information security practices will supplant those that are inappropriate and society will be better for it.

Information security is not absolute but instead relative. It requires one to consider and make trade-offs. Convenience is often the factor that most often is exchanged for increase information security. Bruce Schneier's five-step process may be used to demystify and make explicit the choices and trade-offs being considered when addressing security issues. It is not a solution, but instead a methodology for helping one to make choices about all forms of security including information security.

Educational computing environments are ideally positioned to foster and promote improved information security through better education and modeling of appropriate practices in all users. Those who serve in academic and administrative leadership positions within these environments can and must contribute to the creation of a climate and culture of sound information security practices within our educational environments. Every individual, no matter their role in the educational organization, can contribute in their own way. The contribution can be as small as simply raising one's own awareness and refraining from engaging in inappropriate information security practices. Remember, improvements to information security are needed and made possible through better education and most importantly by personal involvement, for you are the "U" in information security.

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The Effectiveness of Podcasting on Achievement in Principles of Accounting

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Abstract

Podcasting is a relatively new and yet unproven technology, especially when pertaining to higher education. The goal of this research was to address the issue of the educational significance of podcasting review sessions in Principles of Accounting I, by systematically conducting quantitative research to build a case for its efficacy. The purpose of this study was to determine if podcasted review sessions aided students' examination achievement. Although the results were not statistically significant, data collected, in the form of student questionnaires, indicated greater student engagement in the experimental groups than in the control group. Another experimental result yielded that students in the experimental groups did achieve higher exam averages than those in the control group. Findings also indicated that students from the digital generation enjoyed the mobile nature of podcasts. These results should serve as a catalyst for those in education to adopt podcasting as a viable instructional medium.

Introduction

As the age of information infiltrates every aspect of our lives, teachers are seeking alternatives to connecting with their students in ways other than in the traditional classroom. One way to make this connection is to infuse educational technology into the curriculum. The use of educational technology in post-secondary education continues to grow (Bates & Poole, 2003). Not only do students want relevant information, they want it at their convenience. Teachers who use multiple media in their classrooms which incorporates sounds, words, and pictures can assist their students to expedite the learning process and better retain the material (Moreno & Mayer, 2002). Podcasting offers a way for teachers to connect with their students, even when they are not in the classroom.

Podcasting is a relatively new and yet unproven technology, especially when pertaining to education. A podcast is a way of distributing multimedia files, whether it is audio or audio/video over the internet using Really Simple Syndication (RSS), a standard web feed format, so that one can play it back on a computer or an MP3 player. The term podcast is derived from combining Apple's iPod (Pod) media device with the term broadcasting (cast) (Bennington, 2007). Students today are digital natives and often carry a multitude of communication devices (Haugen, 2007). They demand instant gratification and frequently are auditory learners (Haugen, 2007). Because of these phenomena, podcasting seems to be an appropriate way to better reach students.

Since podcasting is a relatively new medium in the arena of education, much has been written on the creation and dissemination of information through the medium; however, there has been little quantitative research to attest to the educational relevance of podcasting. Teachers and students alike are looking for new ways in which technology can be integrated into their classrooms. Podcasting is one simple way to incorporate educational technology in a non-threatening way to both students and faculty.

Students who are currently entering the world of higher education have a different set of expectations than did students in the past (Baird & Fisher, 2006). They thrive on multitasking and expect that the technology devices that they use in their everyday lives be a part of their educational process (Baird & Fisher, 2006, Skiba, 2006). As a consequence of these expectations, French (2006) states that podcasts can assist in giving students wireless access to information where and when they desire to attain it.

Lum (2006) said that 80% of incoming freshmen in the 2005-2006 college year had at least one type of device that was able to receive podcasts. According to the Pew Internet and American Life Project (2007), 93% of teenagers use the internet. Additionally, 64% of those teenagers who are online have participated in at least one type of content-creating activity on the internet (Pew Internet and American Life Project, 2007). Students are not only retrieving information and entertainment from the web, they are now beginning to create it.

Podcasting has become so ingrained in popular culture that the New Oxford American Dictionary gave the entry the word of the year honor for 2005. The definition provided by this dictionary is "a digital recording of a radio broadcast or similar program, made available on the Internet for downloading to a personal audio player" (Oxford University Press Online, n.d., para. 1). This trend in popularity has only grown in recent years and has spread to include news organizations and education.

One of the main reasons for the popularity of podcasts is the ease of creating and disseminating information. One only needs to be able to speak into a microphone and have minimal computer skills to be able to create a podcast (Potter, 2006). A student, with minimal effort, has the ability to download this file onto their computer or portable MP3 device (Skiba, 2006). The student, in turn, has access to this information any time of day or night. Using this simple process, educators can add depth to their lectures, create an audio study guide, or provide feedback to their students. These examples are only a few ideas of how podcasting is used.

Problem Statement

The problem the researcher focused on was, "Will review session podcasts enable Principles of Accounting I students to perform better on examinations?" There are no studies that have yet quantitatively proven podcasting as being effective as an educational tool. There are many of those who have experimented with podcasting in one form or another, but none who have yet to prove its relevance to the educational arena. Anecdotal evidence abounds throughout the literature; however, a gap exists between those who have used podcasting in its various forms and have praised its merits and those that have actual proof of its effectiveness. By attempting to prove that podcasting has statistical educational merit, it is this author's hope to present a call to arms to those in higher education to consider podcasting to enhance their students' performance.

Methodology

This study was a quantitative, quasi-experimental study which had the aim of identifying the effectiveness of podcasting review sessions on the examination scores of Principles of Accounting I students at Thiel College. The goal of this research was to address the issue of the usefulness of podcasting review sessions in education by systematically conducting quantitative research to build a case for its efficacy in higher education. In conducting this research, it was conceivable that the results would transfer to other levels of education, thus proving that podcasting has a viable future in the academic realm.

This study consisted of three experimental groups and one control group. A total of 112 students were involved in this study. The experimental groups consisted of 79 students who received podcast review sessions before each of their three chapter examinations and final examination. The results of an initial chapter examination served as a means of determining the equivalency of the groups. The podcasts were uploaded and made available for each student on the Blackboard Course Management System.

The control group consisted of 33 students. This group did not have any access to the podcasts. The control group had the same instruction as the experimental groups, so the study would not be compromised. This group was chosen at random, to ensure experimental control.

The use of Blackboard enabled the researcher to track the viewing and access of the students to the podcasts, adding relevance to the study. Student scores on examinations were collected and computed via SPSS to determine their statistical significance. In addition to the quantitative testing data, a brief survey was administered to the students in the experimental groups, in order to gauge their opinions as to the relevance and benefits of the podcast review sessions.

To determine if differences existed among the groups on examination scores, four one-way ANOVAs were conducted to determine statistical significance at $p < .05$. The independent variable was the podcast, while the examination scores served as the dependent variable. All students in the control and experimental groups took each test.

The Study

All students in this experiment have their own laptop computer, provided by Thiel College's laptop initiative, and were subscribed to and used Blackboard Academic Management Courseware. Many of the students also had their own personal MP3 players. The students in the experimental groups were prompted to log onto Blackboard, using their college supplied usernames and passwords, and either listen to or download the podcast to listen to at a later time. Each of the podcasts was available to the students five days prior to the exams, and the listening of the podcast was to take place prior to the exams.

There were three chapter exams which had podcasts available for students to listen to in preparation for each exam. Each of these chapter exams consisted of 50 multiple-choice questions worth two points each, thus the number of points awarded for each chapter exam was 100. The students were allowed one hour and 25 minutes to complete the chapter exams. The final exam was cumulative in nature and also consisted of 50 multiple-choice questions worth two points each. All students were allowed two hours to complete the final exam.

Podcasted Accounting Review Sessions

The podcast review sessions included audio reviews of each of the chapters that were included on each test. The first test podcast was 17 minutes and 29 seconds in length. The podcast for test two was nine minutes and 58 seconds in duration. The podcast review for test three ran 19 minutes and three seconds in length, and the podcast for the final examination ran much longer, since it was cumulative. The duration of the podcast for the final was 29 minutes and 37 seconds.

Research Questions and Results

RQ1: The first research question that this study focused on was, "Is there any educational and/or statistical merit to offering review podcasts to Principles of Accounting I students?" A one-way ANOVA was performed for each test with access to podcast serving as the independent variable. The results showed there were no statistical differences ($p > .05$) between those students receiving the review podcasts and those who did not receive the review podcasts.

RQ2: The second research question that was asked in this experiment was, "Will review podcasts improve test scores for students in Principles of Accounting I courses?" To measure this question, mean test scores were calculated from control (no podcast) and experimental groups (receiving the podcast) for each of the four tests. Based on the same four exams that were evaluated in RQ1, the results show that the experimental group outperformed the control group on each of the tests. Table1 illustrates the mean scores for the control group and the overall means of the three experimental groups.

Table 1

Mean Test Scores of the 3 Experimental and Control Groups

	Exam 1	Exam 2	Exam 3	Final Exam
Podcast	80.85	72.26	66.08	78.08
No Podcast	77.23	70.65	65.74	76.06

RQ3: The final research question posed in this study was, "Do students feel the podcasted review sessions were beneficial as an aid to learning accounting?" Data was collected via survey to answer this research question. Each member of the experimental groups was given the survey. Out of 78 surveys distributed, 94% were usable. The survey consisted of seven questions. Five of the questions were set on a Likert scale ranging from one to five as follows: one, strongly disagree; two, disagree; three, neither agree or disagree; four, agree, and five, strongly agree. The last two questions were qualitative in nature and open ended. The data for each question is presented separately in order to address RQ3.

Questionnaire Results

Table 2 outlines the questions, responses, and mean scores of the first five Likert scale questions from the questionnaire. Table 3 and Table 4 show the common themes that arose from questions six and seven.

Table 2

Results of Likert Questions of Student Survey

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree	Mean
	5	4	3	2	1	
I found the review podcasts helpful when studying.	24	36	12	1	0	4.14
The podcasts were easily accessible.	40	32	0	0	1	4.51
I think that more podcasts should be available.	31	32	9	1	0	4.27
I would rather take a class in which podcasts were offered than a class in which podcasts were not available.	25	32	16	0	0	4.12
The podcasts helped me to earn a better grade on the tests.	19	33	19	2	0	3.94

Table 3

Themes Derived From Question Six Responses

What suggestions do you have to make the podcasts more effective? Explain**.**
• The podcasts should go further in depth. • The podcasts should include a visual aspect such as a PowerPoint presentation. • The speaker should speak slower.

Table 4

Themes Derived From Question Seven Responses

Should the podcasts be continued in this course? Why or why not?
• The podcasts help in reviewing notes. • The podcasts were a great summary of material covered in class. • Students had the ability to review material that they missed in class. • The podcasts were helpful in studying the material. • The podcasts helped in narrowing what to study. • We had the ability to listen to the podcasts more than once. • The podcasts provided clarification of misunderstood topics. • The podcasts helped students who were auditory learners.

Conclusions

The purpose of this quasi-experiment was to evaluate the effectiveness of podcasted review sessions on students' grades in Principles of Accounting I. The general reason for conducting this research was a simple, yet motivating one. The author has long been a proponent of using new types of pedagogy to reach his students. Educational technology is one way in which a teacher can add to his or her instructional repertoire. It was decided that podcasting is a medium that students are familiar with, have access to, and use on a regular basis. Lum (2008) wrote in 2005, 80% of freshmen had one or more devices that could download podcasts. That is rather impressive considering that podcasting had only been prevalent since 2004 (Searls, 2005). Many of those students Lum spoke of are now juniors in college and have become quite savvy in the use of podcasting technology and in social networking.

The explosion of social networking has turned the internet from a place where one could retrieve information to one of sharing information. Boulos and Wheeler (2007) named this phenomena Web 2.0. Students are now using the web as a form of networking and socialization. With sites like Facebook, Myspace, YouTube, and countless other networking sites, anyone can contribute information, videos, or ideas that countless others can retrieve. Creating podcasts, vodcasts, internet videos, and blogs is now a simple process that anyone can do. Dede (2004) asserted that due, in part, to these interactive networking sites, students want constant engagement and want to be active learners.

Teachers in higher education need to be aware of this shift from passive to active learners, but they are often stuck in traditional passive teaching pedagogies. Bryant and Hunton (2000) predicted that technological advances will drive a new instructional paradigm. Kelly et al. (2007) even goes so far as to say that traditional classroom lectures should be replaced with other types of pedagogy which is more student centered. When Adadait (2008) conducted a study as to what types of technology accounting educators use, the majority of the respondents replied that they use email, internet searches, and presentation software. Obviously, there is a disconnect between what our students are asking for and what educators are offering in the realm of technology. Even organizations such as AACSB, AICPA, AAA, and AECC are pleading with accounting educators to infuse more technology into their courses.

As the technology becomes more accessible and the equipment easier to use, educators should take it upon themselves to try to include different types of pedagogy into their classrooms. Peluchette and Rust (2005) surveyed teachers in higher education as to why they did not use technology in their classrooms. Some of the reasons reported to them were no institutional incentives to including technology, no available equipment, no policies in place, and no time to learn and incorporate the technology. Spodark (2003) offered that institutions and tenure committees put too much weight on researching and publishing and that developing innovative ways to teach does not influence these committees in the granting of tenure and promotions. Although there is a lack of extrinsic motivation of teachers to incorporate technology, podcasting offers a quick and easy way to ignite a spark in and out of the classroom.

Podcasting is an educational tool that has great potential in the world of teaching and learning. There are a myriad of ways in which one can use podcasts to enhance the educational process. Although the differences between the experimental and control groups were not significant, there was a small difference. In addition, the results of the survey show that the students found the podcasts to be helpful in achieving their course goals. Also, there was an increase in engagement and participation due to the podcasts. Students started to request them.

As an educator, it is easy to get excited about the potential impact that podcasting is having in postsecondary education. The educational needs and wants of students continue to change, and it is the responsibility of academicians to meet the desires and expectations of students. Podcasting provides an easy, effective, and economical way to reach students beyond the classroom walls. This study determined that podcasting is a relevant medium for delivering instruction, based on the positive feedback given by the students for whom the podcasts were developed. The essence of education is engaging students and making connections. One way that educators can accomplish this is by effectively integrating podcasts into the instructional process.

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Hybrid Course Design: Faculty and Student Perceptions

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Abstract

This paper explores the use of a hybrid course design to address the needs of working adult learners in an MBA program. The choice of a hybrid course design allows for the retention of the face-to-face component of traditional courses, while addressing the need for flexible scheduling of working adults. The purpose of this descriptive study was to examine the perceptions of faculty and students in a cohort-based program of study utilizing a hybrid course design. A sample of 150 students and 13 faculty members were surveyed to determine their perceptions of the hybrid course design. The survey addressed four primary areas including course design and content, interaction/collaboration, assessment, and overall learner and faculty perceptions. The results of the study show that, as a whole, students and faculty perceive the hybrid course design is an effective means of delivering course content. Findings from this research would be useful for those who teach or those who are considering teaching courses utilizing a hybrid course design.

Introduction

In today's competitive educational environment, students are looking for alternative educational opportunities. Due to the diverse backgrounds, occupations, and time constraints of students in today's environment, it is necessary for course delivery methods to accommodate these diverse needs without sacrificing rigor necessary for accreditation. Traditionally, course design utilized face-to-face instruction,

which allows for a great deal of interaction between the student and the instructor, but this method requires a significant commitment of time to in-class presence. As the Internet became a popular medium for information transfer, students began exploring the options available for online courses and degree programs. However, a purely online course eliminates the face-to-face interaction desired for effective teaching and learning. To capture the advantages offered by both delivery methods, some schools are now creating courses using a hybrid course design. This method appears to offer "the best of both worlds" (Garnham & Kaleta, 2002).

The most recent National Center for Educational Statistics report on distance education found that "66 percent of 2-year and 4-year Title IV degree-granting postsecondary institutions reported offering online, hybrid/blended online, or other distance education courses" (Distance education at degree-granting postsecondary institutions, 2008, pg. 2) during the academic year 2006-2007. Furthermore, 61% of these same institutions offered online courses, with 35 percent offering hybrid/blended courses, and 26 percent offering other types of distance education courses.

Researchers (Ackerman, 2008; Aycock, Garnham & Kaleta, 2002; Hensley, 2005; O'Malley & McCraw, 1999; Shachar & Neumann, 2003; Tallent-Runnels et al.,2006) in online learning often present the pedagogical strengths and weaknesses of various aspects of face-to-face, totally online, or hybrid (blended) individual course design and delivery including increased flexibility and student access the lack of face-to-face contact with students, the need to adequately assess learning in on-line courses, and the overall perception of hybrid courses among students and faculty. However, much of the information is purely anecdotal (Reasons, Valadares & Slavkin, 2005). Reasons et al. note, "There is a lack of definitive longitudinal research supporting hybrid course designs" (p. 85). To address this gap in the literature, this study examined the effectiveness of a hybrid course design model within an entire program of study using a sample of 150 MBA students and 13 faculty members involved with the MBA program over a five-year period. The authors examined four areas of program design and delivery including course design and content, interaction/collaboration, assessment, and overall student and faculty perceptions of hybrid courses.

Literature Review

Many colleges and universities have chosen to adopt distance and on-line education as a strategic move to adapt to the needs of today's students. Formal education is moving away from faculty-centered and lecture-based designs to a more student-focused, computer-mediated educational delivery system. Early efforts to reach distance-based learners were made primarily through closed-circuit television and correspondence courses. However, with the advent of the Internet, the educational system entered a new age of course delivery. Today, online educational courses include both synchronous and asynchronous delivery methodologies.

Although wholly online courses offer greater convenience and flexibility, evaluation of learner outcomes and satisfaction levels found that something was missing (Hensley, 2005). Wholly online courses did not provide the critical interaction between professor and student that has been deemed as essential for effective learning (Shachar & Neumann, 2003). This reduced interaction between faculty and students, as well as student- to-student interaction contributes to a loss of perceived community (Rovai, 2002) and feelings of isolation (Haythornthwaite, Kazmer, Robins & Shoemaker, 2005).

To minimize the negative aspects of distance and wholly online courses, many educational institutions have adopted a blended or hybrid course design. Colis and Moonen (2001) define blended learning as a mixture of traditional face-to-face and online activities. In this model, instruction occurs in both the classroom and online. Blended courses offer the convenience and flexibility of wholly online courses without the loss of faculty and student interaction. Research that focuses on faculty and student perceptions report that this course design is considered the "best of both worlds" (Dziuban, Hartman, & Moskal, 2004).

When designing a hybrid course, there are numerous aspects that require attention for learning to be successful. These include a balance between online and face-to-face course components, the need for clearly defined course requirements, the need to design elements that will engage the desired depth of critical thinking and learning, and the determination of which assignments are best executed face-to-face and which can be executed online (Garnham & Kaleta, 2002). Hensley (2005) noted that faculty must determine which of their course goals and objectives can be accomplished online, design online assignments to meet these goals and objectives, and ensure integration between the online and face-to-face components of the course.

Another key element of designing a successful hybrid program is the intentional integration of course activities that enhance student-to-student and student-to-faculty interaction. Rovai (2002) notes that it is not only the quantity of interaction that is important, but also the quality and timeliness of interaction. He suggests that it is essential for online instructors to build and nurture a sense of community in online activities. This is accomplished by encouraging students to interact with each other in a cohesive manner and by continually reflecting on the work of individuals as well as the group (Graves, 1992). Although many online interactive learning events such as online discussion and collaborative projects do promote interaction, it is important that faculty continually reinforce, challenge and provoke learners to critically reflect on course concepts and construct new bases of knowledge as they interact in these events (Stodel, Thompson, & MacDonald, 2006). To achieve high levels of interaction and collaboration, faculty must guide, support, and nurture a learning environment (Garrison, Anderson, & Archer, 2001), while also challenging learners to take responsibility for their own learning (Bonk, Kyong-Jee, & Zeng, 2004).

To develop a supportive and effective learning environment where students actively engage in learning opportunities, it is essential that distance education programs, including hybrid design models, create effective mechanisms to assess learning outcomes. Research (Shachar,2008; Shachar & Neumann, 2003) on the assessment of course outcomes suggests that performance in online and hybrid courses was not significantly different from that achieved in traditional face-to-face settings.

One key to effectively achieving high quality outcomes of learning events in hybrid courses is the instructor's ability to manage student assigments, provide relevant and timely feedback, and concerns, and assess student learning against course outcomes (Tallent-Runnels e al., 2006). A variety of assessment methods can be used including peer evaluations, assessment by the professor, exams, collaborative projects, and the use of rubrics (Dziuban et al., 2004; Tallent-Runnels, et al., 2006). Regardless of the assessment techniques utilized by the instructor, it is important to recognize that students' willingness to accept responsibility for managing their assignments and their persistence in

pursuing learning outcomes are also key to their performance in an online or hybrid course (Lynch & Dembo, 2004; Stode et al., 2006). Lynch and Dembo (2004) note that successful learners are active in their learning environment, continually monitor their progress toward their learning goals, and integrate appropriate strategies to achieve their goals. Assessing learning outcomes in a hybrid course design requires an integrative and collaborative interaction between the student and the instructor.

Although distance education has existed for more than a century, student and faculty perceptions about the value and quality of distance-based instruction, compared to that received in more traditional face-to-face settings, continue to be an issue. Shachar and Neumann (2003) in their meta-analysis of the differences between traditional and distance education found that students involved in distance-based education classes academically outperformed those engaged in traditional face-to-face classes. While this is positive news, other researchers (O'Malley, 1999; Stodel et al., 2006; Tallent-Runnels et al., 2006) found that students engaged in a strictly online courses varied in their academic performance. They also found that students perceived there was a lack of social and teacher presence necessary for effective learning.

Rovai and Jordan (2004) found the concern regarding student and faculty presence (i.e., interaction) was lessened in hybrid or blended courses. Their results showed that students felt "the face-to-face weekend classes were a valuable component both academically and in building professional relationships and a strong sense of community" (p. 10). They also found that students engaged in hybrid or blended courses praised the flexibility offered by these courses and the benefits that this course design allowed in enabling them to regulate their own learning. In another study on blended learning, Dziuban, Moskal, and Hartman (2005) note the one consistent finding was the level of student and faculty satisfaction with this course model.

Although continued research in this method of course delivery is needed, it appears that students and faculty perceive there is value in the hybrid course design. Researchers continue to find that hybrid designed courses allow for engagement and collaboration between students and faculty (Rovai, 2002), while also placing learning ownership and success in the hands of the learner (Bonk, Kyong-Jee & Zeng, 2004; Lynch & Dembo, 2004).

Methodology

There is limited longitudinal research on hybrid course design, consequently the purpose of this descriptive study was to examine the perceptions of faculty and students over a five-year period in a cohort-based program of study using a hybrid course design. The sample of this study consisted of 150 current and former students and 13 MBA faculty members.

Data Collection Process

All current and former MBA students and all MBA faculty members had an opportunity to participate in the data collection process associated with this study. The researchers sent an e-mail to all students and faculty members explaining the purpose of this study. Consistent with Milligan College's Human Subjects protocol, respondents were informed of the voluntary nature of their participation. Furthermore,

participants were assured that the information obtained from this research would be confidential and used in this study in summary format only.

Measures

Researchers used two self-report surveys developed using the Zoomerang survey software to gather data about student and faculty member perceptions of hybrid course design. Both the student and faculty surveys contained 19 questions addressing perceptions on hybrid course design. The student survey also included two demographic questions and the faculty survey included two demographic questions and two questions pertaining to faculty teaching preferences. Both student and faculty surveys employed a 5-point Likert scale ranging from strongly agree (5), to strongly disagree (1).

To ensure clarity in the survey instrument, researchers used the following definitions to describe course design and delivery.

- Traditional course – A course where little or no online technology is used. Content is delivered in a face-to-face classroom setting.
- Hybrid course – A course that blends online and face-to-face delivery. A substantial proportion of the content is delivered online, typically uses online discussions, and typically has a reduced number of face-to-face meetings.
- Online course – A course where most or all of the content is delivered online. These courses typically have no face-to-face meetings.

The final survey response rate for the student survey was 70.66% (106 of 150). The response rate for the faculty survey was 84.61% (11 of 13).

Demographics

The sample makeup was 51.9% (55) males and 48.1% (51) females. Of those, 17% (18) of the respondents were between the ages of 20-30; 43% (46) of the respondents were between the ages of 31-40; 37% (39) respondents were between the ages of 41-50, and 3% (3) were over 50 years old. Seventy-three percent (8) males and 27% (3) females completed the faculty survey. Of those, 9% (1) respondent was between the ages of 31-40; 45% (5) were between the ages of 41-50, and 45% (5) were over 50 years of age.

Table 1: Demographic Profile of Respondents

Demographic	Students		Faculty	
	Number	Percent	Number	Percent
Sample Size	106		11	
Gender				
Male	51.9	55.0	8	73.0
Female	48.1	51.0	3	27.0
Age				
20-30	18	17.0	0	0.0

31-40	46	43.0	1	9.0
41-50	39	37.0	5	45.5
>50	3	3.0	5	45.5

Results

For reporting and comparison purposes, the results below will include data gathered from both students and faculty. Tables 2 through 6 present the mean responses to the 5-point Likert scale to determine perceptions of faculty and students on hybrid course design. When comparing means, it is difficult to assess the significance of the differences and the normal tests for significance are inappropriate for this study. For the purposes of this study, we utilized a coding technique similar to one used by Meyer (2007). Examining the data, we assumed that differences in means of less than or equal to one-tenth (≤.1) were essentially equal, thus we designated them as such using the "=" symbol. Differences in means greater than one tenth, but less than three tenths (>.1 but <.3) were classified as *nearly equal*, and designated them as such using the "≈" symbol. Mean differences greater than three tenths (> .3) were classified as *not equal*, and designated them as such using the "≠" symbol.

Table 2: Mean Response for Course Content and Design

Item	Student (n=106)	Faculty (n=11)	Difference
Online learning allows for the presentation of course content in a logical, sequential manner in ways that facilitate learning.	4.02	4.18	0.16 ≈
Online content (including reading, research, review, learning new concepts, and assessment) is as demanding as content delivered in traditional face-to-face courses.	4.45	4.45	0.00 =
Technology (Angel or Blackboard) used for assignment completion (i.e., discussion boards and exams) is easy to use and understand.	4.35	3.73	0.62 ≠
As a whole, course assignments or assessments support the objectives of the MBA program.	4.44	4.45	0.01 =

Discussion

Students and faculty involved in online learning face similar challenges. For faculty it can be the ability to design a course that flows logically and contains sufficient content and quality to meet the learning goals of the course without falling into the "course-and-a-half syndrome" (Skibba, 2006). For students it can be the ability to understand how and why each of the course requirements fit into the big picture

for the course and support their learning goals (Skibba; Stodel et al, 2006). For this study, students and faculty indicate that the course design and content of classes in the MBA program provide challenging and demanding content that facilitate learning. The differences in opinion were small or non-exsistent which suggests that the blending of both online course activities and face-to-face learning events provides a more robust educational experience. The key to achieving outcomes such as this is the ability to develop courses that focus on the learner (Dziuban et al., 2005) and create learning opportunities that challenge student's knowledge base (Stodel et al., 2006).

The only area where a difference of perception occurs is with the use of technology. Although computer-related challenges occur with the technology, students found that the technology used by the program was sufficient and easy to use. Faculty, however, perceived that the technology used for assignment completion was somewhat difficult to use and understand. One explanation for this inconsistency in perception may be the lack of user friendliness of the online learning platform used in this program. Once designed and uploaded, student interface with the learning platform is easy and straight forward.

Table 3: Mean Response for Interaction/Collaboration

Item	Student (n=106)	Faculty (n=11)	Difference
Residency activities were a valuable component in mastering course content.	4.41	4.36	0.04 =
The amount of communication and interaction between student and faculty in a hybrid course was sufficient for effective learning.	4.08	4.27	0.19 ≈
Quality of instructor response in a hybrid course is appropriate to facilitate learning.	4.29	4.27	0.02 =
Technology based communication is as effective as face-to-face communication for responding to questions.	3.58	3.73	0.15 ≈

Discussion

The lack of social teaching presence in hybrid courses is a real challenge for both students and faculty (Rovai , 2002; Rovai & Jordan, 2004). Cutler (as cited in Rovai, 2002) notes that creating a "mutual sense of interaction … is essential to the feeling that others are there" (pg. 18). Dziuban et al. (2005) note that web-based resources and course management systems increase the ease of student and faculty interaction with the end result being that students are more actively engaged in the learning process. In the MBA program, students and faculty perceive that the level of communication and interaction was more than adequate for effective learning, in mastering content, and in creating a sense of community. Although there was little difference in perception regarding the influence that technology had on communication, it should be noted that both faculty and students were neutral in their perception of the effectiveness of technology based communications. These results are consistent with Rovai (2002) who

notes that computer based communications are often perceived as less personal forms of communication and thus contribute to diminishing social presence when compared to face-to-face communication.

Table 4: Mean Response for Assessment

Item	Student (n=106)	Faculty (n=11)	Difference
Required assignments in a hybrid course encourage critical thinking.	4.28	4.36	0.08 =
Required assignments in a hybrid course encourage the application of knowledge and skills learned in class to current business problems.	4.21	4.45	0.25 ≈
The feedback from instructor on graded assignments in a hybrid course enhances learning.	4.11	4.36	0.25 ≈
Instructors in a hybrid course clearly communicated the requirements for the successful completion of assignments.	4.35	4.82	0.47 ≠
Instructor response time to student questions in a hybrid course was appropriate to allow students to complete required assignments in a timely manner.	4.09	4.73	0.63 ≠

Discussion

Dziuban et al. (2005) note that blended courses enhance the development of a community of inquiry. They suggest that this type of course design fosters critical thinking by encouraging collaborative learning. The results of this study suggest that both students and faculty perceive the assignments and learning events in the MBA program contribute to student learning. The areas of disagreement lies in the area of instructor communication related to assignment requirements and response time to questions on assignments. This perception difference is consistent with previous findings of Stodel et al. (2006). Stodel et al. found that student perceptions of faculty feedback on assignments and the timeliness and content of faculty response to student questions was inconsistent with the perception of faculty on these items. Stodel et al. suggests that student expectations may be inconsistent with the reality of an online learning environment. The findings of this study support this contention and may present a future area of research.

Table 5: Mean Response for Perceptions

Item	Student (n=106)	Faculty (n=11)	Difference
Participation in / facilitation of online discussions in a hybrid course is easier than in a traditional face-to-face class setting.	3.08	2.27	0.81 ≠
Hybrid courses meet the need for flexible access to educational opportunities.	4.60	4.64	0.01 =
I believe that using a hybrid course design is more effective than traditional teaching methods.	3.31	3.27	0.04 =
I prefer hybrid courses to traditional face-to-face courses.	3.79	3.18	0.61 ≠
I believe that students can make the same grade in a hybrid course as in a traditional face-to-face course.	4.29	4.36	0.07 =
Students can learn the same amount in a hybrid course as in a traditional face-to-face course.	3.86	4.27	0.41 ≠

Discussion

Overall perceptions by faculty and students on a hybrid course design in the MBA program offer paradoxical views. The results on the value of a hybrid course designs for flexibility in educational opportunities is consistent with previous research (Dziuban et al., 2004; O'Malley, 1999; Shachar & Neumann, 2003). Student perceptions regarding the preference for hybrid courses over traditional course and their perceptions on the level of learning in a hybrid course verses a traditional course was consistent with O'Malley's (1999) findings. O'Malley found that although students liked the advantages of a hybrid course design, they seemed to be undecided in their preferences between online learning and traditional learning. However, faculty perceptions regarding student learning in a hybrid course is much more positive. This is consistent with the findings of Dziuban et al. (2005) who suggest that faculty are very satisfied with hybrid courses and that student learning and performance is equal to or better than traditional face-to-face course settings.

The largest difference in perception was found on the topic of online discussions. Faculty perception regarding the ease of facilitation of online discussions was decidedly negative, while student perceptions regarding the ease of participating in online discussions was neutral. These findings could be attributed to amount of time and preparation required to facilitate the discussion, as well as student expectations regarding their participation in online discussions. Stodel et al. (2006) noted that the expectations, practices and attitudes of both students and faculty may need to be fundamentally altered when participating in online learning.

Conclusions

As a whole, this study found that faculty and student perceptions of the use of a hybrid course design in an MBA program of study is largely favorable. The positive nature of these findings reflect the growth of faculty member's knowledge over the last five years as they refined course content to match learners needs, to reinforce the goals of the MBA program, and address the challenges of teaching in an online environment. Although there were few areas of significant difference in perceptions, the areas that did exist should not be lightly dismissed. It is important that educators working in an online learning environment recognize that they must actively strive to build collaborative environments, coach learners how to learn online, as well as establish the structure necessary for online learning and manage the expectations of the online community.

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From Novice to Expert: Harnessing the Stages of Expertise Development in the Online World

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Abstract

Expertise develops in three stages. In the first stage, novices focus on the superficial and knowledge is poorly organized. During the end of the second stage, students mimic the instructor's mastery of the domain. In the final stage, true experts make the domain their own by reworking their knowledge to meet the personal demands that the domain makes of them. Thus, as expertise develops, learning shifts from acquiring surface knowledge to constructing deep knowledge. Using the teaching of computer programming to exemplify the techniques, types of online and face-to-face learning experiences are discussed that are appropriate as expertise grows and learners gradually shift from making sense of the simple surface features of the domain to acquiring experience through increasingly complex problems that deepen learning.

Introduction

Teaching programming to novices has been seen as a problem for decades (Bennedsen & Caspersen, 2008) and been regarded by some as one of the seven grand challenges of computing (McGettrick, Boyle, Ibbett, Lloyd, Lovegrove, & Mander, 2005). In a well-meaning attempt to bring novices "up to speed" quickly and bypass the frustrations they encountered on their way to expertise, experts may begin introductory programming courses by showing novices the various "tricks of the trade" they have learned or discuss the broad principles of structured vs. unstructured programming. The results are often disappointing as students seem unable to grasp what are to instructors the simplest programming principles at the end of the course (McCracken, Almstrum, Diaz, Guzdial, Hagan, et al., 2001). This paper proposes a theory of expertise development that sheds light on why this communication gap occurs between expert and novice programmers and provides techniques that can be used to bridge that gap.

Expert Mental Organization

Ericsson and Lehmann (1996) define expert performance as "consistently superior performance on a specified set of representative tasks for a domain" (p. 277) by acquiring a set of skills, knowledge, and perceptions that helps them overcome specific critical limits. Yet this improved performance is the product of a working memory that according to Cowan (2000) can attend to just four independent ele-

ments simultaneously. For expertise to develop, more information must be compressed into those four elements to allow capacity for manipulating that information.

Sweller and Chandler (1994) asserted that the principle means of reducing working memory load available to the mind are schema acquisition and automatization. Schemas reduce working memory load by combining simple ideas into more complex ones in long-term memory, where they gradually begin executing automatically (van Merriënboer & Sweller, 2005) and no longer require any working memory.

Dreyfus and Dreyfus (1986) described expertise as a process that moved problem solving from conscious analytical thinking to intuition. They characterized the novice as learning calculations and heuristics and following them exactly without exception. Experts on the other hand lose consciousness not only of how in detail they perceive the situation (the perception becomes simply a feeling) but also of the performance needed to react to it. An expert performer is immersed within the performance and responds smoothly and intuitively. When faced with extraordinary situations or unexpected results from their actions, experts revert to analytical problem solving by employing what they called "deliberative rationality" (p. 36) that evaluates their intuitive responses in a search for better ones.

Zeitz and Spoehr (1989) compared breadth first and depth first learning and concluded that the mental organization of their learners went through three developmental stages to reach the level of expertise. In the first stage, novices focus on superficial characteristics as they train their perceptual abilities. The arrangement and order in which those perceptions are presented eventually have a profound effect on mental organization. In this early stage, the few knowledge chunks novices acquire are generally small, disconnected, poorly organized, and centered on surface characteristics. The domain seems overwhelmingly complex and learners grasp for hooks that relate what they are learning to already-established knowledge.

It is during the second stage that learners wean themselves from depending on previously-mastered knowledge to cope with the new domain and assimilate its knowledge in an "orderly, hierarchical fashion" (p. 328). They can explain how they use its knowledge and skills to solve problems. Since learners tend to organize knowledge in the way it has been taught, one would also expect that their organization of the domain would mimic the instructor's. During the third stage of expertise, continued application of learning to real-world problems and the unique demands those problems make uniquely reworks the domain's cognitive organization and produces complex, personalized expertise. As Dreyfus and Dreyfus (1986) described, experts respond fluidly to the demands of the domain, and they do this by reworking their knowledge to meet the unique demands that the domain has made on them.

Developing Programming Expertise

Computer programming demands complex thinking and creativity, and teaching it has been a continuing challenge to educators. McGettrick et al (2005) cite the effective teaching of programming knowledge and skills as one of the grand challenges of computing. Programming novices will tend to focus first on the syntax (or grammar) of the language of choice and try to program by rules. They examine the language's surface characteristics in the general belief that programming code that looks the same will act the same. Novices have incomplete and poorly recalled chunks of knowledge with sizeable gaps in their overall conceptual organization of the programming domain. This fragmented knowledge and lack of

organization will be reflected in every programming activity in which they engage. Experts by comparison possess well developed and uniquely organized knowledge and skills that evince complexity and allow them to perceive quickly the elements of the problem that are critical to the success of their programs.

If the development of expertise fundamentally alters the expert's mental conception of the domain to the point that thinking becomes so intuitive that experts struggle to explain how they solve problems, then instructors who are experts in their fields will find it nearly impossible to teach their way of thinking to novices. The principle reason why the presentation of domain knowledge from an expert's point of view can be unintelligible to novices is rooted in this change of mental organization. Expertise cannot be taught; rather, novices must themselves engage in experiences which develop the basic principles of the domain and allow their conceptions to first mimic those of the instructor, then evolve into unique domain conceptions that are shaped by their own successes and failures. As expertise develops, learning slowly shifts from acquiring surface knowledge to constructing deep knowledge.

One instructional model that supports the gradual development of expertise is Reigeluth and Stein's (1983) elaboration theory. It proposes that concepts be taught from simple to complex in an order that ensures all prerequisites are mastered as new topics are encountered. The theory centers on the *epitome*, a concrete application that presents a small number of the essential ideas related to a single type of course content (concepts, procedures, or principles). It advocates teaching all the required knowledge or skills together from the beginning and gradually elaborating on them in a spiral fashion rather than introducing concepts individually and amalgamating them toward the end of instruction.

Applying elaboration theory to Zeitz and Spoehr's (1989) stages of expertise, novices should begin with the basic syntax of the language of choice tied together with simplified semantics. Novices will learn the surface characteristics of the language and master bits and pieces of syntax and semantics (The two of which at this stage will seem to novices as essentially the same thing). Once simple syntax and semantics are mastered, more complex program plans and the semantics (or logic rules) of the language apart from the syntax can be introduced. As expertise grows and the learners master programming as taught by the instructor, so, too, should the complexity of the plans that are discussed and the problems that are solved.

Achieving the competence required during the second stage of expertise growth is no simple matter. Learners must make the sizeable leap of understanding the difference between the everyday use of logic (natural logic) and the formal logic employed in programming. While novice programmers do not enter their studies of programming already knowing a computer language, they do enter with years of experience using language and reasoning for everyday problems. Wood (1998) discussed the difference between natural and formal logic, noting that many unsaid implications are often drawn from the natural logic embedded in everyday language that could not be carried over into language employing formal logic.

Learners may have prior experience in solving problems and in writing those solutions down, but the formal logic of computer programming makes previous informal problem-solving experience at best misleading and at worst irrelevant to developing programming solutions. Inevitably, confusion between

their own natural logic and the logic of the programming language produces mistakes (Bonar &Soloway, 1983; Spohrer & Soloway, 1988).

Expert programmers with their unique and holistic knowledge base depend more on a top-down forward design methodology. They tend to retrieve comprehensive design plans from memory and construct high level mental models from them before working on the details (Ericsson & Lehmann, 1996; Rist, 1989; Soloway, 1986). Plans that make up the expert programmer's knowledge structure are unique not only to the experience that the programmer has had, but also apparently even to the kind of programming language in which the programmer was trained (Davies, 1993). As with Dreyfus and Dreyfus' (1986) experts caught in an extraordinary situation, only when a plan must be created from scratch to fulfill a specific program goal does a programming expert use a bottom-up "goal decomposition and plan recomposition" (Rist, 1989, p. 403) strategy.

Mastery of the domain's problem-solving logic it seems must be learned through experience, not through explanation. Soloway (1986), for example, advocated teaching novices to mimic the top-down problem-solving method experts tend to use by having novices break down problems into segments small enough to match stock solutions they would be taught and then combine those solutions into a single comprehensive plan. When Mann (1991) applied Soloway's (1986) strategy, he found that students considered such stock solutions impractical and rigid, and thus not useful. The reason is plain: generic plans are what experts use to solve programming problems. Novices can only apply plans given to them in a means-end manner since they cannot incorporate into their thinking what they have merely memorized and not personalized. It is low-performing novice students who believe that applying memorized algorithms is a key to successful programming (Vodounon, 2006).

Learning Programming in the Online Environment

If immediately instructing novices in expert ways of programming is not productive, what techniques would work, especially in the online environment? Rather than beginning with the templates, plans, or strategic overviews experts use, instructors should first train novices on the syntax of the language and only after they can use it with some facility encourage them to develop a personal stock of plans for solving problems. Cognitive load theory tells us the material should be presented in a way that maintains manageable complexity: neither so easy that interest wanes nor so difficult that learners feel hopeless. Three types of cognitive load have been identified in the literature: intrinsic, extrinsic, and germane (Schnotz & Kürschner, 2007).

Intrinsic load is a measure of the minimum number of elements that must be held in working memory for a concept to be understood. It is not the same as task difficulty and is, in fact, almost completely independent from it (Chandler & Sweller, 1996). Learning a single element may be very difficult but cause little cognitive load, while attempting to juggle multiple simple elements in the mind's eye simultaneously could produce high cognitive load. This load can be reduced in several ways for which the online environment is highly suitable. Here are some examples:

- Information should be introduced only as it is needed by learners so that unnecessary information is not needlessly filling working memory (van Merriënboer, Kirschner, & Kester, 2003).

Examples: Methods for breaking a program into modules can wait until novices are writing programs large and complex enough to need the technique. New terms and procedures can be given links to embedded definitions, explanations, and examples that require only the information and concepts that have been introduced. They can be opened as needed by individual learners to provide the immediacy.

- Individual, elementary programming elements should be studied separately first, and only after they are mastered should groups of elements be studied together to form a single solution (Moss, Kotovsky, & Cagan, 2006**).**

  Examples: Learners can be directed first to lessons that teach elementary programming elements, conditional statements (`if…then…else`) and loops for example, and when mastered as determined by unit assessments, groups of elements (e.g., loops containing conditionals) can be presented in a single lesson. In the same way, syntactic rules can be introduced in their most simplified form and these introductions linked to code statements in future examples that show elaborations of those rules.

- Goal-free tasks that allow learners to master tasks at their own pace such as worked examples, completion tasks, and reverse tasks that start from the answer and work back to the question should be used whenever possible (Sweller, 1994). Such tasks let the novice use scarce working memory solely to learn the task rather than have attention drawn to a goal. This relieves the means-end drive to solve a specific problem at the expense of gaining understanding.

  Examples: Pages can be provided containing goal-free, "sandbox" problems that allow learners to experiment with the programming structures and their parameters. For example, novices can be encouraged to experiment with loops to see how they work rather than asked to write a specific loop that displays the word "Hello" ten times. Examples that let students fill in values into variables can build an understanding of how the structures work while removing the possibility of making syntax errors that can interfere with learning.

- Problems and examples should start simple and grow gradually more complex as learner expertise results in decreased cognitive load. Learners should be shown a variety of worked solutions to programs and observe experts as they solve realistic problems.

  Example: Canned screenshot presentations can demonstrate expert problem solving of a variety of worked solutions, allowing learners to stop and replay the solutions at will.

- Practice should be distributed in bursts throughout the learning. While a few intense periods of massed practice can produce short-term recall, better long-term retention occurs when intrinsic load is reduced by well distributed practice (Fishman, Keller, & Atkinson, 1968).

  Examples: A short exercise or two at the end of each single-topic Web page can help learners apply the new concept and result in long-term retention. End-of-unit exercises can then reinforce the learning from the topic-level exercises. These can be linked to definitions and concept explanations for point-of-learning review as needed by the learners.

- Guiding novices in their learning is more effective than asking them to determine for themselves what to explore (Tuovinen & Sweller, 1999).

  Examples: Guidance is especially important in the online environment, where the emphasis on self-governance and the lack of personal contact with an instructor make the need for self-guiding lessons critical. Completion problems can be provided with links to a network of definitions and tutorials that learners can choose to use to help them diagnose their errors.

Extrinsic load is effort that results from the way the material is presented, its context rather than its content. It can be reduced by removing irrelevant material, thus reducing effort unrelated to learning (Schnotz and Kürschner, 2007). Sweller (1994) speaks to the unintended increase in extrinsic load by techniques often employed in online materials. The first is the use of illustrations. Sweller notes a split-attention effect that significantly reduces extrinsic load when explanatory text is worked into an illustration rather than placed into a separate block of text. The second is the use of repetition. Contrary to what may seem good instructional practice, Sweller (1994) found that including text, diagram, pictures, or other materials that present exactly the same information forces learners to integrate the different media into a single block of knowledge without any material gain in understanding. Instead, the increased extrinsic load resulted in decreased learning. An example of this often used in computer based instruction is reading text to learners while showing it simultaneously on the screen. A better approach would be to use audio to complement rather than repeat the visual information, such as a screenshot recording that uses voice to explain actions that are visible on the screen.

Germane load is the effort expended in building mental structures and automating learning. It can be varied, but the total cognitive load (the intrinsic, extrinsic, and germane loads added together) must not exceed the limit of the learner's working memory. Germane load is an important variable that can be adjusted to align learner expertise to the learning task and keep total cognitive load from being either too high or too low. Having novices rate the difficulty of an assignment using a 9-point Likert-like scale with categories ranging from "very, very easy" to "very, very difficult" can help quantify the germane load (DeLeeuw & Mayer, 2008).

After novices have become sufficiently comfortable working with the language syntax, they should be encouraged to develop their own library of programming solution plans. As noted above, searching for a plan that matches the demands of a given situation is one of the expert's ways of solving programming problems. They may find it easier to do this if instructors first help them to find the focus line to epitomize a piece of code, then gradually expand to groups of focal lines, and finally to see the entire code as a unified solution (Rist, 1989).

The order in which program semantics is introduced also should be set so that the simpler and clearer semantic rules are presented before the more confusing and mentally taxing ones. For example, understanding the difference between iteration and recursion can be a difficult concept for novices. Kessler and Anderson (1986) studied this problem and found that the subjects could learn recursion as easily as they did iteration, but the order in which they learned them was critical. When participants learned recursion first, they simply memorized a set of statements and used a means-end strategy to find a set that solved the problem. When afterward asked to learn iteration, they began with as little understanding as participants who had received no previous instruction. Learning the iterative function first, on the other

hand, made transfer to a recursive problem faster since the iteration training gave some notion of program control. Thus, concepts that engender useable mental models of programs in general and flow of control in particular are essential to learning programming.

Novice programmers tend to come from backgrounds that have included computer use during a considerable part of their lives. We can therefore expect that methods they have learned to solve previous problems they have had with computers should be extended to programming. It is common to restart a computer that has stopped because of a faulty program; thus, novices should also be expected simply to recompile a program that does not compile the first time in an attempt to "reboot" it. Many novices need to be taught explicitly that the error is with their code, not the compiler (Simon, Bouvier, Tzu, Lewandowski, McCartney, & Sanders, 2008). Other instructional techniques that can enhance novice's understanding of semantics include the following:

- Teach novices how to derive the function and output of a program from its code to help make the implicit relations in program code explicit (Corritore & Wiedenbeck, 1991).

  Examples: Present blocks of code to students as online discussion questions that ask them to identify the purpose of the code to help sharpen their code deciphering skill. Links can also be embedded to brief presentations of program plan models to help forge a link between problem solving from a reservoir of strategic plans.

- Teach debugging skills to make the difference between locating and fixing errors clear. Only after experience with faulty programs will learners begin to look deeper into their own programs for the causes of faults. As they lay the cause of program faults more to syntax or semantic errors rather than elements out of their control, they will lower the number of total mistakes they make (Masuck, Alves-Foss, & Oman, 2008).

  Examples: Code tracing exercises, clear and specific (rather than general) explanations of what program statements do, practice with basic programming elements until they are automatized, and emphasis on creating meaningful variable names and comments can develop these skills (McCauley, Fitzgerald, Lewandowski, Murphy, Simon, Thomas, & Zander, 2008; Simon et al, 2008). Presenting error detection exercises as discussion questions can increase the understanding of struggling learners by letting them see the responses of those who have better mastered the concepts.

  Caveat: Having learners to work through program checking routines may prove valueless until they have advanced far enough to understand the processes they are tracing and debugging (Pawley, Ayres, Cooper, & Sweller, 2005).

- Give students opportunities to read code that exemplifies good practice. Novices will implicitly form rules of correct coding syntax and semantics from viewing good code and set up code patterns that can help check against poorly formed code (Servan-Schreiber & Anderson, 1990).

Example: A link on all pages to a library of code examples named to relate to specific concepts taught in the course will guide learners to the help they need when writing their own code. Links to worked examples that learners can modify will give them the opportunity to experiment with the language syntax and semantics.

- Novices should practice building program plans that summarize the key intentions of a program, and they should practice using program plans to reason from them what the program is intended to do (McCauley et al., 2008).

  Examples: Discussion questions centered on specific plans can provide insight to instructors on where individual students are in this vital expertise indicator. They can also give struggling learners an opportunity to observe the thinking processes of more advanced learners. Successive completion problems patterned after specific programming plans that let learners add more code with each problem can provide scaffolding for learners as well as indicate which parts of the plans are the more difficult.

Even if they use these methods, experts can no longer trust themselves to gauge the cognitive load a given exercise will produce in novices. Having transformed clusters of concepts and skills that novices see as complex and vast into fewer, larger, concentrated chunks (Sweller &Chandler, 1994; Schnotz & Kürschner, 2007), what was once difficult as a novice is now done automatically (van Merriënboer & Sweller, 2005) and so seems almost effortless. Letting novices rate the mental effort they used to complete an assignment is a simple way to gain an accurate measure of the cognitive load they experience from the assignment (Paas & Van Merriënboer, 1994).

Conclusion

Expertise is not developed by the simple accretion of knowledge; rather it results from a complete reworking of the mental organization of a domain. By seeing it as such, experts who are also teachers can better appreciate the difficulty a new domain presents to novices and use the stages of expertise development as guides to developing and measuring expertise in novices. Novices become more proficient in using programming elements and their combinations as they grow in expertise, shifting their focus gradually from the surface features to the deep structures of programming. The learning experiences provided to novices must allow for this shift by using instructional techniques that expand, contract, and recycle through old material as needed. The online environment can be designed to respond to these individual learner needs and thereby help turn novices into experts more successfully.

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Integrating Technology into the Existing Education Curriculum

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Abstract

How can technology be integrated into the existing curriculum for teacher candidates, so they see the real benefits of using technology to enhance and extend the everyday task of teaching and learning? Technology has not only become such an integral part of our daily lives, but elementary, middle, and high schools nationwide are integrating technology into the classrooms at a record pace. Teacher candidates need to be prepared to teach students using the most up-to-date software, hardware, and have a familiarity with a variety of tools available to promote learning in the classroom to prepare students for the future. Our higher education institution has designed a technology plan to address these issues, so teacher candidates are prepared for their field experiences and teaching upon graduation.

Introduction

The world of technology is ever changing and making a difference in how we teach. According to Borko, Whitcomb, and Liston (2009), "Technology, in its broadest sense, is the knowledge, creation, and use of tools and techniques to control and adapt to our environment" (p. 4). Koehler and Mishra (2008) refer to using new technologies in teaching and learning as a "wicked problem". In addressing technology, in its broadest sense, and the *wicked problem,* the faculty at Franklin College (FC) took a close look at the existing format for presenting technology to the education majors. We asked, "What is the most effective means in educating teacher candidates to keep up with the fast-paced computer-based technology, along with the necessary technology skills and tools to be prepared to teach?" With the constant advances and changes in hardware, software, and applications it is critical that institutions of higher education prepare their teacher candidates for the complexity of teaching and learning using technology integration as an everyday tool. Integrating technology into the curriculum involves infusing the necessary components to extend and enrich the existing course curriculum. The Office of Technology Assessment (as cited in Abdal-Haqq, 1995) indicated that there is "the need to infuse technology, in a coordinated fashion, across the college curriculum, into the liberal arts content areas where students acquire their subject-area skills and knowledge, as well as the education specialties" (p.2). It is much more common to find technology taught as a stand-alone course or courses, rather than infused and integrated into the course sequence of education programs focusing on authentic learning experiences (Wentworth, Earle, & Connell, 2004). After assessing our needs, we decided to establish a committee to work on a technology plan for infusing and integrating technology into all education courses. Our focus was to build on the existing knowledge of teaching and learning technology to help our teacher candidates be-

come more tech-savvy in the ever changing technology world during their six varied field experiences, education course work, and in their future classroom.

Teaching and Learning Concerns

In the spring of 2006, Franklin College began to take a closer look at the existing use of technology in the existing course curricula. As a result, FC found the need to embed technology into actual practice, as well as present technology via authentic teaching situations. Research shows that infusion of technology should be the goal of institutions (Abdal-Haqq, 1995; Borko et al, 2009; Northrup & Little, 1996). In doing so, we initiated a technology survey to local schools used for field placements, surveyed education majors on technology they felt comfortable using, and assessed the needs of the educational environment. The driving question behind addressing the "wicked problem" was: *What is the most effective method to infuse and integrate technology into existing course curriculum within the education courses to promote authentic teaching and learning*? When first addressing this question, there was only a stand-alone technology course offered to sophomore education majors and only a few education professors used technology in their courses. Being uncomfortable with technology, lack of time to experiment with software and tools, and knowledge of how to effectively integrate technology to meet teaching and learning objectives were areas the education faculty needed to address in order to infuse and integrate technology into our courses. Research shows that several of our concerns are not uncommon among institutions of higher education. According to Don Knezek, ISTE CEO:

> Teachers must become comfortable as co-learners with their students and with colleagues around the world. Today it is less about *staying ahead* and more about *moving ahead* as members of dynamic learning communities. The digital-age teaching professional must demonstrate a vision of technology infusion and develop the technology skills of others.
> These are the hallmarks of the new education leader. (ISTE, 2008a, p. 1).

At the time of implementation, a Technology Standards and INTASC Standards matrix was created to align the International Society for Technology in Education's (ISTE) National Educational Technology Standards and Performance Indicators for Teachers (NETS•T) Standards with the FC course offerings at the various levels. The standards were the basis for the transformation of the teacher education program to equip the teacher candidates with technology strategies within course content through demonstrations and application. Freshmen are exposed to basic technology skills and projects that expand as they progress through the program. Sophomores, juniors, and seniors apply technology during six different field placements and through the immersion of technology in their various education courses. This helps to reinforce what is being discussed and applied in their college content and methods courses at all academic levels. There is a "difference between learning *technology skills* and learning how to *integrate technology* into the classroom," (Wentworth et al, 2004, p. 130). In 2008, ISTE released the next generation of NETS for Teachers which focuses on *using technology to learn and teach* (ISTE, 2008a). According to the NETS•T:

> Effective teachers model and apply the National Educational Technology Standards for Students (NETS•T) as they design, implement, and assess learning experiences to engage students to improve learning; enrich professional practice; and provide positive models for students, col-

leagues, and the community. All teachers should meet the following standards and performance indicators:

- Facilitate and Inspire Student Learning and Creativity
- Design and Develop Digital-Age Learning
- Model Digital-Age Work and Learning
- Promote and Model Digital Citizenship and Responsibility
- Engage in Professional Growth and Leadership (Borko et al., 2009, p. 6; ISTE, 2008b, p.1).

During the process of compiling resources to justify the infusion of technology into the education course content, field placement school corporations were contacted as to what technology tools and skills were expected of new teachers. In addition, Franklin College faculty members attended conferences to further enrich their existing knowledge on how best to infuse and integrate technology into higher education courses. We believe that entering the classroom with a repertoire of technology skills will enhance one's teaching strategies. According to Abdal-Haqq (1995), "The Office of Technology Assessment found that while more than half (K-12 teachers) reported being prepared to utilize drill and practice, tutorials, games, word processing, and publishing applications; less than 10% felt competent to use multimedia and presentation packages, electronic network collaboration capabilities, or problems–solving applications" (p. 2). Information was gathered from various U.S. colleges and universities such as the: University of Maryland, Wabash College in Indiana, Arizona State University, Hope College in Michigan, Vanderbilt University, and University of Virginia to guide our technology integration plan. These schools have been successful in integrating technology into field-based experience by providing authentic teaching experiences in the college classroom and incorporating technology into course assignments. The infusion of technology into college courses has caused the FC Education Department to take a close look at what technology software and training is needed, in order to deliver relevant content in an appropriate and effective manner. The Franklin College Instructional Technology (IT) Staff have remained as consultants for the education professors. Also, internal technology grants have been written by the department over the last two years to purchase software and hardware to equip the education students with the methodology and tools associated with authentic teaching and learning.

Implementation Process

Building instructional technology into the curriculum was critical to the success of technology integration at Franklin College. Planning and implementation began in the fall semester of 2005. The faculty realized the need for infusing technology into existing courses and showed no resistance to implementing technology. But, reservations about their own technology skills, how to best implement technology components, and the amount of time taken from actual class lectures were all issues brought up by faculty. To deal with these reservations, faculty have had on-campus opportunities to become more familiar with software, have attended conferences on technology, and have experimented with integrating technology into existing curriculum through modeling and teaching. In developing appropriate benchmarks for preservice teacher training, several faculty members emphasized the importance of technology integration into course content, field experiences, as well as faculty training. The model in Appendix A illustrates the connections between faculty, students, and field experiences in promoting collaboration and technology integration where teaching and learning are apparent. According to Northup and Little (1996), "Faculty who integrate technology for teaching and learning will not only perform duties more efficiently but also will produce emerging classroom teaching models and strategies" (p. 219).

Prior to the infusion and integration of technology, a sophomore course/EDU 226-Educational Technology (2 credit hours), was taught by members of the Instructional Technology Department on campus in fifty minute sessions two days a week during the spring semester. As the FC technology trainers were assigned other obligations and concerns about the application of the EDU 226 concepts and skills, the FC education department decided to integrate technology into all education courses. Skills taught in EDU 226 were: Microsoft Word, Power Point, Excel, designing a Web Page, and beginning a Web-Quest. To infuse and integrate technology into every facet of the Education Department's curriculum, program-wide thinking was essential to create a feasible technology plan tailored to our faculties' and students' needs. Two members of the Education Department and a member of the Instructional Technology Team joined forces. We looked at what was being taught in the different courses, the INTASC and NETS•T standards, school corporations technology recommendations, as well as an effective technology plan for faculty and students.

In looking at skills needed for K-12 teachers and INTASC-NETS•T standards, a draft was designed and taken to the education faculty for feedback. Many long discussions were held and adjustments were made to make the plan more suitable for all faculty, course curricula, and students. Since the beginning stages of the technology plan design, several revisions have been made. Adjustments have not been made frivolously.

The decision was made from the onset of the technology integration that it would begin with the incoming freshmen and would continue to build during the students' next three years in the education program. The integration process began in the spring of 2006 with the incorporation of technology into EDU 124-Introduction to American Education taken by all freshmen interested in education as a major. In this course the students are exposed to various methods of research, how to find sources, using the library as a reference, creating a resource list of fifty links, and using a variety of technology components to create a digital storytelling product. During this course the students are exposed to the following technology tools and skills: how to use the library's online database, compiling a resource list using educational sites, using technology as a source for writing assigned papers, and using Movie Maker to create a digital storytelling product. The technology introduced and used in EDU 124, along with the skills obtained, become the foundation to build on in the next three to four years for a student at our institution. The current technology plan (Appendix B) further details what is introduced (*I*), developed (*D*), and mastered (*M*) for the sophomores, juniors, and seniors.

Conclusion

Since the implementation of our new technology plan, adjustments have been made yearly by revisiting what is taught in each course, the course objective(s), and how to better prepare teacher candidates in addressing teaching and learning. Our goal was and is to address the "wicked problem" Koehler and Mishra (2008) discuss in using new technologies in teaching and learning to prepare teacher candidates for teaching. This concept applies to stretching ourselves, the professors, to become proficient with the various components of technology in regards to teaching and learning, too. Teacher candidates need to be prepared to teach students using the most up-to-date software, hardware, and also have a familiarity to a variety of tools available to promote learning in the classroom. Rather than merely focusing on learning

technology skills, infusion of technology is supported with positive ramifications through the integration of technology into teacher education courses (Abdal-Haqq, 1995; Borko et al, 2009; Northup and Little 1996; Wentworth et al, 2004). Our higher education institution's technology plan has tried to addressed issues associated with research and feedback from schools and preservice teachers, in order to better prepare our teacher candidates for their field experiences, course curricula, and teaching upon graduation. As we continue to integrate technology, it is imperative that we make sure technology integration is done in depth, not just breadth. The value of using technology in teaching and learning should exemplify why a teacher does what they do and how to do it. Technology has become an integral part of our daily lives, because elementary, middle, and high schools nationwide are integrating technology into the classrooms at a record pace.

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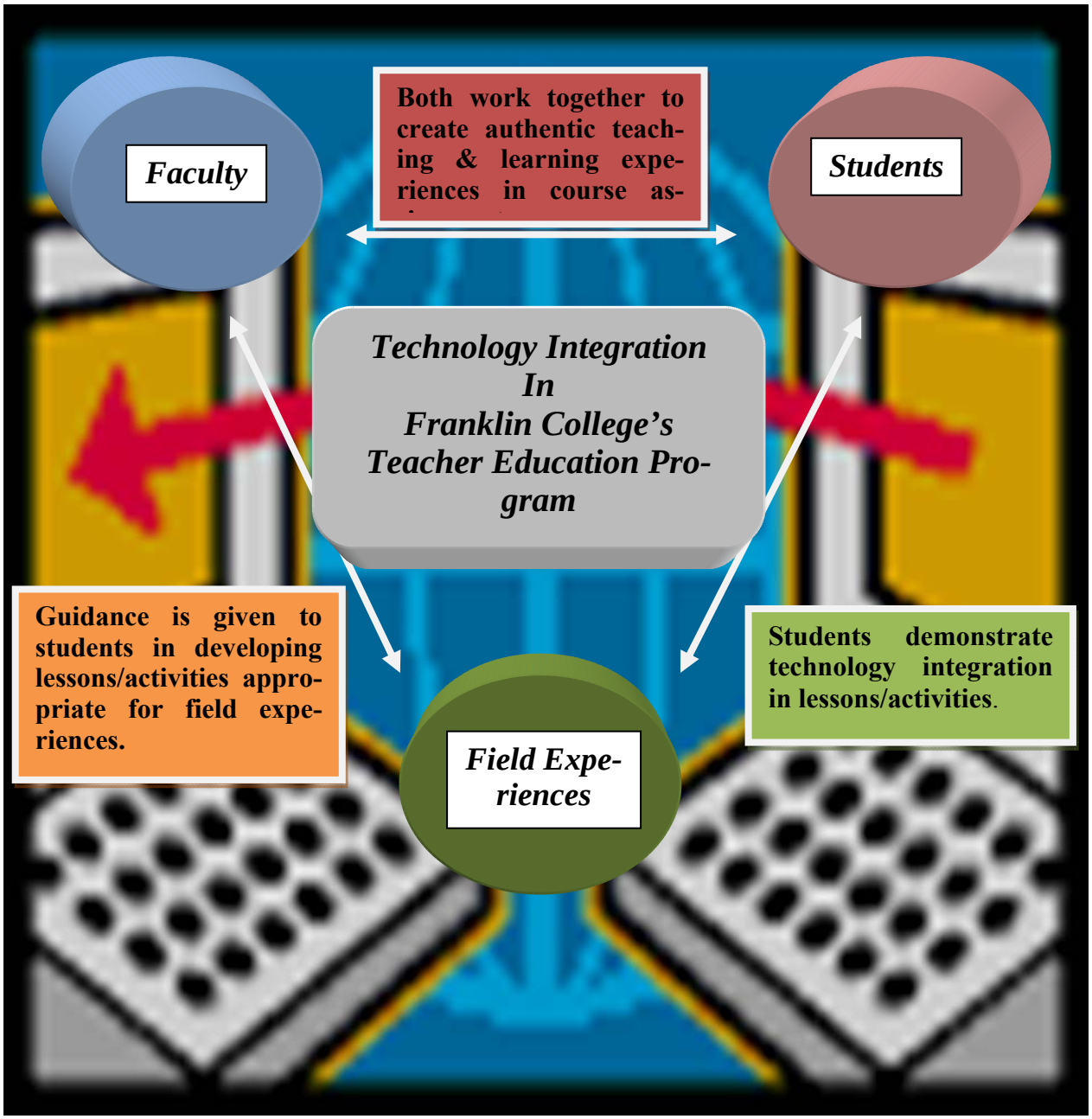
Appendixes

Appendix A:

Technology Integration between Faculty, Students, and Field Experiences



Appendix B: Technology Plan for Education Courses at Franklin College

Courses	***Technology Components: I-Introduced, D-Developed, M-Mastered***
Freshmen	
EDU 124 ***Introduction to Teaching and American Education***	▪ Resource File (Word)-***I*** ▪ File Management: Windows Explorer, Memory Sticks, Burning CDs-***I*** ▪ Library Skills: internet searches, databases, copyright info, plagiarism (Daria)-***I*** ▪ Digital Storytelling-***I***
Sophomore	
EDP 222 ***Survey of Exceptional Children/Inclusion***	▪ Adaptive Technology with Special Needs Children-***I*** ▪ Resource File-***D***
EDU 222 ***Child Development and Educational Psychology***	▪ Virtual Tours-***I*** ▪ Use of Digital Camera/Video-***I*** ▪ Scanner-***I/D*** ▪ Resource File-***D*** ▪ Digital Storytelling: Windows Movie Maker, Audacity, PhotoStory, Photoshop-***I/D***
EDU 225 ***General Methods for Effective Instruction***	▪ Gradebook-***I*** ▪ Laptop Computers-***I*** ▪ PDF (Acrobat)-***I*** ▪ Membership in List Serves, Blogs, Podcasts-***I/D/M*** ▪ Whiteboard Technology-***I*** ▪ Web Page Design-***I*** ▪ Document Reader-***I*** ▪ Resource File-***D***
Juniors	
EFE 300 ***Fall Field Experience***	▪ Résumé (Word)-***I/D/M***
EDS 326/327 ***Instructional Strategies I & II***	▪ Distance Learning/Angel–Blogs-***I*** ▪ WebQuest (Nvu)-***I*** ▪ Spreadsheet/Excel-***I*** ▪ Laptops-***D*** ▪ Whiteboard Technology-***D/M*** ▪ Resource File-***D*** ▪ Video Conferencing-***I/D/M***
SCI 334/335 ***Science & Elementary Teaching I & II***	▪ Distance Learning/Angel—Blogs-***I*** ▪ Graphing-***I*** ▪ Document Reader-***D/M*** ▪ Resource File-***D*** ▪ Laptops-***D*** ▪ Spreadsheet/Excel-***I***
EDE 344/345 ***Teaching and Learning Literacy I & II***	▪ WebQuest (Nvu)-***I*** ▪ Whiteboard Technology-***D/M*** ▪ Resource File-***D*** ▪ Laptops-***D***

EDE 365/366 ***Mathematics Methods for Elementary Teachers I & II***	▪ Graphing-***I*** ▪ Excel-***D*** ▪ Resource File-***D*** ▪ Laptops-***D*** ▪ Smart Airliner-I
Seniors	
EDU 415 ***Human Diversity in the Classroom***	▪ Resource File-D ▪ Digital Storytelling, Windows Movie Maker, Audacity, PhotoStory, Photoshop-D/M ▪ Use of Digital Camera/Video-M ▪ Scanner-M
FNA 420 ***Fine Arts for Elementary Teachers***	▪ Garage Band-I ▪ DVDs, Videos-I ▪ Midi Capabilities-I
EDS 422 ***Teaching Reading in Content Area***	▪ Evaluate & Explain WebQuest-D/M ▪ Distance Learning/Angel-M ▪ Resource File-D
EDE 443 ***Interdisciplinary Unit Planning***	▪ LCD Projector-I/D/M ▪ Laptop Computers-D/M ▪ Resource File-D/M ▪ Advanced Word Processing-M ▪ Evaluate WebQuest to match Unit-D/M
EDS 443 ***Interdisciplinary Unit Planning***	▪ LCD Projector-I/D/M ▪ Laptop Computers-D/M ▪ Resource File-D/M ▪ Advanced Word Processing-M ▪ Evaluate WebQuest to match Unit-D/M
EDE 444 ***Methods of Teaching Elementary Social Studies***	▪ Distance Learning/Angel-D/M ▪ Podcast-D/M ▪ Virtual Tours-D/M ▪ Digital/Video/360 camera-D/M ▪ Resource File-D
EDE/S 456 ***Professional Development and Performance Assessment***	▪ Résumés (Publisher)-I/D/M ▪ Brochures-I/D/M ▪ Update all areas of ePortfolio-D/M
EDE 457 ***Assessment and Evaluation Methods in Elementary Classrooms***	▪ Spreadsheet/Excel-D/M ▪ Gradebook-D/M
EDS 459 ***Methods of Teaching Middle and High School Content Area***	▪ Resource File-D ▪ Simulations-Science (only) I/D/M ▪ Document Reader-D/M ▪ Podcasts-D/M

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Identification, Causes, and Prevention of Identity Theft

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Abstract:

The ease of accessibility to personal information has become an increasingly worrisome concern in today's organizations and homes. Crimes of identity theft in which thieves use the victim's personal information to impersonate the victim have become all too prevalent. It is estimated that the number of identity theft victims annually is in the millions. Since identity theft can be a life-changing crime, this is a very serious matter. Although identity theft cannot be eliminated, it can be controlled, to an extent, by taking preventive measures. A great deal of the responsibility for prevention falls on the organization's information systems professionals. From an organizational perspective, precautions must be taken in dealing with the countless records that contain personal information. Of course, individuals must also take precautions to safeguard their confidential information. It is therefore important for information systems managers, general business managers, and individuals to understand information privacy and security along with relevant laws and government regulations. Since many of the theft controls and measures to combat identity theft are achieved through systems and technology, students in technology-related fields also need to be aware of both the technical and legal safeguards that are intended to protect the privacy and security of information. General and technical managers must stay apprised of current trends and practices regarding identity theft and know what to do in the event of an identity theft occurrence. This paper will discuss many of the technical, legal, and regulatory measures that are intended to help avoid identity theft.

Introduction

Identity theft has become a major problem in the United States and around the world; a problem that cannot be eliminated but one which can be better controlled by taking appropriate measures.
Simply defined, identity theft is a crime in which the thief uses the victim's personal identifying information such as a driver's license number or social security number to impersonate the victim (Pearlson, p.258). It is the unlawful use of another's identifying information for gain, and it has become the most prevalent financial crime in the United States (White, 2008).

Identity theft can be a life-altering experience. The U.S. Federal Trade Commission (FTC) estimates that consumers lose up to $50 billion annually to identity theft and recovery expenses. Victims are generally not held responsible for the fraudulent charges that result from identity theft, but the costs for the victim far exceed the monetary losses of the crime. Many experience a range of emotional states that mirror post-traumatic stress disorder, including denial, anger, guilt, shame and embarrassment, fear and a feeling of being violated (White, 2008). The Javelin

Strategy and Research Center has been studying identity theft since 2004, and their findings estimate that identity theft crimes affected almost 10 million victims in 2008, an increase of 22% over 2007 (Spendonlife.com, 2009). The FTC reported that its consumer fraud and identity theft complaints in 2007 showed a 21% increase over 2006. Unfortunately, many people do not realize that they have been victimized for months or even years. However, it is estimated that 71% of fraud occurs within a week of a victim's personal data being stolen (Spendonlife.com, 2009). In the meantime, thieves are accumulating debts, committing crimes, ruining credit records, etc. The FTC also estimated that U.S. businesses and financial institutions are losing about $53 billion annually as a result of identity theft (Swartz, 2009). The average cost for an organization per record compromised is about $197, typically for phone calls, free credit monitoring and discounts on membership fees and merchandise (Prosch, 2009).

Legislative Measures

The United States recognized identity theft as a crime in 1998 when the Identity Theft and Assumption Deterrence Act (ITADA) was passed. ITADA issued a general definition for identity theft as the knowing transfer, possession, or usage of any name or number that identifies another person, with the intent of committing or aiding or abetting a crime.

The ITADA definition takes into account three types of identity theft. In general terms, they include:

1. New account theft – Occurs when multiple pieces of information about someone is stolen, and the thief assumes the victim's identity;
2. Existing account theft – Occurs when something is stolen from some existing financial account;
3. Synthetic identity theft – Occurs when stolen information is combined with financial information to create a new fake identity (Schreft, 2007).

White (2008) also classifies three types of identity theft using definitions slightly different from the above, but nevertheless quite familiar. They include:

1. Financial identity theft – Occurs when the identity thief uses a victim's personal information to withdraw money or open a bank account or use a credit card or other type of credit in the victim's name;
2. Nonfinancial identity theft – Occurs when the thief uses the victim's information to obtain health benefits, commit fraud or receive a service;
3. Criminal record identity theft – Occurs when the thief commits crimes, traffic violations, or other illegal activities acting as the victim.

From the above classifications, one can readily see that there are a number of ways to classify identity theft and also understand the seriousness and the life-altering potential of becoming an identity theft victim. Statistics indicate that identity theft continues to be on the rise, and it is certainly a crime that must be taken seriously. Since it is the most prevalent financial crime in the U.S., it warrants the attention and precautionary actions of consumers, as well as business and government officials.

Another piece of legislation that addressed the need to protect information privacy was passed in 1999. The Gramm-Leach-Bliley Act of 1999 (also referred to as the Financial Services Modernization Act) requires financial institutions to ensure the security and confidentiality of personal information (names, addresses, social security numbers, credit card numbers, credit histories, etc.) and contains a fraudulent access to financial information section (FAFI), which directs financial institutions, such as banks and investment companies, to have "policies, procedures, and controls in place to prevent the unauthorized disclosure of customer financial information and deter fraudulent access to such information" (White, 2008).

Also somewhat related, is the Computer Fraud and Abuse Act of 2001. The act "describes various computer crime offenses that include intentionally accessing a computer without authorization or exceeding authorized access to obtain financial and credit card information" (White).

Several years later, in 2003, the Fair and Accurate Credit Transactions Act was passed and includes provisions such as the following to prevent identity theft (Haag, 2008).

- Consumer's have a right to get a free credit report once per year;
- Merchants are required to leave all but the last five digits of a credit card number off the receipt;
- Lenders and credit agencies are required to take action if there is a suspicion of identity theft.

Although identity theft was becoming prevalent in 2003, consumers rarely heard of these thefts. That changed after a landmark California law called the Security Breach Notice Law was passed in 2002. The law, which set off a series of nationwide events, went into effect in mid-2003, and it requires businesses or state agencies that experience a security breach to notify state residents if their personal information is lost or stolen (Greenberg, 2008). After ChoicePoint, a company that collects and compiles information about millions of consumers, inadvertently sold the personal information of 145,000 people to a Los Angeles con artist, lawmakers in other states moved quickly to ensure that their citizens would receive the same kind of notice as California residents. Nearly all states now have similar laws (Greenberg). Thus, once notices began to be sent on a widespread basis, identity theft became a part of the American culture and became a dreaded term in our vocabulary.

Many identity theft and fraud cases are prosecuted by the Department of Justice (DOJ), largely under the earlier mentioned Identity Theft and Assumption Deterrence Act (ITADA). Examples of federal offense felonies that carry substantial penalties include identification fraud, credit card fraud, and financial institution fraud. Some of the above offenses carry penalties as high as 30 years' imprisonment, fines, and criminal forfeiture. Federal prosecutors work with federal investigative agencies such as the Federal Bureau of Investigation, U.S. Secret Service and the U.S. Postal Service to prosecute identity theft and fraud cases (U.S. Department of Justice, 2009).

The information in the preceding paragraphs describes legislation that has been passed at the federal level. However, a great number of identity theft prosecutions occur at the state level, and state law then serves as the foundation. At least 48 states have identity theft laws, but there is significant variation in several important areas. State to State areas of variation on identity theft include the following:

- **Felony vs. misdemeanor** – Some consider identity theft a felony, some a misdemeanor, and some base it on the amount stolen.
- **Repeat offender** – Some prescribe harsher punishment for repeat offenders.
- **Victim assistance** – Some have provisions to ensure judicial relief to clear victims' names.
- **Venue** – Some prosecute regardless of jurisdiction, others only if the crime is within their jurisdiction.
- **Statute of limitations** – Most do not address when the statue of limitations begins.
- **Reverse criminal record identity theft –** Most fail to address this (using victim's good name to secure employment because of an existing criminal record) (White, 2008).

States' failure to model their identity theft legislation after ITADA has produced a great deal of inconsistency in state level occurrences, punishments and strategies to target identity theft occurrences (White).

Identity Theft Tactics

Identity theft can occur in a variety of ways, and for the most part, the general public is unsuspecting. We have come to think of identity theft as theft that involves sophisticated technology and highly trained criminals, but a great deal of identity theft occurs as a result of low-tech crimes such as check forgery, credit card misuse, employee negligence and the use of information carelessly thrown into the trash. A comprehensive list of the most common identity theft tactics has been compiled by Credit.com (2009):

The list includes the following:

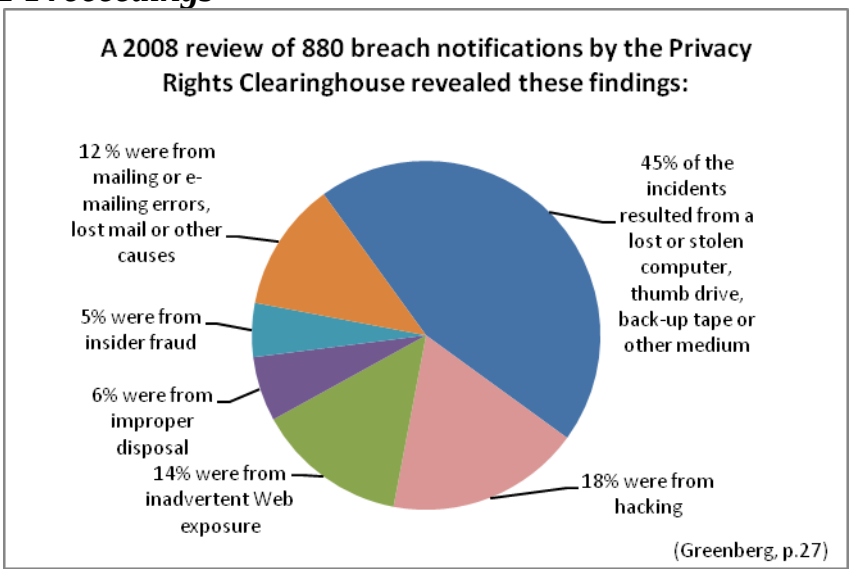
- **Check fraud** – Printing fake checks, stealing checks, ordering checks in someone's name or tampering with real checks.
- **Dumpster diving** – Stealing documents from a person's or business' trash can. Sensitive documents should be shredded.
- **Account redirection** – By filing a simple change of address form with the post office or by contacting your creditors, an identity thief can have an individual's personal mail sent to his or her own address.
- **Internal theft** – Employees of loan offices, credit agencies and companies that deal with sensitive data can steal records and use them for identity theft.
- **Purse/wallet snatching** – Theft of a wallet or purse.
- **Mail theft** – Steal mail from a person's mailbox in order to get credit card applications and other sensitive data.
- **Data theft** – Theft of consumer files from businesses, doctor's offices, universities, lenders, etc.
- **Child fraud** – Stealing the identity of a child and using his or her positive credit history to open accounts.

- **Computer spyware** – Spyware can be installed on an individual's computer without the individual knowing it. Every keystroke and word typed and website visited can be recorded and transmitted.
- **Social Security fraud** – Use of fake Social Security Numbers, including the numbers of people who have recently died.
- **Pretexting** – Thief contacts a financial institution posing as a customer and requests the customer's account information.
- **Insider Theft** – Employees or subcontractors can be the source. Up to 88% of insider theft may be inadvertent and the result of employee carelessness and negligence (Brandel, 2009).

Some of the more recent technology-related tactics used by identity thieves to steal consumer data and which are growing in popularity, include the following:

- **Phishing** – Emails are designed to look like an official message from a bank or financial website and requests an individual to update account information such as name, address, account number, PIN, and social security number. Can also occur over the phone.
- **Pharming** – Variation on phishing whereby thieves set up fake websites that look like official organization websites in order to "pharm" consumer data. Victim is directed to a fake site that looks real and asked to enter personal information.
- **Skimming** – Thieves use tiny hand-held credit card readers to collect information recorded on the magnetic strips of credit cards. Common in restaurants and stores where individuals submit a credit card to make payment.
- **Wireless hacking** – Thieves access personal data by tapping into these wireless connections. When a wireless network or Bluetooth system isn't secure and encrypted, individuals are susceptible (Credit.com, 2009).

As one can readily see from the chart that follows, statistics compiled by the Privacy Rights Clearinghouse reveal that although tactics varied widely, nearly 80% of the personal information breach notifications received in 2008 were technology-related. The Privacy Rights Clearinghouse further revealed that about 75% of the publicly known breaches reported involved social security numbers (Greenberg, 2008). Thus, it is extremely important for today's systems managers to have knowledge of common identity theft tactics and exercise extreme caution in systems design, operation and monitoring.



Governmental Preventive Measures

Throughout much of the world, governments have generally relied on two key means of identity protection. Cards or documents such as passports and driver's licenses and unique identifiers such as passwords or personally unique numbers such as social security numbers have been used for verification and authentication. Neither means is particularly effective. Cards and documents can be forged or counterfeited, and numbers are frequently lost or forgotten. Passwords as identifiers have become pervasive, and the cost of maintaining and controlling them has become exorbitant. Add to this the fact that not all authenticators who control these passwords are honest individuals, and unfortunately they have access to a host of confidential identity information (Chertoff, 2009).

Measures are being taken to make it much more difficult to counterfeit or forge cards or documents. Techniques such as chips in passports, the creation of secure pass cards, the use of bar codes, and embedded holograms in identification documents are enhancing the security of cards and documents. In the U.S., as a result of the REAL ID initiative, uniform standards are being established for all states to follow as they create driver's licenses and other state-related documents. Improved encryption techniques are also being used to safeguard numerical authenticators such as social security or PIN numbers (Chertoff, 2009).

The Federal Trade Commission (FTC) released recommendations to congress to help prevent identity theft through use of social security numbers on December 17, 2008. These recommendations followed a period of extensive research and included the following five points:

1. Develop a national standard to improve consumer authentication;
2. Restrict public display (posting) and transmission of social security numbers;

3. Establish national standards for data protection and customer notification regarding security breaches;
4. Increase education and outreach efforts to businesses and consumers on what can be done to reduce use and increase protection of social security numbers; and
5. Improve coordination and information sharing between private sector entities and government agencies to establish best practices (Adams, 2009).

The FTC also hopes to reduce losses attributed to identity theft with an update to the Fair and Accurate Transactions Act (FACTA) of 2003 with a program called the "Identity Theft Red Flag" program. Program enforcement will begin May 1, 2009. Fundamentally, to meet the new requirements, all organizations that handle consumer credit accounts must conduct an identity theft assessment and develop measures to identify, mitigate and prevent theft of consumer data (Swartz, 2009). Specifically, the requirements issued by the FTC apply to Section 114 of the FACTA Identity Theft Red Flags. There are 27 red flags that fall into the following five categories:

1. Alerts, notifications, or warnings from a consumer reporting agency;
2. Suspicious documents;
3. Suspicious personally identifying information;
4. Unusual use or activity relating to a covered account;
5. Notices from customers, identity theft victims, law enforcements officials, or other businesses about possible identity theft relating to covered accounts (Swartz 2009).

Stated simply, the red flag rules will force financial institutions to authenticate customers' identities and be more diligent in analyzing consumer transactions with the goal of being better able to protect sensitive customer information (Swartz).

Business Preventive Measures

Thus far this paper has presented some of the federal legislation that has been enacted to assist in our efforts to deter identity theft. Businesses also play a critical role in recognizing and deterring identity thieves. The American Institute of Certified Public Accountants (AICPA) has produced a comprehensive list of 10 suggestions for businesses to follow to avoid identity theft. The list of suggestions to safeguard personal information (PI) is as follows:

1. Do not collect more PI than you need
   - Document the types of PI you collect
   - Analyze PI being collected to determine if it is necessary to deliver your services
   - Document systems, business processes, and transactions that collect PI

2. Do not retain PI longer than legally required and/or necessary for business purposes
   - Determine legal requirements for record retention
   - Identify business purposes for retaining PI, and establish retention requirements
   - Document where PI is retained
   - Establish rules for purging PI

3. Protect PI you collect, use, disclose and retain
   - Establish administrative safeguards
   - Establish technical safeguards for logical access controls
   - Establish technical safeguards for identity management
   - Establish technical safeguards for network security
   - Establish technical safeguards and document policies for updating security patches and anti-virus software
   - Maintain security of physical mediums

4. Ensure additional protection methods on sensitive PI retained
   - Determine the type of sensitive PI to secure
   - Determine the required level of security
   - Identify where encryption solutions may be needed

5. Restrict access to PI only to individuals who have a business need to access information
   - Restrict Access to PI
   - Challenge the need to access PI for positions in an organization

6. Dispose of PI appropriately
   - Develop policies and procedures for disposal

7. Instill awareness and train employees on the proper handling of PI
   - Develop a privacy awareness program
   - Identify responsibility for providing training
   - Document training records

8. Understand federal, state and local laws
   - Know federal state and local laws and the rights consumers and employees have under those laws

9. Conduct regular audits to ensure PI is protected
   - Identify responsibility for monitoring the protection of PI

10. Keep abreast of the latest information on protecting PI
    - Generally Accepted Privacy Principles (GAPP)
    - Comparison of international privacy concepts (AICPA, 2008)

Businesses also need to be aware of the Data Life Cycle Management (DLCM) process; that is the flow of data from its creation to the point when it has lost its business value to the organization (but not necessarily its value to data thieves). Attentiveness to this cycle can help avoid thefts and unwanted exposure of information. The DLCM consists of the following five phases:

1. Data Collection and Transmission – Focus on the security and necessity of collecting PI;
2. Data Storage – Focus on unauthorized access by both internal and external sources;
3. Data Processing and Use – Focus on safeguards against information being erroneously processed and accidentally exposed;
4. Data Sharing and Replication – Focus on development and enforcement of policies and have appropriate training in place and
5. Data Destruction – Focus on appropriate destruction of paper-based and electronic PI (Prosch, 2009).

If an organization experiences a PI breach, it must be prepared to take action immediately. That means an Incident Response Plan and Team must be in place. This team is responsible for putting the plan into action very quickly and therefore must be well-trained. When a PI breach has been confirmed, the affected individuals must be notified as quickly as possible. The steps should be as follows:

1. Notify the Incident Response Team;
2. Coordinate timing, content, and notification method with chief privacy officer and legal counsel;
3. If desired, prepare and issue a press release (press will find out);
4. Be proactive in notifying the affected individuals and the public (Prosch, 2009).

Failure to act swiftly and properly can result in sanctions by the FTC. If a company is sanctioned, it will incur the added cost of required security audits every two years for the next 10 to 20 years (Greenberg, 2008).

In addition to commonly used defenses such as spyware detection software, encryption methodologies and effective firewalls, businesses need to take special precautions to protect the personal information stored in their vast array of databases. As referenced above, many organizations have hired a Chief Privacy Office to provide oversight in the increasingly important area. Organizations are also enhancing training and awareness programs in an effort to prevent internal theft and employee negligence incidents.

Individual Preventive Measures

As stated previously, if one becomes a victim of identity theft, the experience can prove to be life-altering. Correcting damage done by criminals against an individual's name, reputation, personal or financial status, etc. can be a very daunting task. Some basic steps for minimizing identity theft or fraud can be summarized by remembering the word **"SCAM"** (U.S. Department of Justice, 2009).

S Be **stingy** about giving out your personal information to others unless you have a reason to trust them, regardless of where you are:
- Adopt a "need to know" approach to your personal data.

- If someone you don't know calls you on the telephone and offers something of value, but asks you for personal data, ask them to send you a written application form.
  - If they won't do it, tell them you're not interested and hang up.
  - If they will, review the application carefully when you receive it. The Better Business Bureau can give you information about businesses that have been the subject of complaints.
- If you're traveling, have your mail held at the post office.
- If you have to telephone someone while you're traveling and need to convey personal financial information, do it privately.

C **Check** your financial information regularly, and look for what should be there and what should not be there.

- What should be there – monthly bank and credit card statements.
  - If you're not receiving monthly statements, call the financial institution immediately.
  - If your statements are being mailed to another address that you haven't authorized, tell the financial institution or credit card representative immediately that you did not authorize the change of address.
- What shouldn't be there – checking your monthly statements carefully maybe the quickest way to find out if someone has gotten your financial data.
  - If someone has managed to get access to your mail and other personal data, and opened any credit cards in your name or taken any funds from your bank account, contact your financial institution or credit card company immediately.

A **Ask** periodically for a copy of your credit report.

- Your credit report should list all bank and financial accounts under your name, and it will provide other indications of whether someone has wrongfully opened or used any accounts in your name.

M **Maintain** careful records of your banking and financial accounts

- Retain your monthly statement and checks for at least one year.

If you actually have the unfortunate experience of becoming a victim of identity theft, the U.S. Department of Justice (2009) suggests the following actions:

- Contact the Federal Trade Commission (FTC) by telephone toll-free at 1-877-ID THEFT (877-438-4338) to report the situation

Under the Identity Theft and Assumption Deterrence Act (ITADA), the Federal Trade Commission (FTC) is responsible for receiving and processing complaints from people who believe they may be victims of identity theft, providing informational materials to those people, and referring those complaints to appropriate entities, including the major credit reporting agencies and law enforcement.

You may also need to contact other agencies for other types of identity theft:

- Your local office of the Postal Inspection Service
- The Social Security Administration
- Internal Revenue Service (call 1-800-829-0433)

Also, call the fraud units of the three principal credit reporting companies:

1. Equifax – call (800)525-6285
2. Experian – call (888) EXPERIAN or (888)397-3742
3. Trans Union – call (800)680-7289

Contact all creditors with whom your name or identifying data have been fraudulently used.

Contact all financial institutions where you have accounts that an identity thief has taken over or that have been created in your name but without your knowledge.

Contact the major check verification companies if you have had checks stolen or bank accounts set up by an identity thief. If you know that a particular merchant has received a check stolen from you, contact the verification company that the merchant uses:

1. CheckRite – 800-766-2748
2. ChexSystems – 800-428-9623 (closed checking accounts)
3. CrossCheck – 800-552-1900
4. Equifax – 800-437-5120
5. National Processing Co. (NPC) – 800-526-5380
6. SCAN –800-262-7771
7. TeleCheck – 800-710-9898

Conclusion

Identity theft is a crime that is growing rapidly and one which costs the U.S. economy billions of dollars per year. Unfortunately, data breaches have become a way of life for corporate America (Brandel, 2009). Thieves are continually developing more sophisticated schemes, and forcing our government, businesses and individuals to enhance their awareness and protection practices against this devastating crime.

Old fashioned thievery tactics have given way to more sophisticated, technology-based schemes for theft of personal data. The end result is that personal information is stolen in large volumes and thousands of people can be affected. The magnitude of crimes involving identity theft is such that our government, through legislation, our businesses, through improved processes, and individuals, through enhanced knowledge and understanding, must all do their part to curtail the increasing number of incidents. From a governmental perspective, the Department of Justice, and from an organizational perspective, the American Institute of Certified Public Accountants have produced valuable guidelines to both prevent

and deal with identity theft. As a result of legislation, when personal information breaches do occur, organizations are faced with the daunting task of notifying potential victims as soon as possible. Of course, for an organization to be prepared to deal with a breach of personal information, planning is important. If organizations adopt a mix of computer technology, internal controls, contractual agreements, and assigned responsibilities, they can help prevent identity theft, take prompt corrective action and minimize their liability (Petravick, 2009).

From a need to know perspective, it is important for individuals to understand how identity theft occurs and possess knowledge of what one should do if victimized by this extremely intrusive crime. As educators prepare students to assume positions in organizational environments, they must incorporate "real world" issues into their educational offerings. It is not enough for prospective computer and systems professionals to be proficient in technical issues such as programming and analysis. They must possess a sense of awareness of issues that they will face on a day-to-day basis as professionals. Frequently, these issues are not evident in the textbook being used for a course. It is therefore imperative that the coverage of matters such as identity theft (and how to deal with it) be introduced as part of the knowledge base of the instructor. Typically, this means extending instruction beyond the boundaries established by a typical programming or systems textbook. It is important, therefore, for the instructor to be knowledgeable of these issues and their associated implications and legalities.

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2009 ASCUE Proceedings

What Does A Google Search Really Cost?

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Abstract

An article posted in TimesOnLine early in January claimed that two Google searches generated about the same amount of carbon dioxide as boiling water for a cup of tea. Google was quick to respond and to disagree. What are the real costs of such a search? Should the IT department at a college campus even worry about this? This paper will explore some of the issues which should be considered.

The Debate

On January 11, 2009 the Sunday Times of London published an article claiming that two Google searches performed on a desktop computer generate as much carbon dioxide as boiling water for a cup of tea. [7] The article cited the research of Alex Wissner-Gross, who is an Environmental Fellow at Harvard with special interests in green computing, energy and computation. Wissner-Gross, together with Tim Sullivan, developed a Web site, CO2stats.com, designed to educate people about energy efficiencies. They hope to leverage the growing energy consumption of the internet to the increasing demand for renewable energy. Although the Times article linked its claim about the environmental cost of a Google search to Wissner-Gross's research, in fact his research never mentions Google and focuses instead on the Web overall. He found that it takes on average about 20 milligrams of CO2 per second to visit a Web site. [9] Google was quick to dispute the Times' claim as well. In fact the founders of Google, Larry Page and Sergey Brin, are really dedicated to green initiatives. Google claims that an average query uses .0003kwh. In terms of greenhouse gases, this is equivalent to about 20 milligrams of CO2 (in contrast to the 7grams that would be equivalent to the cup of tea example).The Times issued a clarification on January 16 and accepted the 20 milligram figure for a one-hit search taking less than a second.

The Real Issues

The important question is not really the energy used for a single "average" search, but rather the environmental consequences of the internet as a whole. A recent report by the American research firm Gartner suggests that the global IT industry causes 2% of global emissions, exceeding that produced by the world's airlines. Estimates of the number of internet searches done daily across the globe range from 200 million to a billion. The one billion estimate comes from Google, which estimates the environmental cost as equivalent to driving a car 1,000,000 km. What is needed for a single search? If you wish to perform a search, you first need to type in the search, assuming that your computer is already turned on. Hence there is an energy cost for the personal computer being used. There is also the energy needed for the network. The search request then probably goes to multiple servers in multiple data centers. Each server must be prepared to receive your request, so there is work to be performed before the search

starts, work such as building a search index. In addition to the power used for each server, there is the overhead power needed to run the data centers. All of this has to be factored into any calculation on the total amount of power used for a search. Of course, searches vary widely in their complexity, with some needed far more time than others. Google's estimate of 20 milligrams of CO2 for an average search only takes its part of the equation into account. The company in fact works hard to guarantee that its searches are efficient.

Among the company goals are goals to minimize the electricity used by its servers and reduce the energy used by the data center facilities themselves [3]. Of course, as Nicholas Carr (author of the Atlantic Monthly article 'Is Google Making Us Stupid") pointed out, Google has a bit of a problem. The company is definitely dedicated to energy efficiency but also to getting people to spend as much time on the internet and their computers as possible. After all, Google works on an ad-based business model. [2]

The Nature of a Search

Consider what happens when you need a particular piece of information. Before the age of computers this would have involved a phone call or a visit to the reference desk of a library. Now that computers can store vast amounts of information we expect to get online and find what we need. Google's mission is to organize the world's information and make it universally accessible and useful. A typical search request does not go just to one data center, but to several. Google does not make public the number and locations of its data centers, considering this to be proprietary information. The company does claim that the first hit is generally found quickly, but note that speed is accomplished by using multiple servers rather than just one for a single search. However some searches are inherently more complicated than others. Also, the Web was not set up with efficiently searching as the goal. It is almost fair to say that we set up the haystack first and now we want to search it. Many publishers have multiple URLs that all point to the same page, causing search engines to index the page multiple times. A good search engine will have some way to detect duplicates. In fact, Google and its rivals Yahoo and Microsoft have agreed to support a new standard (the Canoncial Link Tag) that would allow publishers to get rid of the duplicate pages. Adherence to such a standard would allow both more efficient and more comprehensive searches. [5]

We, of course, don't always go to Google. There are plenty of sites dedicated to particular needs that also run search engines, searching databases that store focused information such as flight schedules, store catalogs or financial information. A company like Google does collect an enormous number of addresses of Web pages (adding its one trillionth address a year ago) , but the search strategies used work best for the surface Web (gathering information by following the trails of hyperlinks) as opposed to searching dedicated databases (with something called a Deep Web search strategy). Google is indeed exploring Deep Web search strategies, using a strategy that involves sending out a program to analyze the contents of any database it encounters. Others are also involved in developing these newer search strategies, which pose thorny computational challenges. As search engines being to incorporate Deep Web content into the search results, there is another problem. How does one present different kinds of data without making the search pages impossibly complicated? [10]

There are multiple ways in which to reduce the environmental impact of a Google (or Yahoo or Microsoft) search. Although clearly efficient search algorithms are important, one also has to consider the resources used to run the data centers. The EPA, in an August, 2007 report, estimated that energy consumption at servers and data centers has doubled in the past five years and will almost double in the next five years. It has been developing Energy Star standards for servers, focusing first on the efficiency of the servers' power supply and its energy consumption while idle. [6] A growing trend is to use virtualization to improve data center efficiency. Data centers often have underutilized servers. Consolidation using virtualization increases server efficiency and lowers energy consumption. [4] Hewlett-Packard has been able to consolidate 86 data centers into three, with three backups by using virtualization. [1] Google claims that the data centers it has designed use considerably less energy than a typical data enter. Given that the company runs multiple data centers, this clearly is in their best interest. Google uses customized evaporative cooling in its data centers. Two of their facilities currently run on 100% recycled water, and by 2010 the company expects recycled water to provide 80% of the total water consumption at their data centers. The company claims that among its goals are goals to minimize the electricity used by its servers and to reduce the energy used by the data center facilities themselves. [3] Microsoft has built data centers in central Washington powered by hydroelectricity, power produced by the two dams in the region. Another Microsoft data center in Dublin, Ireland (expected to be operational this year) will be air cooled, due to the moderate climate in Ireland. Yahoo's data centers are carbon neutral due in part to carbon offsets. [6] Yahoo also took advantage of the Pacific northwest climate to build a new data center in Quincy, Washington knowing that it would use less air conditioning.

We also must consider what happens at the beginning end of a search. Clearly someone has to be using a computer, which may or may not be turned on when the information for which we are searching is needed. Once the computer is powered, we need to start with some kind of interface. Google's screen typically has a white background. A number of groups have worked to make the interface more environmentally friendly. For example, Greenlinking.com offers a wrapper that let's you use Google alone or Yahoo, ninemsn and Google combined. The site purchases carbon credits via Carbon Planet Offset of 20kg. of greenhouse gases per user per month. Ecocho offers a wrapper over a Google search which gives the users the opportunity to purchase carbon offsets by performing searches. Their estimate is that they grow 2 trees for every 1000 searches. Another approach is to make the wrapper itself more environmentally friendly. Both Blackle and Eco-Find offer black backgrounds for Google searches. The savings are achieved if the user has a CRT monitor, but there is probably not a significant savings for an LCD screen. [8]

Conclusions

If Google, Yahoo and Microsoft all wanted to make reducing energy consumption their number one goal, they could encourage us to reduce our time on line. Perhaps they could even give us a tool on the toolbar that would keep track of the grams of CO2 we emit as we are on line, as Nicolas Carr suggested (somewhat facetiously). Of course, this isn't likely to happen. These companies are in business to make money, and the business requires that we be on line. It is a good thing that all three companies are working on controlling the environmental impact of the business at their end. That leaves the consumers to consider their end of the equation. Just maybe not all those hours of recreational searching are that

critical. Certainly we can be sure that our computers are appropriately controlled when not in use, and turned off at the end of the day. The idea of that tool on the toolbar is a bit frightening for what it might reveal. Perhaps we are not that far away from such a tool. Wissner-Gross's company, CO2stats, has developed a software suite that monitors a web site's energy usage, supplies hints on how to make the site more energy efficient and purchases renewable energy from wind and solar farms. A student, when told about the topic of this paper, asked "Just how guilty do I have to be?" The correct answer lies not with guilt but with awareness. If all of us paid more attention to the environmental consequences of our searches, not just leaving the concerns to the Googles of the world, we could make a significant difference.

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2009 ASCUE Proceedings

Data Security is About People, Not Technology

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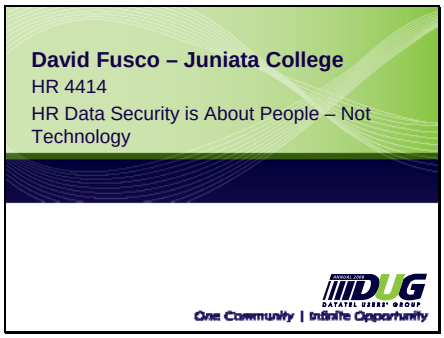
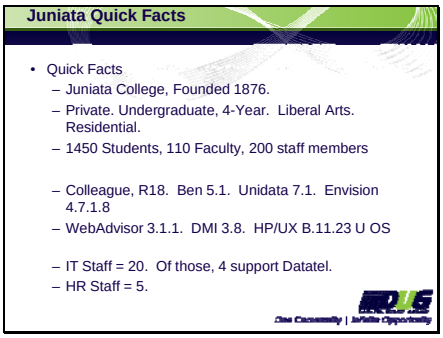
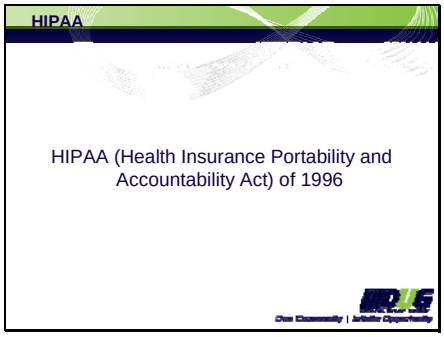
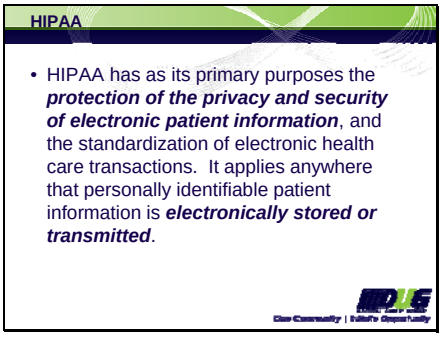
Abstract

I will discuss the differences between several security topics, such as CALEA, HIPAA, and the Higher Education Opportunity Act updates of 2008 and what Juniata is doing to attempt compliance. I am including my slides in the proceedings.









HIPAA

- University hospitals and clinics are covered by HIPAA, student health centers are not (by default), and ***colleges are covered*** if employees can file insurance claims through the personnel office.
- General guideline, the institution both:
  - Provides health care services AND
  - Engages in one or more of the covered electronic transactions…

HIPAA

- Electronic transactions…

Health Care Claims	Health Care Payment Data
Benefits Coordination	Health Care Claim Status
(De-)Enrollment Data	Health Plan Eligibility Data
Health Plan Premium Payments	Referral Certification and Authority
First Report of Injury	Health Claims Attachments

HIPAA

- HIPAA and FERPA overlap in several areas, but ***HIPAA requires an opt in for sharing patient information, whereas FERPA requires an opt out by the student***. Without authorization by the patient, personally identifiable health information may only be used or disclosed for treatment, payment or operations.
- FERPA trumps HIPAA

HIPAA

- Of the four parts of the HIPAA legislation, two apply directly to colleges like Juniata that don't have hospitals or clinics.
  - Basic Privacy Rules
  - Security Requirements

HIPAA – Basic Privacy Rules

- **Basic Privacy Rules** (taken from Datatel Data Privacy and Security Webinar).
- The institution must:
  - Distribute notices of patient rights
  - Designate a privacy officer and a contact person
  - Develop procedures for assuring privacy
  - Identify and train employees who may have access to patient records

HIPAA – Basic Privacy Rules (cont.)

- The institution must (continued):
  - Establish a complaint procedure and authorize appropriate sanctions
  - Implement technical and physical safeguards for patient information
  - Set document retention procedures and audits
  - Track permitted disclosures of information and report unauthorized disclosures
  - Review and amend contracts with third party associates

HIPAA - Basic Privacy Rules (cont.)

- Third party associates must agree to follow similar rules for protection of patient information.
- Patients have the right to:
  - Review their information and request changes or corrections
  - Request accounting of disclosures
  - Designate persons who may or may not receive information
  - Request restrictions in the use of information
  - Withdraw authorizations

HIPAA – Security Requirements

- Security measures may be used that ensure the ***confidentiality of electronically protected health information and protect against reasonably anticipated threats***. Best practices concerning physical and electronic protection of servers, encryption of data, secured backups and restricted access privileges should be implemented.

Juniata College

What Juniata is Doing…

Employee Measures

New Employee Training / Specialized Training

- Emphasize awareness
  - – Don't leave sensitive material out
  - – Don't copy sensitive material onto your laptop or jump drive
  - – Don't share data via email – why?
  - – …

Employee Measures

New Employee Training / Specialized Training

- Emphasize awareness
  - – …
  - – Don't write your password on a post-it note
  - – Change your password often (required once / year)
    - Use of Password Safe
    - Single Sign on, but re-enter for UI / WebAdvisor access

HR Measures

- Separate offices for Benefits Coordinator, HR Director, Payroll Supervisor
- Separate Fax line (private)
- Locked file cabinets; locked building, offices
- Remove participants SSN #'s from Health Plan ID cards by giving unique Medical ID numbers

HR Measures

- Allow employees (and students) to 'hide' certain demographic information from our intranet
- Shred as much as we can
  - – Shred-it contract
- Student workers cannot access employee information

Datatel Measures

- Sensitive files protected
  - – Query Builder and Colon Prompt verbs
- Users are encouraged to lock workstations
  - – Future initiatives to help
- No credit card data stored on servers
  - – Not even encrypted (Datatel e-commerce)
- SSN not stored outside of Datatel server
  - – PowerFaids is the exception

Datatel Measures

- Hold file – change of access, permissions
  - – Samba, UNIX permissions (Group, User)
- 'Legalize language' at both Network and UI signin
- Strategy – department's own and grant access to 'their' data by way of email authorization
- WebUI access – given on a case by case request
- Log analysis – poor man's IDS

Network Measures

- Network registration – both wired and wireless
- IP-based UI access
- VPN for wireless (double VPN) and home access – Encrypted traffic – why???
- Firewall / IDS usage
- Anti-virus – inside and out (SMTP)
- Web Access – all SSL based
  - – Portal integration with data
  - – Authentication matches with AD access

Physical Security

- New fire suppression system
- Video cameras
- Electronic door access; limited door access
- Automatic alarm system
- New HVAC
- Visitor logging / access (vendors)
- Generator usage for downtime
  - Centralized UPS
- Distributed backup hardware

Future Initiatives

- Continued work with Emergency Notification
- Self-services password management
- Security Tokens - maybe…
  - What is two factor authentication anyhow?
- SSH UI
- Security / Policy sign-off
- …

Future Initiatives

- …
- Encrypted hard drives
  - Juniata's Mobile Initiative
- Employee appreciation for data sensitivity, starting at the top and throughout – 'CTS Stickers'
  - Unlocked workstations – yikes!
- Business Continuity / DR Planning
  - Continues forever
- Training, training, and more training

Audience Discussion

What are you all doing?

Contact Information

QUESTIONS???

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Making the Most of your Technology & Vendor Contracts

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Abstract

Even with a shrinking economy institutions still hold dozens of contracts with technology vendors, maintenance agreements, leasing and licensing arrangements. Very few faculty or administrators are schooled in the art of contract negotiation, and in truth most have never actually read the contracts. Learn the basics of contract negotiation, learn what is in play and what is not, protect your institution, understand remediation procedures and most importantly learn how to reduce the cost of the agreement.

Note: The author was not able to submit this paper before the Proceedings went to print. He will supply copies or a link to a website where copies may be obtained at his session,

2009 ASCUE Proceedings

Licenses and Agreements: Responding to Potential Pitfalls

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Introduction

One upon a time there were three bears: vendor bear, developer bear and third-party bear. Vendor bear sold developer bear software which he used to create a porridge recipe application. Third-party bear used developer bear's application to make a big batch of porridge to sell at his Porridge Emporium, but alas the porridge was too hot, destroying his customer base and eventually forcing third-party bear to sell remaining assets at rock bottom prices. Whom does third-party bear sue? Who pays the blonde-headed defense attorney? Unfortunately, as in the fairy-tale world, the answers are not obvious in academia.

Use of software is fundamental to any computer-related field of study. Whether in the form of word processors and other productivity tools, software development platforms and compilers, operating systems and systems utilities, or other applications, academic institutions install numerous software packages and are subject to the related licenses. Some software is licensed to support administrative tasks while others are licensed for academic use. Fortunately, many vendors differentiate between academic and administrative use and thus price accordingly. Academic pricing programs vary from no cost to a discounted price structure, or some combination of the two.

As it is for most organizations, license management, that is, obtaining the appropriate type and adequate number of licenses in the most economical manner, is challenging for academic institutions, but the variety of titles and types of licenses complicates the task for schools. Also, the pervasive attitude toward academic freedom and individual exploration motivates academicians to deploy software as needed. Trial licenses, freeware, shareware and open-source software are easily obtained and, unless tightly controlled, can be installed on institutional hardware.

While the primary focus of license management is matching licenses held with installed seats, embedded within these licenses are commitments accepted by the institution as the software is obtained or deployed. Many clauses in the endless legal morass of a license appear to be irrelevant to academic deployment, yet indeed the clauses are included for a specific reason, to protect the interests and identify the contractual obligations of the parties. This paper will explore the purpose of the software license and some of these clauses included therein, specifically indemnity and jurisdiction, as it relates to academic users. In addition, the issue of signature authority will also be examined.

Licensing

Software exists as intellectual property and thus the rights can be assigned or licensed. Assigning gives all rights to another party while licensing gives the licensor the ability to grant specific rights (Classen 2007). Although the phrase "buying software" is not uncommon, in most cases such a transaction does not result in acquiring the product. If sold as a good, the purchaser can duplicate and redistribute the product. Thus, software is "purchased" through a license to use agreement. The producer can then extend control over product distribution through copyright protection and preserve a source of income.

The license is a contract between the software provider, or licensor, and the purchaser, or licensee. It delineates the rights and obligations of each party which are negotiated by the parties involved, each of which, depending upon the amount of leverage in the relationship, seeks to buttress its own interests. Allowed actions, limitations, remedies and responses to breaches of the license or applicable law are identified.

Proprietary licenses tend to be very specific in restricting use, copying and conveying the license to others. In contrast, open-source or "copyleft" licenses promote redistribution of the software itself while maintaining control over the use of the software. Free software licensing conveys virtually all rights to the licensee including the ability for the licensee to incorporate the free software into its own proprietary offerings.

Pertinent Statutes

All contracts have a foundation in the law, but the contract's purpose is to modify and extend the law to the contractual relationship. The underlying law in essence is the default agreement from which the license may deviate. For software, the underlying state laws are based upon the Uniform Commercial Code-Sales, or UCC Article 2, which addresses sales of goods (Cornell University Law School). It predates software distribution but nonetheless has become foundational to judicial regard for software licensing addressing relevant issues such as "contract formation, interpretation, performance, warranties, and remedies" (Landy 2008, 194). State laws also provide protection for trade secrets and are based upon the Uniform Trade Secret Act (UTSA).

The Uniform Computer Information Transactions Act (UCITA), proposed in 1999, specifically addresses software and digital products. It has been heavily criticized as favoring large software vendors over consumers, and it has not been widely embraced by state legislatures (AFFECT; Landy 2007).

Licensing Intellectual Property Rights

Licensing limits the licensee's use of the software under intellectual property rights. The licensor's rights will be considered violated if the licensee exceeds the limitations in which case the license will specify the remedy to follow, but this also implies that the licensor holds rights it can grant (Classen 2008). Thus, the license serves as a demarcation between appropriate and inappropriate use of the software. A well-structured license will protect the interests of both parties and gives each the freedom to exercise within the specified bounds.

Intellectual property rights take the form of trademarks, copyrights, patents and trade secrets. Each of

these forms protects a different aspect of the software product and can be applied "because software can be both a work of authorship as well as a business process" (Classen 2007, 11). Software exists as source code that can be printed or displayed, or as executable modules containing procedures and algorithms. It can also enforce adoption of specific procedures, e.g., ERP systems. Multiple protections are necessary for the diverse aspects of intellectual property, that is, no single protection is applicable to all aspects of the intellectual property.

Trademarks

Trademarks protect branding property such as product names and slogans. (Gordon 2006). Some licensors create logos specifically for academic institutions and related trademark clauses may be applicable to the school's use of logos in its own advertising. Aside from branding of the software, trademarks are not an important intellectual property issue.

Copyrights

Copyright protects the expression of the software, in a printed or digital form, but it does not address the underlying concepts within the programs. It protects code when printed on a page, but not the processes or procedures represented by the code (Classen 2008). As an expression in a digital form, licensed, proprietary software can be used, but not duplicated and redistributed.

One caveat for copyrighted material is that it must be available to the public so other parties can avoid infringement. Applied to embedded processes, this would require the vendor to publish the source code or to allow reverse engineering (Gordon 2006). Thus, copyright protection, while useful in limiting duplication of the digital expression, is not an attractive licensing option for protecting the underlying processes.

Patents

Conversely, a patent applies to processes, equipment and physical compositions as well as related extensions and improvements (Classen 2008). Thus, it protects the underlying concepts but not the expression thereof. Also unlike copyrights, one must apply for a patent and ensure that the concept is adequately different from all other patented processes. Patents restrict others from using the processes for twenty years following the first application filing. Like the copyright a patent requires the holder to reveal the protected process so that other parties can avoid infringement.

Trade Secrets

Trade secrets, like patents, offer protection to underlying processes, but trade secrets do not require an application review and are not limited to twenty years. Protection offered is also broader than that of patent as it extends to "computer code . . . program architecture . . . information content including order, structure and sequence [and] algorithms" (Classen 2007, 13). Trade secrets are at risk in that the intellectual property can be discovered or obtained through reverse engineering and the property right disappear (Amjad 2002). Violation of trade secrets is the easiest infringement of intellectual property rights as the protected concept is not visible (Classen 2007).

Presentation of the License

Software licenses are as ubiquitous as software. The shrink-wrap license, where the licensee indicates acceptance of a printed agreement by opening product packaging, is common for off-the-shelf titles. Licenses for software that is downloaded are often presented prior to downloading, requiring the licensee to click an acceptance button to initiate downloading files. In both cases, required acceptance is often reiterated during software installation through so-called "clickwrap" or "clickthrough" action. A product's paper license and clickwrap license may be inconsistent so one should carefully examine both. Membership agreements such as those for Microsoft® MSDN® Academic Alliance, Oracle® Academy, IBM® Academic Initiative and Altova® Education Partnership may place additional restrictions on software use.

Licenses may not be printable nor available for review after installation making later review most difficult. An inconvenient review during the installation process may prompt the licensee to forego a careful reading, but this neglect can lead to unintended obligations.

Goals of Licensing

Like any contract negotiation, parties entering into a license agreement wish to protect their interests. The licensee wants assurance the software meets its needs and that the product does not violate any third-party intellectual property rights prompting consequences for the licensee. Unfortunately, unlike customized software, shrink-wrapped and click-wrapped licenses are not submitted for negotiation. The licensee is given the option to accept the license or forgo use of the software.

Obviously the licensor wishes to protect its own interest. "The approach used in most vendor form agreements is to warrant title, provide a narrow indemnity for intellectual property infringement, and limit their liability to, at best, a fraction of the fees paid under the agreement" (Overly and Kalyvas 2004, 51). While these terms may appear fair, they, at a minimum, create disadvantages for the licensee and can be used to unfairly distribute risk to the licensee. Generally, license terms are binding, even if later considered onerous; thus, the licensee should consider the entire license, especially indemnity and jurisdiction clauses, that can be quite problematic.

Warranties and Indemnity

Warranty is a separate but related concept to indemnity. Warranty clauses appear as statements that the software product meets certain criteria while the indemnity describes the remedy for specific breaches. Both seemingly offer guarantees about the product, but Tollen (2006) suggests

that warranty and indemnity is not about guarantees but about allocating risk between parties; thus, the licensee must recognize risks to which it is obligated and risks the licensor is unwilling to accept.

Warranty

Warranties basically state that a representation is true. They may be explicitly stated (express) or be ap-

plied by default (implied). Implied warranties of the UCC include merchantability, addressing quality and performance; fitness, addressing appropriateness of use; title, addressing rights to sell to the customer; and non-infringement, addressing intellectual property rights (Landy 2008). The licensor may deny implied warranties, but such a statement must be conspicuous in the license. Usually such a clause is printed in bold, upper-case letters.

Merchantability and fitness are two problematic issues for licensors. The inherent complexity of many software applications opens merchantability to various interpretations. Likewise, the fitness of the software for a particular use is assessed by the licensee; thus, licensors often include specific language to exclude implied warranties (Tollen 2006).

Other warranties may ensure that the software complies with applicable law, the licensor faces no pending litigation related to the product, that any third-party software incorporated into the product is identified, and that the licensor has the right to extend a license that includes such third-party programs (Overly and Kalyvas 2004). Warranties may guarantee the product does not contain viruses nor any disabling mechanisms. Additionally, the license may warranty that dates are processed correctly (Gordon 2006).

Indemnity

In a license between two parties, indemnity's frequent purpose is to protect one party from negligence of the second party that results in claims brought by a third party. It is often used to limit liability when intellectual property rights are violated, but it can include other types of damage as well (Classen 2007). It can be specifically limited by the type of intellectual property, be it copyright, trade secret or patent, geographic region, date or the vendor's knowledge (Landy 2008).

Indemnity can extend from the licensee to the licensor or from the licensor to the licensee. For instance, if a software development firm incorporates another vendor's application into its own product and a competitor of the vendor claims infringement by the vendor, an indemnity clause could require the vendor to protect the software development firm. Likewise, if a competitor of the software development firm claimed infringement by the firm, an indemnity clause could require the firm to protect the vendor. In either case, the obligated party may incur the cost of defending itself and the second party; however, the inconsistencies in the goals of the two parties may vary such that the second party chooses to take up its own defense. Responsibility and limitations of this separate defense may be specified in the indemnity clause. For example, a licensee required to indemnify and defend the licensor against a claim of infringement is not necessarily interested in maintaining the licensor's claim to the intellectual property and may be willing to cede such in a settlement. It would be to the licensor's advantage to obtain its own counsel to defend its position (Classen 2007).

Indemnity can also extend obligation beyond what is otherwise applicable by law. It can be used to reverse responsibility or obligation to protect the other party against a claim (Adoranti 2006). This is especially dangerous for the negligent licensee. "Increasingly, licensors are seeking to limit their identity and other liability to third party claims arising from the licensor's gross negligence and even have the licensee indemnify the licensor for the licensor's own negligence" (Classen 2007, 56). This poses a potentially devastating scenario as the licensee's obligation is tied to actions and events outside the licensee's control.

Vendors are increasingly incorporating third-party software into their products, thus the third-party warranties and indemnities affecting the vendor can extend through the license to the licensee (Overly and Kalyvas 2004). The licensee should look for a warranty addressing third-party licenses to assess the associated obligations and risk.

While indemnity against an infringement claim is a major focus, consequences of software errors pose significant risk as well. Suppose a software consultant uses a major vendor's development platform to create a system for a business. Managers at the business use the software to support making a strategic decision only later to discover a program flaw. Although the error may be correctly attributed to the vendor or consultant, indemnity clauses may dictate who bears the risk.

Remedy

The indemnity clause also specifies the extent of liability born by the responsible party. Generally it is the total amount suffered unless limited within the indemnity clause. This could include direct costs due to injury, lost opportunity costs, loss of intellectual property, loss of data and impact upon the reputation of the company
(Adoranti 2006). Indirect damages can expand and seriously erode the responsible party's financial standing.

The licensor will seek to limit its monetary obligation to the licensee prompted by the licensor's own infringement. Remedy may be offered in various forms: the vendor modifying the software to make it compliant, the vendor obtaining rights from the third party bringing the claim enabling the licensee's continued use of the product, or the vendor refunding all or a portion of paid fees and terminating the agreement (Gordon 2006). In each case the licensee may face a work disruption as the vendor and third party seek resolution. Obviously terminating the agreement may pose serious consequences for the licensee, especially if business processes are tailored to the software. Indemnity clauses may omit a deadline for vendor action which again could disrupt the licensee's business. That said, it generally is to the third party's advantage to negotiate with the vendor in order to gain monetary benefit as a result of the breach and to expand its product's use (Gordon 2006). Still, the licensee accepts risk when the licensor's indemnity is limited.

Indemnification can dictate whether contributory or comparative negligence applies. Contributory negligence is a defense where, if the plaintiff is found to have contributed to the cause of injury, the defendant is free of obligation to pay any damages. In contrast, comparative negligence assesses damages based upon of the defendant's degree of participation in the cause. In common terms, contributory negligence is all-or-nothing while comparative negligence is partial credit.

Examples of Indemnity

Indemnity clauses can be fairly simple as reflected in the following from a Macromedia® Dreamweaver® EULA:

> *You agree to indemnify, hold harmless and defend Macromedia from and against*

any loss, damage, claims or lawsuits, including attorneys' fees, that arise or result from the use or distribution of your application.

In this case Macromedia is requiring that the licensee defend Macromedia against claims stemming from the licensee's use of the program. This may be considered fair. A second example from the Apple® QuickTime® 7 EULA is a bit more complex:

6.1 Apple has no obligation to indemnify, defend of hold Licensee harmless from and against any claim that the Software licensed hereunder infringes any third party patent, copyright, trademark or other intellectual property right. Licensee will promptly notify Apple of any such claim.

6.2 To the extent permitted by applicable law, Licensee will indemnify, defend and hold Apple harmless from any and all claims, damages, losses liabilities, costs and expenses (including reasonable attorneys and other professionals) arising out of or in connection with Licensee's and its distributors' distribution of the Software, unless the claim arises solely out of the Software as originally provided by Apple to Licensee. The foregoing exception will not apply to a claim arising out of the combination of the Software with any other software or hardware. Apple will promptly notify Licensee of any such claim and will provide reasonable cooperation and assistance in connection with such claims.

Here Apple specifically declines to shield the licensee in case of its own infringement but requires indemnification from the licensee related to the licensee's actions.

Indemnity clauses are frequent, but not universal across EULAs. A review of a variety of applications found indemnity clauses in licenses for Microsoft SQL Server®, Visual Studio® and Office, Mozilla®, MySQL®, NetBeans®, and Corel® WordPerfect®. They also appear during installation of seemingly innocuous software such as print drivers and media players that may be installed by students in labs.

Potential Impact of Indemnity

Intellectual property indemnity claims are infrequent, but their effect can be severe. Overly and Kalyvas (2004) compare it to an earthquake, a very sporadic event with a devastating impact. "Added to the risk of infringement damages is the fact that typical, legal, and expert fees for patent litigation defense - from start of the lawsuit to the end of the trial - is two to three million dollars (not including appeals)" (Landy 2008).

For academic licensing, indemnity risk is not so evident. Obviously one should avoid taking on the licensor's risks unnecessarily. But an argument can be made that indemnity extends to student use. As part of a class project, a student, working with an outside organization, may create a "real-world" application using the institution's software then provide the application to the organization. If the application later fails, causing direct and consequential damage to the organization, who is at fault? While the proper use of academicly licensed software may be questioned, legal action by the organization requires a defense and that cost is incurred, in accordance with the indemnity clause, no matter the ultimate findings. Once a suit is filed, expenses mount, no matter the veracity or resolution of the case.

Academic programs at state institutions may find state policies disallow indemnity clauses in agreements. Private schools may have similar policies. Thus, an indemnity clause can become a "deal breaker" especially given clickwrap licenses are not negotiated.

Jurisdiction

Another clause that poses difficulty for academic institutions is jurisdiction. Licensors often limit software use to certain nations to avoid export restrictions and foreign court jurisdiction. Within the United States, licensors will also seek to restrict litigation to states and regions. This in turn, can limit indemnification to certain localities.

Generally both parties prefer to conduct court action in a state where they are headquartered or have a substantial presence. Travel to another state and obtaining counsel familiar with laws of that state may substantially increase litigation costs. This possibility grows in magnitude as the licensee obtains multiple license holdings tied to a variety of other states, as it does for the licensor as its customer base grows.

If no jurisdiction is specified, each party may well seek to file first to obtain leverage in the litigation. The case history of that state then influences the outcome. If neither party concedes this clause, a compromise is selecting neutral jurisdiction such as New York (Gordon 2006).
In addition to increased expenses due to litigation at a distance, Classen (2007) and Landy (2008) cite differences in state laws that can affect the legal proceedings:

- Virginia and Maryland are the only states that adopted the aforementioned UCITA, considered favoring vendors.
- UCC is basis for state law in all states except Louisiana.
- Some, but not all, states recognize "exemplary" or "punitive" damages.
- In several states, under the UCC, a basis for implied indemnity exists when a third party incurs damages due to a product failing to meet warranties.
- Some states, including New York, New Jersey and Texas have not adopted the UTSA.
- Certain states uphold indemnity clauses, even when it appears the agreement unduly favors one party, if the indemnity is obvious and clearly stated in the license.
- States vary in interpretation of non disclosure agreements under trade secret law.
- Sovereign immunity, that is, the ability to sue the state, is embraced to varying degrees across states, an issue potentially affecting litigation against state institutions.

As described before, states also vary in guidelines for awarding the plaintiff's claim in full or in

part. While most states embrace comparative negligence in its pure or modified forms, Alabama, Maryland, North Carolina, Virginia and the District of Columbia maintain pure contributory negligence (Matthiesen, Wickert and Lehrer 2009).

Signature Authority

Many institutions adopt a signature authority policy that restricts employees from committing the school to financial and legal agreements. In some cases, the individual can be held personally responsible for unauthorized commitments. Institutions may require all software licenses be reviewed by a central authority, e.g., Johns Hopkins University (2006). For a school of any size, such a policy, while strategically sound, appears operationally problematic. Substantial resources are required to examine clickthrough licenses attached to all software, including print drivers, presented only during installation.

An Academician's Response

In conclusion, academicians should follow certain measures. The academic licensee has basically no leverage in negotiating an academic license as vendors often have no financial incentive to allocate attorneys to revising license agreements for nonpaying customers. Thus, balancing institutional protection with academic demands can pose a special challenge for faculty in a computing-related discipline and for lab coordinators. Ultimately, it is a decision assessing liability risk in comparison to academic need. There are several steps a faculty member can take toward a proper balance.

1. Read the license.
2. Cooperate with the signature authority to avoid personal risk.
3. Preemptively examine software licenses before related book adoptions or other commitments.
4. Document the academic need for each title installed.
5. Maintain a file of all licenses.

In addition, lab coordinators can take additional steps:

6. Enforce tight controls over software installations in labs.
7. Use a license management tool that maintains seat counts as well as jurisdiction information (Overly and Kalyvas 2004).
8. Communicate the risks of indemnity and jursdiction to faculty and students.
9. Enlighten those who have signature authority concerning the proliferation of clickthrough licenses. If possible, obtain parameters within which one may install without further license review. If not possible, explore creating a fast-track review process for less-complex licenses.
10. Create and publish lab policies for student labs restricting use to academic purposes. Reenforce the policy with a clickthrough at logon.

If these steps are followed, faculty, students and administrators, working cooperatively, can gain a proper perspective of licensing risks and make wise decisions in weighing risk with academic need.

Note

The author does not hold a license to practice law and has received no legal training. The reader should not consider this paper sound legal advice, but should instead consult legal counsel in making decisions regarding topics discussed here. In other words, NO WARRANTY NOR INDEMNITY IS EXPRESS OR IMPLIED.

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Nurturing Faculty Use of Technology through Learning Communities

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Abstract

The work of Alexander Meiklejohn and John Dewey in the 1920s and '30s gave rise to the concept of a learning community. Increasing specialization and fragmentation in higher education caused Meiklejohn to call for a community of study and a unity and coherence of curriculum across disciplines. Dewey advocated learning that was active, student centered, and involved shared inquiry. A faculty learning community (FLC) is a cross-disciplinary faculty and staff group of 8 to 12 members engaging in an active, collaborative, yearlong program with a curriculum about enhancing teaching and learning and with frequent seminars and activities that provide learning, development, interdisciplinarity, the scholarship of teaching and learning, and community building. Learning communities address the teaching, learning, and developmental needs of faculty and staff combating the isolation, fragmentation, or chilly climate in the academy. (Miami University's Center for the Enhancement of Learning and Teaching. 12 January 2009. .). The College of Mount St Joseph has had a wireless network and a mandatory notebook computer requirement for traditional, full-time students since January, 2001. We regularly offer technology training classes, one-on-one sessions and best practice workshops for faculty. While these efforts are somewhat successful, we found that Learning Communities are an excellent way to keep faculty motivated to explore and implement technology in their teaching. Miami University began facilitating Faculty Learning Communities in 1979 and has had similar findings. Miami is currently hosting three learning communities that address the intersection of technology and learning. Managing Learning Community membership and meetings, ideas for initiating quality discussions, the importance of a strong facilitator and assessment measures and successes and challenges will be discussed during the presentation.

Note: The author was not able to submit this paper before the Proceedings went to print. She will supply copies or a link to a website where copies may be obtained at her session,

Utilizing a Faculty Learning Community to Support Collaborative Online Course Development

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Miami University was founded in 1809 and was the 10th public university in the United States. Miami was named for the indigenous people who originally inhabited the area now known as the Miami Valley. Today, Miami is a residential university with a focus on teaching undergraduates. A liberal education core complements the more specialized studies of the majors. Miami enrolls 14,488 undergraduates and 1,812 graduate students on the Oxford campus. Miami offers the bachelor's degree in over 100 areas of study and the master's degree in more than 50 areas; Miami also offers a number of doctoral degrees.

In 1966, Miami University Middletown became the first regional campus in the state of Ohio. Miami University Hamilton was founded just two years later. This year, Miami added a third regional campus in West Chester, the Voice of America Learning Center. The Middletown campus currently enrolls just under 2000 students and the Hamilton campus has approximately 2800. Both campuses offer a variety of certificate programs and associate degrees. In addition, the regional campuses offer three bachelor's degrees not available on the Oxford campus. Graduate degrees in education and business are also available on Miami's regional campuses.

Within a 1 hour drive from Middletown, there are approximately 32 Ohio institutions of higher learning – many of which offer online courses and degrees. In addition, we have seen University of Phoenix and Indiana Wesleyan (both with online programs) build physical campuses less than 15 minutes away. Facing increasing competition, Miami's regional campuses have experimented with a variety of options making a college education more accessible to students (e.g., courses that meet in evenings, only on Saturdays, run for half a term, etc…)

Despite increasing competition, Miami has been hesitant to explore online teaching and learning. Many of our faculty question whether students can be sufficiently engaged and are doubtful that

courses encouraging critical thinking could be designed. Others simply found "online" a poor "fit" with our "traditional", public ivy image.

At the same time, Miami's regional campuses were facing issues in trying to provide accessible services to our own students. Increasingly we find our students struggling to balance school with work, family and personal issues. Our nursing students are excellent examples. Many nursing students are "non-traditional" with an increasing number from the "sandwich generation" – having both young children and aging parents to care for. In addition, most begin working full time once they earn their associate's degree. Trying to juggle the demands of child care, aging parents and a full time job are difficult enough without being pressured by employers to take courses to finish a BSN.

Consequently, the regional campuses decided nursing would be Miami's first fully online program slated for development.

Unfortunately, most nursing faculty had NO interest in teaching online. The faculty were concerned about the time commitments of both developing and teaching online courses and questioned if online courses foster the kind of connections they felt with their students.

Our solution to this problem was twofold. First, we surveyed students regarding their attitudes about online courses. The positive responses to this survey helped convince some nursing faculty to pursue online options. However, many of the faculty were still hesitant.

Prior to this point Miami followed a fairly standard course development model. Individual faculty met with an instructional designer who helped them create their online course. Most of the interaction focused on course development and did not address issues related to teaching online courses. There was little, if any, interaction with other faculty developing online courses at the same time.

Because we were developing a program (rather than individual courses) and because the nursing faculty felt strongly that courses should have a similar look and feel, we decided courses had to be developed with some collaboration. Since faculty learning communities (FLCs) have been a part of Miami since 1979 and are very well received, we decided to explore this option for online course development.

We realized that a FLC offered the opportunity to simultaneously discuss and learn about course development and to address broader faculty concerns about online teaching and learning. The collaborative and learning based format of FLCs offered a low risk, high gain opportunity for faculty and developers alike to learn from one another while developing a sense of mastery. One additional advantage of this model was a built in a sense of accountability. Completing online courses in a timely manner is often a problem. However, in an FLC, everyone reported to the group and the group encouraged everyone to reach their goal.

As a whole, our learning community had two goals. First, we wanted to have 6 courses fully developed, peer reviewed, edited and ready to go by the end of the year. Second, we wanted to ensure all online faculty felt confident and prepared for their first semester of online teaching.
Our learning community consisted of 11 members. Seven nursing faculty participated in the learning community, six as course developers and one as an experienced online instructor. Each

faculty course developer focused on one course while providing feedback and acting as a peer reviewer for others. The experienced online instructor had taught for 2 years andgave insight into what students were like and what might be problematic in an online course or teaching online. We also included a librarian to address research copyright issues and two instructional designers. The learning community was facilitated by the Center of Online Learning director who also teaches full time in physics.

Ideally the learning community would have met every three weeks. However, scheduling difficulties led us to meet approximately once a month. Each meeting had three parts: project check-in, course development topics and online pedagogy topics. Project check-in allowed us to maintain a timeline and accountability for course development while allowing instructors to work collaboratively on issue that arose in their particular courses. There was a high level of discussion in all meetings. Some of the topics we addressed are included below.

Course Development

- What does a high-quality online course look like?
- Redesigning starting with course objectives.
- Making full use of Blackboard
- Online resources(databases,articles, etc)
- Effective presentation techniques.

Pedagogy

- Creating a sense of community online.
- Engaging online students.
- Time management.
- Assessment techniques.
- Effective online communication.
- Handling academic dishonesty.

Our last learning community meeting showcased the newly developed online courses for the entire nursing department. All nursing faculty were invited to attend a catered lunch. Faculty developers showcased their courses and demonstrated the unique aspects. The faculty developers discussed the learning community and the course creation process. Faculty were then encouraged to volunteer for the second year of the learning community.

Learning community meetings were supplemented by a high level of online communication via email, listserv and an organizational site of the learning community inside our CMS. In addition, each faculty developer met individually on a weekly or bi-weekly basis with an instructional designer to focus on their specific course. Learning community meetings were often informed by topics that emerged from these meetings. Five of the six faculty developers reported that this was just enough time with an instructional designer. One faculty developer reported that more time was needed.

At the end of the first year, learning community members were asked to complete an anonymous survey designed to assess the effectiveness of the learning community in meeting its goals, as well as to assess participants' satisfaction with the learning community. With regard to meeting its goals, the results of the survey indicated that participants agreed that the learning community met all of its goals (See Table 1).

There was also a high level of agreement that the faculty learning community was helpful in educating participants about the process of online course development and expectations for online courses, as well as actually developing an online course (See Table 2).

Finally, the survey results showed that participants were confident that they could successfully develop and teach online courses (See Table 3).

There are anecdotal signs of success as well. For example, when one faculty developer had to resign from the learning community, another member volunteered to construct the course over the summer break. Ironically, the person who volunteered was the most vocal opponent to online learning when we began. This individual also reported that she almost "felt bad" for students who took her course in the past. Despite her glowing course evaluations from students, she felt the online course development process created a significantly better course.

In addition, faculty requested the learning community be extended an additional year. We were fortunate to receive a grant from the Ohio Learning Network to support this and are currently continuing the learning community to support faculty in their first year of online teaching. This extended learning community is also providing support for in-time and reflective revisions to the online courses based on the experiences teaching.

Our survey did indicate areas we needed to improve in our learning community model. While we attempted to keep the course development on a defined timeline, the amount of additional work expected from nursing faculty (clinicals, etc.) continually required the timeline to be adjusted. Several faculty developers indicated they wished the timeline had been more defined. In addition, while we tried to remain true to the learning community model of a community working together to better understand a topic, there were times the instructional designers needed to assume "expert" roles. While not an issue on its own, some faculty reported that this was confusing when the IDs disagreed.

The main area for improvement was actually outside the learning community. One need that emerged from learning community discussions was an orientation for new students to explain how online courses work, define expectations, address assumptions/myths about online learning, and advising students about how many courses to take. Despite being required to complete this orientation, some students did not realize how rigorous and demanding the online courses would be. This was reflected in some negative course evaluations. For faculty who are used to receiving glowing course evaluations, this was particularly difficult. Although this will change as students take more online courses and become more familiar with expectation, some student misunderstanding is a result of pedagogical difference between online bachelor's courses and face-to-face associate's courses.

We are currently in the second year of using this faculty learning community model for course development with nursing faculty. This spring, we began an additional learning community to support online course development for the Business Technologies department. With limited funding, this learning community is abbreviated (meeting for just one term) and learning community members will receive no professional development funds for their participation. This will be a real test to the model.

Table 1.

Item	Percentage Agreeing or Strongly Agreeing
One of the goals of the Nursing Faculty learning Community was to promote your interest in developing online nursing courses. How effective was the learning community in meeting this goal?	100%
One of the goals of the Nursing Learning Community was to learn how technology can be used to strengthen nursing courses. How effective was the learning community in meeting this goal?	100%
One of the goals of the Nursing Learning Community was to build confidence in developing online nursing courses. How effective was the learning community in meeting this goal?	100%

Table 2.

Item	Percentage Agreeing or Strongly Agreeing
The learning community meetings were helpful in educating me about the process of developing an online course.	60%
The learning community meetings were helpful in educating me about the expectations for online courses.	80%
I learned a lot about developing online courses from my participation in this learning community.	100%

Table 3.

Item	Percentage Agreeing or Strongly Agreeing
I am confident that I will be successful in building online courses in the future.	100%
I am confident that I will be successful teaching an online course.	80%

Off to Camp We Go …

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For the last year, the University of Indianapolis has provided weeklong Summer and Winter Camps to help keep faculty abreast of the latest instructional technologies. During Camp, faculty serve as *Camp Counselors* demonstrating for their colleagues how they have integrated various Web 2.0 technologies into their teaching. Camp Counselors are selected from previous Camp attendees. Camp Counselors not only assist their colleagues during the camp but also help host the various sessions conducted during Camp.

Camp typically consists of five days; however this year's Winter Camp was shortened to four days to avoid conflicting with another faculty development opportunity. This year's Winter Camp introduced faculty to sessions covering micro-blogs, social bookmarking, start pages, aggregators, wikis, blogs, collaborative tools, chat tools, social networking, and associated applications.

Eight faculty attended the first Summer Camp in June 2008. Twenty-four faculty registered for Winter Camp in January 2009. Having Camp in the summer appears to be preferred, otherwise, Camp conflicts with start-of-the-year activities that are typically encountered prior to the start of a semester. Plans are underway to offer another Summer Camp this June.

Camp is structured with Web 2.0 topics presented during the morning sessions. Discussion continues with Camp Counselors dispersed across various tables during a shared lunch. Afternoon sessions are devoted to hands-on activities, with assistance provided by Camp Counselors. This year's Winter Camp schedule was as follows:

Monday, January 5th	
9:00 a.m. – 9:30 a.m.	Camp Overview
9:30 a.m. – 10:15 am	Using Blogs in Instruction
10:15 a.m. – 11:00 a.m.	There's More to Wikis than Wikipedia
11:00 a.m. – 12:00 p.m.	Google Apps: Is Google the Next Microsoft
12:00 p.m. – 1:00 p.m.	Lunch Break
1:00 p.m. – 4:00 p.m.	Hands-on Development
Tuesday, January 6h	
9:00 a.m. – 9:30 a.m.	What's a Twit with Twitter?
9:30 a.m. – 10:15 a.m.	Chatting with Your Students Using Meebo
10:15 a.m. – 11:00 a.m.	Social Bookmarking with Del.icio.us

11:00 a.m. – 12:00 p.m.	Aggregating RSS Feeds with NetVibes
12:00 p.m. – 1:00 p.m.	Lunch Break
1:00 p.m. – 4:00 p.m.	Hands on Development
Thursday, January 8th	
9:00 a.m. – 9:30 a.m.	Using Wordle to Crate Tag Clouds
9:30 a.m.. – 10:00 a.m.	Finding Resources on YouTube and TeacherTube
10:00 a.m. – 10:30 a.m.	Need to Find Photos? Looking for PowerPoint Resources? Check out Flickr and SlideShare
10:30 – 11:15 a.m.	Adding Narration to your PowerPoint Presentations with SnapKast
11:15 a.m. – 11:45 a.m.	A Treasure Hunt – What Resources Can You Find?
11:45 a.m. – 12:00 p.m.	A Quick Peek at What You Found On Your Treasure Hunt
12:00 p.m. – 1:00 p.m.	Lunch Break
1:00 p.m. – 4:00 p.m.	Hands-on Development
Friday, January 9th	
9:00 a.m. – 12:00 p.m.	Camp Revue – Faculty Showcase
12:00 p.m. – 1:30 p.m.	Celebration Luncheon

Camp Survival Kits were distributed. Kits included many resources which are available on the EDUCAUSE Learning Initiative (ELI) site: the *7 Things You Should Know About …* series and the ELI Discovery Tool, *Applying Technology to Teaching and Learning*. Related articles from *EDUCAUSE Review* and the *EQ* (*EDUCAUSE Quarterly)* were included. Software quick tip guides were also provided in. A wiki was created to house Camp materials. A social networking site (for Winter Camp) was used to promote use of the tool and to maintain longer-term contacts.

The Camp Wiki has been a work-in-progress. It was originally created during Winter Camp 2008. It provides access to the camp schedule, numerous resources, workshop resources, information on Web 2.0 (and 3.0) technologies, and a wealth of articles. The article list is updated regularly. The Camp Wiki is located at http://uindyelearningresources.pbwiki.com/ While it was created for password access only, please e-mail kiggins@uindy.edu to request access.

During Summer Camp attendees posted daily reflections to the Camp Wiki; we made an attempt to post Winter Camp reflections on Ning. Ning is a social networking site similar to FaceBook, enabling users to create interest specific social networking sites. Unfortunately, since the idea to integrate Ning came about after the schedule had been built, no time was built-in the schedule for Ning. We provided a short overview, but Campers were left to their own interests as to whether or not they wanted to take advantage of this resource. In the future we plan to make better use of this tool, as it could continue to be very useful once the camp has ended. On the final day, Camp attendees were invited to participate in a *Camp Revue*, showcasing the various projects they had created during the week. The campus community was invited to attend; a special invitation was sent to the Deans.

We created a Web 2.0 Community of Practice that meets twice monthly to showcase and discuss current developments with the integration of Web 2.0 technologies into their teaching. We meet a couple of different days and times to meet the scheduling needs of previous Campers. Interested members of the campus community are encouraged to attend.

Camp has enabled us not only to introduce the tools to the faculty, but also to develop a sense of community and continued support long after camp has officially ended.

We continue to enhance the Camp experience. This year's Summer Camp will better integrate use of the ELI Discovery Document, *Applying Technology to Teaching and Learning.* We will also assign facilitators to each of the Camp participants; facilitators will be assigned based on disciplines and learning objectives. Current plans include spending the first day: (1) discussing the ELI document, (2) develop the participant's learning objectives for their course, (3) identify problems and possible changes to their course, (4) discuss the relationship between technology integration and learning objectives, (5) determine how integration of tools might be assessed, and (6) begin to design assessment rubrics. We will also discuss exactly what Web 2.0 is and demonstrate Web 2.0 applications that might already be familiar to the participants. We will introduce the Camp Wiki site; confirm accounts on Twitter (a micro-blog) and Ning prior to lunch. After lunch we will discuss Twitter and Ning. We'll also use Wordle to create word clouds. Wordle creates a word cloud from a block of text entered by the user; the size of the text is dependent on the number of times the word appears in the text. The user can modify the design, color, and layout of the word cloud.

Day 2 will commence with a thirty-minute review of the previous day's activities. The second day of Camp will be devoted to Finding and Utilizing Resources on TeacherTube, YouTube, iTunes, Flickr, SlideShare, World Lecture Hall, and Academic Earth. After lunch a treasure hunt from the morning's resources will be conducted. Upon conclusion of the afternoon's development time we'll have a short show and tell of what the participant's worked on and how those can be tied back to their learning objectives.

The concentration during Day 3 will be on collaborative tools. We will again begin with a thirty-minute review of the previous day's activities, conduct a short question and answer session and discuss treasure hunt findings. Time will be built-in to demonstrate and begin to use Meebo, Del.icio.us, NetVibes and the Google Applications. We will demonstrate how to create RSS feeds from library databases and various Web resources into NetVibes. The afternoons will provide development opportunities.

The focus of Day 4 will also be collaboration. Again we will review the previous day's activities and provide ample time for questions and answers. We will discuss blogs and wikis – commonalities and differences. Ample time will be built-in to explore both technologies. Audacity, GarageBand and Podcasting will be discussed in the morning session. Development time and show and tell will comprise the afternoon hours.

Day 5 – it's Friday – the Camp Revue or a faculty showcase has been what the entire week has been leading up to. We are considering starting with a small fair where everyone (camp participants and members of the campus community) can walk around and look at what everyone else has been working on. Participants, members of the campus community (with a special initiation to the deans) will be invited to a special luncheon in honor of the Camp participants. Following lunch each Camp attendee will provide a short presentation discussing their learning objectives and how those have been met with their week's activities.

Lessons learned include (1) start camp with easy, fun-to-use topics, (2) make sure all computers are functioning prior to the start of camp (3) ensure all attendees have created their accounts with each off site application, provide them with a checklist to ensure they create all their accounts. We'll continue to improve future camps with lessons learned from previous camps.

Recommended Resources

Academic Earth http://academicearth.org/
Audacity http://audacity.sourceforge.net/
Camp Wiki http://uindyelearningresources.pbwiki.com/
Del.icio.us http://delicious.com
EDUCAUSE
7 Things … http://educause.edu/7ThingsYouShouldKnowAboutSeries/7495
Guide to Blogging http://educause.edu/eli/GuideToBlogging
Guide to Podcasting http://educause.edu/GuideToPodcasting
EDUCAUSE Quarterly http://educause.edu/eq
EDUCAUSE Review http://educause.edu/er
ELI Discovery Document Applying Technology to Teaching and Learning
http://educause.edu/12461
Flickr http://flickr.com/
GarageBand http://apple.com/ilife/garageband/
iTunesU http://itunes.com
Download and install iTunes, Access iTunesU from the iTunes Store
Meebo http://meebo.com/
NetVibes http://netvibes.com
Ning http://ning.com/
SlideShare http://slideshare.net/
TeacherTube http://teachertube.com/
Twitter http://twitter.com
YouTube http://youtube.com/
Wordle http://wordle.net/

Is There an End to Death by PowerPoint?

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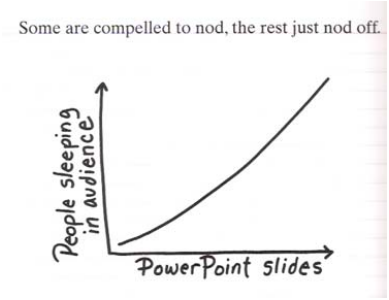
Have you grown weary of PowerPoint presentations that present a great deal of text and then are read to you by the presenter? Would you prefer to see graphics and key points, enabling you to listen to the material being presented? In her book, Indexed, Jessica Hagy indicates there is a direct correlation between the number of PowerPoint slides and the number of people sleeping in the audience. (Hagy, 2008) Pecha Kucha and other web resources can be of great assistance in putting an end to *Death by PowerPoint*.



Architects Astrid Klein and Mark Dytham, in Japan, created Pecha Kucha. Their goal was to give designers a chance to meet, show their work and network with others. (Wikipedia) Pecha Kucha, pronounced, "peh-chak-cha" is a PowerPoint presentation format where the presenter shows twenty slides for a period of twenty seconds each for a total of six minutes and forty seconds. The term pecha-kucha refers to the sound of conversation or chit-chat.

Pecha Kucha Nights are held worldwide. Presenters generally come from the design, architecture, photography, art, and creative fields. Pecha Kucha is beginning to be carried over to the academic and business. (Pecha Kucha, 2009) "Businesses use the Pecha Kucha format, especially for internal presentations, primarily as a device to limit the length of presentations, force presenters to focus their messages, reduce interruptions, and ultimately avoid "death by PowerPoint"." (Pecha Kucha, 2009)

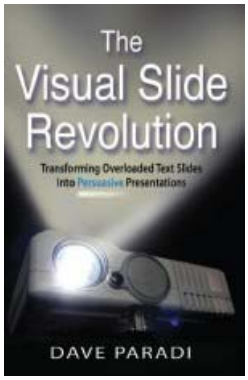
Using Pecha Kucha, presenters are forced to develop a thorough understanding of their material so they can get to the point in a limited amount of time. When giving a presentation, style and technique are incredibly important using the Pecha Kucha technique. Pecha Kucha presentations are typically heavily laden with graphics rather than text. This presentation format makes it difficult to go into significant detail on the topic, however, when combined with discussion afterwards it can work well.

Presentation Zen (http://www.presentationzen.com/) is another great resource for re-thinking the design of PowerPoint presentations. The following articles are available on their website:

- *What is Good PowerPoint Design,* September 5, 2005. The importance of simplicity, content and context are discussed; examples of visual makeover slides are presented.
- *Brain Rules for PowerPoint and Keynote Presenters,* May 20, 2008. Discussed the book Brain Rules by John Medina and key takeaways from the book.
- *Pecha Kucha and the Art of Liberating Constraints,* September 27, 2008. The article discusses practical applications as well as provides examples.

Another tactic to end *Death by PowerPoint* is to follow the strategies identified by Mr. Dave Paradi. How to make more effective presentations and a wealth of other resources are available on his website at http://www.thinkoutsidetheslide.com:

- A seven-day PowerPoint e-course
- Bi-weekly newsletter
- Slide maker video podcast
- PowerPoint tips blog
- Numerous Resources for Presenters



In his book, The Visual Slide Revolution, Mr. Paradi discusses a five-step method that explains how to create persuasive visuals.

All of these resources should enable you to create more effective presentations and teach your students to do the same.

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Project-Based Assessment of Learning in Online Microsoft Office Application Courses.

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Abstract

Over the past six years, courses in Microsoft Word, Excel, Access, and PowerPoint at North Central State College have evolved from face-to-face to online courses. In the face-to-face courses, students were assessed via proprietary computer-based multiple-choice exams and skill assessments, as well as solving identical problems. These assessments were transformed into four individual projects that allowed maximal creativity within rigid specifications that met the course objectives. The four Microsoft applications placed special demands on students and the projects attained varying degrees of success in meeting the goals of the courses. Most notably, the higher the familiarity students had with the concepts behind the application being taught, the greater the success of the method. There is evidence that the addition of a peer assessment exercise decreased the proportion of students withdrawing from the courses, but it did not affect the proportion of students unsatisfactorily overall.

Introduction

Courses at North Central State College use to teach students the Microsoft Office suite are divided by major application: Word, Excel, Access, and PowerPoint. Six years ago these courses were taught using the face-to-face methodology and employing a fixed set of exercises and test instruments. A single publisher's books were used for all four applications, all of which were divided into eight chapters. The courses lent themselves to being divided into two units of four chapters each, with the midterm examination coming after the fours chapter and the final examination after the eighth.

The book for each application contained labs within each chapter, each with detailed instructions and copious illustrations showing students how to complete the lab tasks. The labs built well on each other so that, if the student worked through the labs from beginning to end, they would be assured of a smooth and thorough grounding in the principles and skills developed by the labs. Each chapter also had a series of exercises and projects at the end that mirrored the chapter labs. The exercises were in recipe form similar to the labs so that, when completed, all students would have produced identical products. Students were asked to submit these exercises, differentiating their work from others by adding a header or footer with their unique information.

An online exam was also supplied by the publisher. It consisted of selectable questions in several formats, including multiple choice, true false, and skill questions which simulated the interface of the application being tested. These skill questions were generally well conceived, but they fo-

cused on single, small skills and sometimes did not include some features that were available in the actual application, such as right-click menu options. Students sometimes found these questions somewhat "rigid" as they forced them to perform tasks in what they considered an unnatural manner.

In summary, the Microsoft Office courses as they were taught six years ago consisted of an instructor demonstrating the labs in each chapter to students of various entry level skills. Some would find the pace too slow, others too fast, and for those for whom this was the first course ever working with computers, it was overwhelming. While the exercises were easy to grade, they provided no real demonstration of the scope of skills the students were learning. They also could be easily copied, providing abundant opportunity for students to submit the work of others. The online exam questions were also easy to grade, but they tested at the individual skill and concept level and did not let students demonstrate what they knew about combining the skills and concepts to create a finished product.

The First Changes

Several important steps were taken six years ago to address the problems students were having in the Microsoft Office courses for two reasons. First, some students were finding the courses at too difficult a level initially. These students either did not have the necessary skills with the Windows operating system interface (e.g., moving among multiple windows, file management), or they lacked the keyboarding speed to keep up with the course. Second, the administration had requested that these courses be offered in an online format. This posed a problem with using the online exam as students taking it online could easily refer to their books to answer the questions.

As a solution to the first problem, a pretest was initiated that all students wanting to take their first Microsoft Office course would need to pass. The pretest comprised a test of knowledge about the Windows operating system and a test of keyboarding speed. Students not receiving the minimum score in either test were required to take a course on the Windows operating system or keyboarding as needed. This requirement has essentially eliminated students dropping out of the Office courses for lack of preparation.

The second problem proved more difficult to solve. The first version of the online course simply took the elements of the face-to-face course and carried them over into the online environment. The students were required to compete the problems at the end of each chapter the same as face-to-face students. This was before the college had adopted an online course management system, so all communication between students and the instructor was through email, and assignments were submitted as email attachments. Three on-site visits were required of these online pioneers: the first for an orientation, and the second and third to take the midterm and final exams, respectively. Thus the face-to-face instructional design was carried over into the online world as closely as possible. This provided instruction that was as close to the face-to-face experience as possible and also allowed time for the mechanics of the online teaching process to be mastered.

The Conversion to a Project-Based Assessment

The goal of each of the Office application courses is to bring the students from the novice level to some level of competence short of expertise. Dreyfus and Dreyfus (1986) described acquiring expertise as a process that moved problem solving from conscious analytical thinking to intui-

tion. Novices learn rules and heuristics and then following them to the letter as they complete tasks. Experts on the other hand become unconscious not only of how in detail they perceive the situation (the perception becomes simply a feeling) but also of the performance needed to react to it. An expert performer is immersed within the performance and responds smoothly and intuitively.

Zeitz and Spoehr (1989) found that the mental organization of their learners went through three developmental stages to reach the level of expertise. In this early stage, the few knowledge chunks novices acquire are generally small, disconnected, poorly organized, and centered on surface characteristics. The domain seems overwhelmingly complex and learners grasp for hooks that relate what they are learning to knowledge in domains they have already mastered. During the second stage, learners wean themselves from borrowing knowledge from outside the domain to cope with the new learning. They have now mastered the scope of the domain and arrange its knowledge in an "orderly, hierarchical fashion" (Zeitz and Spoehr, 1989, p. 328). During the third stage of expertise, continued application of learning to real-world problems and the unique demands those problems make uniquely reworks the domain's cognitive organization and produces complex, personalized expertise. Thus, as expertise develops, learning slowly shifts from acquiring surface knowledge to constructing deep knowledge.

Reflecting on this theory of expertise development, the use of the assignments at the end of each book chapter and the online exam questions with their emphases on individual skills was an appropriate way to begin teaching novice students how to use the Microsoft Office applications. The surface elements of fonts, colors, words, and their placement in documents, cells, or slides is a proper emphasis for these novices. The problem is that the demands of these assignments and exam questions did not lift the students beyond this novice level. It did not give them the opportunity to demonstrate mastery of the knowledge of each application through the creation of some product that required the arrangement of those elements. That seemed to require a project of some sort.

Yet students could not simply be given a project and told to demonstrate the skills they learned without guidance. Kirschner, Sweller, and Clark (2006) note that research shows students need adequate information to learn effectively and efficiently. Problem solving in a domain is a skill experts have mastered, not novices. To be effective, "learners should be explicitly shown what to do and how to do it" (p. 79). Thus, an assignment was needed that told the students exactly what to do and how to do it while leaving them enough flexibility to apply what they were learning in a creative way.

A guided project was chosen both to guide the learning and to assess course content mastery. The students are given a scenario for the item to be produced as well as a detailed list of specifications that they must meet within the project, providing the detailed *what to do* for the assignment. This is similar to the process worksheets discussed by Van Merriënboer (1997) that give the steps required to solve a problem, along with hints and heuristics for completing the assignment. The *how to do it* for the assignments would be given in recipe-like instructions in the textbook and online tutorials, along with personal help via email as needed.

To keep the workload manageable, course content is spread across four projects to be completed over the life of the course, one project for each pair of chapters in the textbook. The scenario and the specifications are carefully linked to the skills and knowledge taught in each pair of chapters

so that all of the information needed by students to meet the specifications can be found in the current two chapters under consideration.

Peer Evaluation

During the 2005-2006 academic year, the guided projects were instituted in both the online and face-to-face formats of all Microsoft Office courses: Word, Excel, Access, PowerPoint, and Advanced Excel. A study done in the summer of 2006 (N = 173) found some interesting comparisons between the grades earned by students in the two delivery formats. Since no students took the same course in both formats, an independent-measures T-test was performed to see if there was any difference between the two groups in the average GPA of students at the start of the course or the average grade earned. The starting GPA of face-to-face students who did not withdraw (N = 23, M = 2.67, SD = .715) compared with online non-withdrawing students (N = 106, M = 3.12, SD = .537) was significantly lower, t(127) = -3.143, $p < .001$ (2-tailed). The average grade earned by face-to-face students (M = 2.36, SD = 1.25) was also significantly lower than that earned by online students (M = 3.02, SD = 1.30), t(127) = -2.196, $p = .03$ (2-tailed). Since the face-to-face students began with a lower starting GPA, it is also natural to expect them to earn a lower grade on average. When the difference between entering GPA and earned grade is averaged for both groups, the difference is not significant, t(127) = -.697, $p = .487$ (2-tailed). Thus, it seems safe to conclude that the difference in grades earned by both groups is due largely to the previous academic success of each group as reflected by the entering GPA rather than the instructional method used.

What is of greater concern is the large number of students withdrawing from the course or receiving a failing grade. The principal reason why students fail these courses is for not submitting projects. Of the 173 students tracked during the 2006 academic year who took both face-to-face and online courses, 42 (24.3%) withdrew and received a grade of W, while 27 received a grade less than a C, 14 (8.1%) of those an F. The total number of students receiving a W or F was 56 (32.4%). On the other hand, 104 (60.1%) of the students received a grade of C or better, 51 (38.9%) earning an A. In courses such as these based on clear expectations within the reach of nearly all college students, such a pass/fail bifurcation was expected. What was desired was an additional method that would increase the number of students passing and receiving A's.

One essential behavior needed for gaining expertise in any area is critical self-appraisal. It seems true that we can often see in the work of others errors that we are blind to in our own. In that spirit, a peer review was initiated in Microsoft Office courses for the 2008-2009 academic year. These required students to submit their projects to a discussion board after they had submitted them to the instructor for grading. They were then asked to evaluate the project of one other student and, after reading the comments made about their own project, to critically review it, also. The students were asked to highlight one excellent substantive aspect of the project, and one significant area that could be improved along with a suggestion on how to improve it.

In one sense, evaluating the projects of others became what Kirschner, Sweller, and Clark (2006) called a worked example, an instructional method that seemed especially appropriate for guiding novice learners to master the behaviors needed to successfully complete the projects. Worked examples are fully complete and correct examples of work the learner is learning to do. Such examples decrease the load on working memory, freeing more cognitive load to apply toward learning how to solve problems. The examples constructed by others similarly reduce cognitive

load as the students are not engaged in constructing the projects. This frees up working memory that students can apply toward deconstructing the projects to see how they fulfill the project requirements. Performing such "reverse engineering" is expected to enhance the learners' insights into applying the skills learned in the course in more critical ways.

The peer evaluation has been met with general approval by the students. During the winter quarter, participants in online sections of Word, Excel, and PowerPoint were asked to rate their agreement with the statement *Viewing and evaluating the documents posted by classmates (on the Discussion Board for Peer Evaluations) was an effective assignment to learn new, different, or better ways to use the tools in Microsoft Word/Excel/PowerPoint.* Of the 105 learners who entered a rating, 85 (81%) agreed or strongly agreed with the statement. Students provided comments about their experience with this learning activity, and the most common opinion (50%) was that it helped to see how others applied the skills and to gain a new perspective of how to do the project. Also, by reading the evaluation that was posted for their own project and by studying their classmates' worked examples, the students were able to improve their work on future assignments (38%). There were a number of students (17%) that felt they were able to help their peers with their suggestions and comments. And there were some (4%) that felt this assignment gave the course a "classroom feeling" and it allowed them to connect with their classmates. However, Kirschner, Sweller, & Clark (2006) explain that the worked-example effect will reverse as the learners' expertise increases. The advanced students who were very proficient in the application reported that this activity was not helpful (2%).

A further indication of the usefulness of the peer evaluation is the decrease in the number of students withdrawing from the Office courses as shown in Table 1. During the 2008-2009 academic year, a total of 462 students were tracked. Of those, 47 (10.2%) received a grade of W, while 73 (17.7%) received an F for a combined total of 120 students (26.0%). Thus, the proportion of students receiving a W or an F was reduced by 6.4%, with the proportion withdrawing dropping by 14.1%. The number of students receiving a grade of C or better was 310 (67.1%), an increase of 7.0% over the 104 (60.1%) of the 2006 group. Overall, then, the withdraw rate was greatly reduced and the pass rate slightly increased. Student performance has been pushed more toward the A level, indicating greater mastery of the knowledge and skills of the applications being learned. As neither the projects being used nor the course content have been altered between the 2006 and 2009 offerings of the courses (other than changing from Office 2003 to Office 2007), these changes are considered generally to reflect the effect of the peer review on the performance of students in the courses.

Table 1
Grades Earned by Students in Microsoft Office Courses, 2006 and 2008-2009

Grade	2006	2008-1009
Total Students	173	462
Number of W's	42 (24.3%)	47 (10.2%)
Number of F's	14 (8.1%)	73 (15.8%)
Number of W's + F's combined	56 (32.4%)	120 (26.0%)
Total Below C (including W's)	69 (39.9%)	152 (32.9%)
Number of A's	51 (29.5%)	179 (38.7%)
Total C and Above	104 (60.1%)	310 (67.1%)

The addition of the peer review may have had an effect on the percentage of students withdrawing from the Office courses. The drop in the percentage of withdrawals from courses between 2006 (M = 27.32%, SD = 14.861) and 2009 (M = 11.08, SD = 4.497) was significant, $t(17) = 3.447$, $p = .003$. Unfortunately, the increase in the percentage of students receiving an F in these courses between 2006 (M = 1.75, SD = 1.282) and 2009 (M = 6.64, SD = 4.433) was also significant, $t(17) = -3.006$, $p = .008$. As there was no significant change between 2006 and 2009 in the combined total percentage of W and F grades, it is tempting to make the observation that students who may have dropped in 2006 opted to continue their enrollment in 2009 but may have ended up failing. This apparent swapping between F and W grades bears further study. There was no significant difference in the percentage of students receiving grades less than C and C or greater between 2006 and 2009, nor in the percentage of students receiving an A in the courses.

Conclusion

The conversion of courses teaching the Microsoft Office applications to a project basis seems to be successful with the majority of students taking the courses. Two-thirds of students complete the courses with a grade of at least a C, and the percentage is steadily increasing. The addition of a peer review to the courses has been accepted with enthusiasm by the broad majority of students and seems to fulfill its purpose of stimulating self-reflection by allowing students to apply their mental energies to evaluation rather than application. The peer review may be one reason why the number of students withdrawing from the courses has decreased significantly. Further work is needed to find ways to ensure that those students who persist in the courses have an even greater opportunity to succeed.

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Using Virtualization to aid Student Learning in Traditional, Hybrid, and On-line courses

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Abstract

Providing students with productive hands on lab time is vital to the learners' progress and mastery of the course material. In stark contrast to the learners needs, schools are operating in economic times that are forcing computer labs to be reassigned and access to them limited. For example, Brevard Community College is operating on a four day work week. This cost cutting measure places limits on student access to campus computer labs that are vital to the success in computer courses.

To address budget constrains as well as ever changing student demographics, it is imperative that students utilize innovative tools to practice outside the traditional lab setting. Supplying students with virtualization software that emulates the classroom setting has enabled students to gain experience outside the physical classroom environment. Brevard Community College currently utilizes various virtualization software packages to enable traditional, hybrid, and online delivery methods while providing students with the best learning environment possible.

This intended audience for virtualization is currently students enrolled in operating systems courses, computer networking and security courses, as well as PC repair. The availability of open source and free virtualization software coupled with open source operating systems and academic licensing allows this technology to be deployed at a minimal cost to the students and the institution. This presentation will outline different methods for successfully using virtualization software in traditional, hybrid, and online courses.

Introduction

At Brevard Community College (BCC) there is a desire to provide lifelong learning opportunities to a diverse student population. In the Computer Information Technologies Department, we have a long tradition of providing traditional, hands-on education in many computer areas. The growing popularity of more flexible delivery methods intermingled with challenging economic and funding crunches has caused traditional, lab intensive courses to be delivered either hybrid or 100% online. But, a challenge has arisen. The ACM has just released its update to the IT Computing Curricula and it strongly encourages the incorporation of hands-on learning activities to reinforce theory and methodology (Lunt, Ekstrom et al. 2008). This paper will address the challenges to providing uniform, quality hands-on education in all three delivery methods.

Traditional Classroom

The traditional classroom is defined as students being required to physically attend a lecture/lab session for a given period of time throughout a semester. At BCC, we are fortunate to have IT

courses delivered in a fully equipped computer lab. It has been suggested in the literature (Chu 1999; Leitner and Cane 2005) that simply attending class will not provide enough practice for mastery of a given material. A problem that arose at BCC in multipurpose labs was if a student created and saved their work on a lab machine, there was no guarantee that the machine they were working on would be available after class. Other lab machines may be available, but their data is not there. To enable portability, a student can work in a Virtual Machine (VM) and save the entire session. Later, at any lab computer, the VM can be restored and work continued.

Hybrid Classroom

The hybrid classroom was created to enable more creative course scheduling. A hybrid course is one where a student must attend at least half of the traditional course time in class per week and spend the remaining time engaged in discussions outside the classroom. At BCC we are able to successfully deliver two night classes for students on one night, in a back-to-back manor. This allows for students to only make one physical trip to the college but gather information for two courses. The disadvantage of this scheduling is a limitation on the amount of hands-on time spent in the lab. VMs can be used by the students to practice in an identical environment – the same one that was demonstrated in the classroom. Here, the students have two choices; 1) save their VM in the lab and bring it home, or 2) simply recreate the lab environment at home in a VM of their choosing. In either method, the learner is able to spend more time with the material.

Online Classroom

Online classes are seeing a dramatic increase in enrollment at BCC. There are various reasons for this growth, but the fact remains that the quality of course is the same as the previous two delivery methods. To address the recommendations of the ACM (Lunt, Ekstrom et al. 2008), VMs were the solution to enabling students to participate in hands-on labs. VMs are a solution to this problem. VMs not only allow the student to experiment with the course material in a manner that will not damage their host system, but the professor can exercise far greater control over VMs to enable a cohesive experience across all learners. VMs simplify any troubleshooting problems that can arise with the students or translations issues that occur between students using different operating systems.

Virtual Machines - What are They?

Virtualization technology has seen recent industry wide adaption as a viable testing platform and server consolidation tool. Simply stated, a single host computer can support multiple virtual machines. Every VM is contained within its own 'sandbox' that does not allow for cross contamination from the VMs to the host or from VM to VM. The host and VM function as if they are the only computer running on that hardware. To the student, this means that all applications need to be installed separately on each VM. Moreover, problems in one VM do not adversely affect other VMs – including viruses and system crashes.

Flexibility with the security of host systems is another key reason for virtualization deployment in lab settings. BCC, like many other institutions, have lab computers that do not allow students to install software. To get around this security setting, all lab computers have Microsoft Virtual PC (Microsoft 2009) installed on them. This will allow a student to use an existing VM and con-

tinue work from a previous class meeting; allowing admin privileges on the VM for software installation or any other admin related task.

There are many different VM solutions that are widely available for student use at home or in the classroom. Please see Appendix A for a listing of VM manufactures and suggested scenarios for usage. The first step in using Virtual Machines is to install the VM software on the host system. This procedure is the same as installing any other type of software on the host system. Once installed, the user is free to begin creating new VMs for usage. Figure 1 is a common representation for the relationship of VMs to the host operating system and Figure 2 displays a Microsoft XP host system running a Microsoft Vista VM using Microsoft's Virtual PC and a Microsoft Vista host and an Ubuntu VM in VirtualBox.

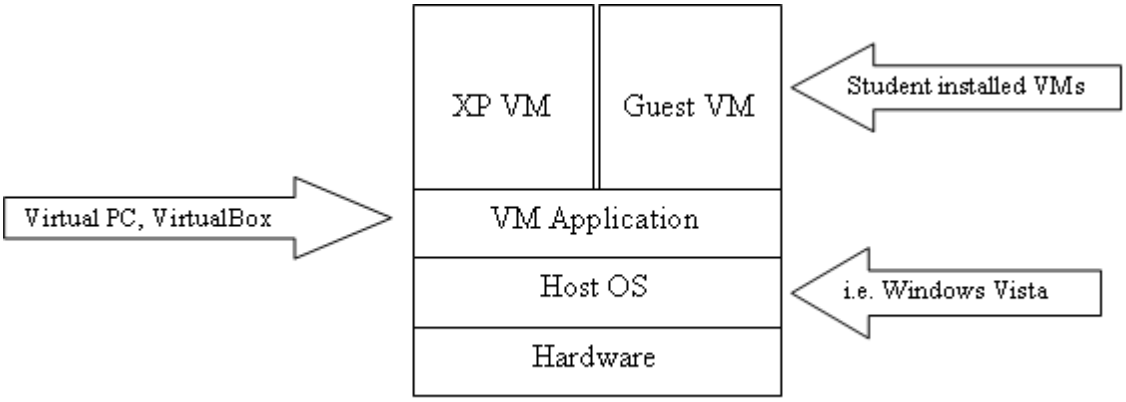

Figure 1. Relationship of PC hardware, host OS, VM application, and guest VMs.

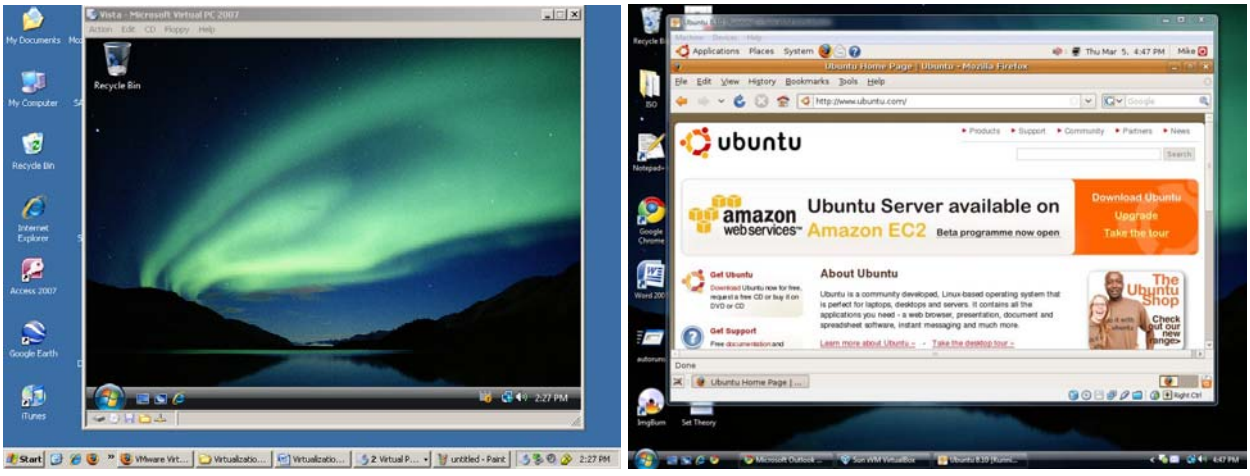

Figure 2. XP host with a VM running Vista and a Vista host with a Linux VM.

How do Students use VMs in a Traditional Classroom setting?

We started using VMs about 5 years ago in most OS classes when removable hard drives became economically difficult to justify. We needed a way that allowed students the freedom to install

their own OS (Windows XP or Windows 2003 Server) and have administrative privileges on them. Also, the installs needed to be pervasive throughout the term. As the technology matured, VM were deployed in Security, Cisco, and Linux courses.

The benefits of VMs in the traditional classroom are easily realized by the increase in direct student participation with the material. An added benefit to the instructor is the ability to have 'spare' VMs that students can simply copy if a catastrophic situation arises. Using this spare copy VM, a student that corrupts their VM can be back up and running in 5 minutes, no need to re-install the OS.

Students are also free to take their work home with them and continue with the content covered in the classroom. Most VMs are between one and three gigabytes in size and can be easily transported using a DVD-RW or USB jump drive. BCC has also partnered with Microsoft and purchased an academic license through the MSDN Academic Alliance (2009). This program allows computer science students' access to all of Microsoft's OS and developer software at no cost to the student. This eliminates any licensing issues that may limit use out of the classroom.

VMs in a Hybrid Course.

At BCC, hybrid courses meet approximately half the time as traditional courses. This allows for some very creative course offerings. For example, we have recently started offering two core classes in the CIT program back-to-back on the same evening. This way, students come to campus one night and can take two courses. With a shortened class time, out of class lab practice is very important. VMs enable just that.

During the class time, the instructor will discuss the course content and highlight the more difficult topics. For lab work, the students must VMs at their house or on campus labs. The benefit in a hybrid course is the instructor can provide guidance about using VMs. The goal is not to become an expert in VMs, but rather use the technology as a tool to better enable hands-on learning of the subject matter. Experience has shown, the amount of time the instructor can spend with the students working with them in a VM environment is directly related to their success using this technology.

How do you use VMs Online?

BCC is constantly examining new and creative delivery methods for computer courses. Currently, BCC offers 31 CIT courses online. But, we do not offer any of the OS or security courses. This places a limitation on the ability of students to successfully complete a CIT degree program entirely online. BCC is actively investigating the use of VMs to address the lab participation issue.

VMs are well suited for an online course delivery method. They provide all of the benefits associated with traditional and hybrid courses and allow for students to have a hands-on experience while accommodating a flexible delivery style. But, there are many technical challenges that need to be addressed before proceeding. Students need to have computer hardware that is capable of supporting the VM software (See Appendix B for more information). In the situation of Microsoft Virtual PC, the student host OS must support Virtual PC. The VM images are between 1-3 gigabytes in size. The diversity of students with various Internet connection speeds becomes an issue in making the images available. How does the instructor get a three gigabyte

file to every student? Student Internet connect speed now becomes an issue. Also, requiring students to install software opens up the institutions help desk to a wide array of new student issues and support calls.

Solutions to some of these problems have been investigated. Since Virtual PC will not install on XP Home or Vista Premium (Microsoft 2009), standardizing on VirtualBox could be used as it does not have such limitations and it can also be installed on Macs and Linux machines. To address the large file size, books could be packaged with a DVD that contains preconfigured VMs on them that will allow an initial seeding of the students' environment. Also, a course website could be maintained with the VM images on it. The one area that has not been successfully addressed is the increase in help desk calls that are related to VMs. Admittedly, this could be pushed back on the instructor. But online courses are taught exclusively by adjuncts at BCC and instructor availability for this additional role is in question.

Conclusion

Wide availability of free virtualization applications opens up a new lab delivery tool that actively engages student learners in the course content. In an environment of decreased lab availability and an increase in the need for hands on learning, virtual machines are a valuable addition to the technology instructor's toolkit.

Appendix A

Brief Critique of Virtual PC, VMware Server and Player, and VirtualBox

The three VMs software manufactures that I commonly use are Microsoft's Virtual PC, VMware's VMware Server and Player, and Sun's VirtualBox. All three offerings are basically the same with minor advanced differences that are not needed in our course offerings. The following is a brief overview of the advantages and disadvantages of all three products.

Microsoft's Virtual PC

Microsoft's Virtual PC is the easiest of the three for novices to the VM world. It is a free download from (Microsoft 2009). Virtual PC is a windows only application, so MAC and Linux host systems need to use one of the other two offerings. Virtual PC runs all windows operating systems, win95 to Win7, with ease. With the installation of VM drivers, which are included, the student can easily navigate between the VM and the host systems. The disadvantage is that many of the popular Linux distributions require modification to run. Virtual PC does not install on Vista Premium or XP Home.

VMware's VMware Server and Player

By far the most confusing and feature rich of the three VM products. VMware Server allows the student to create VMs on their own, VMWare Player does not. VMWare Server is designed to run in a client/server environment, which most students do not have. VMWare Player is a read only product that allows students to download a preconfigured VM and run it – no VM creation allowed. VMware Server and Player can be installed on Windows and Linux host systems. VMware Player excels in providing students ability to download preconfigured Virtual Appliances, of which there are currently over 900. VMware has another product that mirrors the functionality of Virtual PC called VMware Workstation, but currently it is not freely available.

Sun's VirtualBox

VirtualBox is currently the only open source project that I use. It runs on Windows, Macs, and Linux host systems. Its feature set is more advanced than Virtual PC's and allows for greater control over the VMs. I find that Linux VMs run very well on VirtualBox, as do Microsoft OSs. However, it is more complex than Virtual PC for VM novices.

Appendix B

Hardware requirements for running VMs

In my experience, I have found the following to be acceptable conditions for running a VM.
HARD DRIVE SPACE – at least 10 GB
CPU – Minimum – Intel Pentium 4 or AMD Athlon 64
RAM:
XP Host – 500 MB
    XP VM – 500MB (per VM used, so 2 XP VMs would require 1 GB of RAM)
    Vista VM 1 GB

Linux VM 500 GB
Vista Host – 1 GB
XP VM – 500 MB
Vista VM – 1 GB
Linux VM – 500 MM

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High Fidelity Simulation Use in an Undergraduate Nursing Program

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Introduction

Educational preparation of students in the 21st century must be accomplished within a changing educational delivery environment. This educational preparation of health care professionals, such as nurses, may take on an even more challenging role since the health care environment is also changing at a pace that is often difficult to keep up with. The availability of appropriate hospital-based clinical sites is diminishing, faculty shortages are projected to increase, and the need for additional nurses is increasing (Kovalsky & Swanson, 2004; O'Neil, 1998; Schoening, Sittner & Todd, 2006; American Association of Colleges of Nursing, 2007). These shifting dynamics pose challenges for faculty in meeting the educational needs of a diverse, non-traditional student nursing body and in preparing clinically competent health care professionals to meet the nation's demands (Jeffreys, 2007; O'Shea, 2003).

In addition the students that faculty face in the 21st century is more technologically savvy and need educational opportunities that blend traditional pedagogy with technologically advanced pedagogical principles. One method of technologically advanced pedagogy, high-fidelity simulation, can meet some of these challenges in preparing undergraduate nursing students.

What is High-Fidelity Simulation?

Simulation is the artificial replication of the real world situation in which students or individuals work in order to gain knowledge and psychomotor skills to be able to critically think through complex scenarios in a safe and non-threatening environment (Gaba, 2001; Medley & Horne, 2005; Hovancsek, 2007). Well constructed simulation has many of the needed clinical aspects that a student can become immersed in so that when the clinical situation is presented in a real-life situation, the student may be more prepared to handle the decision-making process and implement higher level care. Simulation is "an approach to experiential learning and is a 'learner-

centric' educational method, which integrates the cognitive, psychomotor, and affective domains in a non-threatening and safe environment (Lamb, 2007, p.34).

Simulation has been used in nursing at various fidelity levels for more than twenty years (Gaba, 2001; Bezyack, 2007, Hovancsek, 2007). Fidelity ranges on a continuum from low to high fidelity. Low fidelity simulation refers to the use of strategies such as basic written case studies, role playing, and administration of injections using partial task trainers (Bezyack, 2007, Hovancsek, 2007). According to Bezyack (2007) medium fidelity simulation involves the use of more realism but without the automatic cues such as the rise of the chest on inspiration or pupillary constriction from an administered medication needed for complete realism. High fidelity simulation provides the most realistic simulated experience with a mannequin that is computer-based and driven by pre-defined software derived scenarios or faculty-driven direct control such as the SimMan or Sim Baby from Laerdal.

So, what is high-fidelity simulation? It is a from of experiential learning that is learner-centered, integrating cognitive, psychomotor, and affective domains of learning through the use of SimMan or SimBaby in the High-Fidelity Simulation Center.

Historical Context

Simulation use is not something new. Simulation in nursing began with the use of low-tech task trainers such as Mrs. Chase in the 1950's followed by Harvey Cardiology Patient Simulator (Hudson-Carlton & Worrell-Carlton, 2005; Nehring, Lashley, & Ellis, 2002; Schoening, Sittner & Todd, 2006). The use of more cost effective high fidelity simulations in nursing has only been available since the year 2000 (Gaba, 2001).

Simulation has been used in the training of professionals in settings such as aviation, armed services, maritime industries, and medicine since the 1930's but more focus has been placed on simulation over the last 30 years (Gaba, 2004; Hudson-Carlton & Worrell-Carlton, 2005; Lupien & George-Gay, 2001; Nehring, Lashley, & Ellis, 2002). There has been an evolution of high fidelity simulators starting with Sim One development by the Sierra Engineering Company in the late 1960's for use in anesthesiology (Gaba, 2001; Nehring, Lashley, & Ellis, 2002). As Gaba (2001) points out the model faded away since faculty did not have a good grasp of simulation technology and potential use in the preparation of health care professionals.

The 1980's and 1990's ushered in more advanced simulation models such as the Gainesville Anesthesia Simulator (GAS) and the Medical Educational Technologies, Inc (METI) human patient simulator (Gaba, 2001). Laerdal, from Stagner, Norway developed SimMan in 2000 followed by VitalSim released a few years later. These high-fidelity mannequins are generally set up in an environment that is as reality based as possible. In addition to the setting there are numerous audio-visual and technological components that go into the creation of a simulated clinical experience for the student to engage in.

Creation of the High-Fidelity Simulation Center

The team at the College of Staten Island set out to visit several different simulation centers in the north east. Collaborating with personnel in the centers and then returning to the CSI campus we began to develop the center that is now in operation. Through careful planning, acquisition of

resources and space, and funding for equipment purchases and part-time support staff salaries, a simulation environment was created. Known as the Nursing Technology Neighborhood, the project began ten years ago as a multi-faceted nursing resource center for student nurses (Jeffreys, 2004; Steefel, 2008). The Nursing Skills Laboratory had traditionally supported the students' acquisition of cognitive and clinical skills through low to moderate fidelity simulation capabilities (Childs & Sepples, 2006; Terman, 2007).

The Video Simulation Center (VSC) was opened in the spring of 2007 to service a student body of approximately 350 per semester through the use of simulation with hand-held or tripod videotaping for student self-assessment of skills and evaluation of clinical decision-making performance. As a result of student and faculty evaluations of the pilot project phase-in and through a generous donation of one of the boroughs leading senators we were able to create a simulation center with a two-bedded patient room, observation area where the computers, monitors, hard drive, and audio-visual equipment is contained, and a debriefing room which is set-up as a Smart Classroom where video streaming of live or taped simulated clinical scenarios are viewed.

State-of-the-Art Audio-Visual Technology

After close collaboration between the Nursing department, the Office of Technology Systems, and Library Media Services, the High-Fidelity Simulation Center was equipped with state-of-the-art technology, including two patient simulators and a simulation capture system. We installed the Laerdal Advanced Video System (AVS) to serve as a foundation for all of the audio-visual systems. In order to capture all the activities involved in a student simulation, two remotely controlled cameras record the interaction between students, faculty, and patient simulators. Similarly, a simultaneous recording of all audio and patient monitor activity provides a detailed account of the simulated clinical scenario. Faculty and technicians can operate the AVS from a control room, not seen by the students, and technical staff pre-programmed the camera and other equipment settings to provide a user-friendly environment. Faculty and students can review and debrief previously recorded sessions that have been stored on a digital file server.

All simulations, whether live or recorded, can be viewed in an adjacent Smart Classroom that is equipped with a dedicated computer, projector, and audio link, all of which are connected to the AVS, allowing full interactivity between the two facilities.

Application in Undergraduate Nursing Program

The High-Fidelity Simulation Center (HFSC) was opened in fall 2008 with nursing courses and selected simulated clinical experiences phased in. Careful attention to setting the stage for students and faculty for an experience in the use of high fidelity simulation was considered. Faculty meets students in the HFSC for one clinical day mid way through their semester. An introduction to simulation, general overview, and objectives for the simulated clinical experience (SCE) is shared with the students. They then listen to an oral report for their patient, and then individually enter the HFSC to engage in the videotaped SCE. After the activity the students write nursing diagnoses, a care plan, and a nurse's note. When all students completed the activity, the videotaped vignettes of each student are reviewed as a group. Debriefing follows and students engaged in open dialogue concerning their performance. A reflection followed the debriefing where key questions are used to facilitate affective and cognitive thought. Debriefing and group discussion provided feedback to facilitate adult learning (Jeffries & Rogers, 2008; Sacdeva, 1996).

Questionnaires for faculty and students are designed and used to assess aspects of the simulations that might need improvement how participants feel about the experience. Responses on the questionnaires are overwhelmingly positive with over 90% of participants rating the experience as excellent. As a result of the SCE, subsequent skills practices are observed to be better in those students that participated in the simulations relative to those students that use standard skills practices.

Lessons Learned and Future Paths

The team at the College of Staten Island has embarked on an exciting pathway in the world of high-fidelity simulation through the use of technologically advanced pedagogical principles. There are lessons to be learned from both the creation and subsequent use of the center. Open communications made the creation of the center seamless. Collaboration between all involved departments provided the key to the design, development, and implementation of the project. As we continue to use the center we have already begun to realize the need for expansion since all levels of the nursing department are looking towards including the facilities into their particular curriculums. In addition we are discussing possible ways for the center to be used with the community in mind possibly through the use of the 'patients' in situations that might occur in the home where first aid and resuscitation methods can be taught. The future is bright and full of possibilities for the use of this high-fidelity technologically based center for faculty, students, and community.

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The Ethical Application of Technology in Student Decision-Making

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Abstract

The authors review studies of academic dishonesty at the undergraduate and graduate levels. They discuss the applicability of the studies' results and conclusions in order to promote strategies to reduce cheating throughout the higher education curricula. In particular, they suggest interventions to increase ethical decision-making in and outside the classroom in technology and composition classes.

Review of Literature

Studies indicate that academic dishonesty has increased among high school, undergraduate, and graduate students during the last forty years. A meta-analysis of educational research shows "a mean prevalence at 70% among college students" (Lambert et al. 3). The Carnegie Council on Policy Studies in Higher Education reports an increase in cheating from 4.5% to 9.8% at research universities from 1969 to 1976 (Kibler 255). The dishonesty also extends to post graduate study. Research published in the Journal for Medical Education in 1980 correlates cheating in medical schools with cheating in patient clinical care by young doctors (Kibler 256). The trend toward dishonesty has been exacerbated by competition for scholarships, financial aid, and acceptance at elite institutions, particularly medical and law schools. Moreover, the ubiquity of Internet use unquestionably facilitates plagiarism, often of entire assignments, the incorrect documentation of sources, and the indiscriminate use of suspect websites. Educational research must continue to investigate the incidence of cheating, its causes, and possible strategies to detect and discourage it. Equally important, research must define the roles university administrators and faculty play in devising and enforcing policies that promote ethical decision making among students at all educational levels.

Studies have not defined the term "academic honesty" in consistent, cross-referential ways so that results and conclusions can be more definitive and easier to compare among institutions studied (Wotring 2; Gardener 545; Lambert 12). "Cheating" may be defined as plagiarism or span a list of twenty-two specific behaviors that range from text messaging during a test to improper

documentation on a research paper. Lambert states that "academic dishonesty encompasses a wide range of behaviors that clearly cannot be assessed with a single measure" (12). Furthermore, the methodology of educational research is often debated. Studies usually measure "cheating" through anonymous, self-selected, institutional surveys which Generaux argues fails to reflect the complexity or breadth of the problem. These studies are undermined by the inherent bias of using self-selection (701). Also complicating the collation of results are researchers' choices of bivariate or multivariate analyses. Lambert claims that the results of bivariate analyses do not always support the results of multivariate analyses (12). These diverse research modalities limit the conclusions educators can draw from the results.

Demographic differences between two and four year institutions, private and public, affect conclusive data as to the causes and predictability of cheating or the populations most representative of the phenomenon. Wotring asserts that research into cheating at community colleges is insufficient, inconclusive, and based on atypical demographics. She concludes that comparisons with four year schools are not reliable (3). Despite the urgency, she believes that research strategies have failed to adapt to the demographic diversity of the two year college or to concerns about the growing number of adult learners in the country. Researchers also disagree about the rate of cheating among "honors" versus non-honor students in college. Some attribute a "higher level of moral development" to the gifted and, consequently, predict less cheating among these students. Rittman contradicts this claim and insists that the competitiveness among honor students correlates with greater observed and reported cheating (4). The variables in research subjects, methodology, and institutional demographics reveal the absence of an integrated theory of academic dishonesty that can inform a shared, on-going analysis of the problem.

Universities and colleges do not have clear, consistently applied policies on academic honesty. Sanctions may not be enforced evenly by administrators. Some professors may be indifferent to imposing sanctions (Gehring, 1986, as reported by Kibler, 255). Lambert reports significant differences in faculty and administrative discipline of offenders regardless of official policy (13). When students sense institutional apathy and a lack of vigilance in implementation, Genereux concludes they engage in dishonest behaviors more frequently (688).

A new pedagogical paradigm also challenges perceptions of cheating among students. Faculty has traditionally graded students on the basis of individual effort and merit. The "millennial" generation of students, however, especially at the graduate level, is often graded on the basis of collaborative learning and teamwork. Wotring suggests that this contemporary cohort perceives honesty differently. Her study points to significant behavioral changes in male students who collaborated on assignments, when individual work was required (2). The practices of collaborative learning and shared evaluations may confuse students. 'Millennial students are predicted to have difficulty recognizing traditional operational definitions of academic honesty" (Wotring 5). Finally, as McCabe insists, the academic "culture of integrity" is suspect as a motivational factor in the work of students at most institutions surveyed (43). Even in schools with honor codes and counseling services for offenders, an increase in the admission of cheating did not reduce the rate of cheating (Gardner 543). High rate cheaters did not bother to attend scheduled counseling sessions, an indication that indifference to honesty is normal in a "success-oriented society which exalts individualism and dissent" (Gardner 554). The student culture of the twenty-first century deviates from previous decades. The 1960's and 70's saw a consensus among educators and administrators that the college experience should necessarily develop a student's integrity (Kib-

ler 254). The dishonesty in the business and commercial worlds today helps create the belief that ethics play a minor or irrelevant role in attaining academic and professional success.

Educators, therefore, have to confront inconclusive, inconsistent data, faculty and institutional indifference, and student cynicism about academic honesty. Their concerns are aggravated by studies that reveal that taking a course in ethics does not affect the frequency of cheating. Some professors ignore cheating altogether. Tabachnik estimates some 20% of faculty fails to take any action (507). Other research reports that cheating remains high despite punishment for cheating, non-punishment, or incentives not to cheat. Students at non-honor code schools feel no more obligated to report cheating among peers than a school with no honor code. McCabe stresses that students feel it is the responsibility of the faculty and administrators to catch and punish offenders (40). This data, combined with ineffectual honor codes, the opportunistic nature of cheating behaviors, and research that fails to define predictable factors that induce cheating, can easily discourage faculty from pursuing policies in their classroom that promote ethical decision making.

Many educators, however, believe that cheating threatens the foundations of academic discourse and the development of future professionals. Some feel rampant dishonesty threatens the role of universities in society. In 1999, the Center for Academic Integrity at Duke University announced that "raising student integrity should become of academia's highest priorities." Some studies point to the role of the professor in the classroom as the "firewall" against the further erosion of integrity. Indeed, as Gardner confirms, the professor's "treatment contingencies altered the rate of admission of cheating" (547). Thus, a professor should ideally allow opportunities for a discussion of ethics in the classroom and provide incentives for moral decision making.

Strategies for Reducing Cheating

In general, faculty can adopt measures to monitor cheating in their classrooms. They can use multiple versions of tests, assign seats during examinations, control the use of electronic devices, and rely on turnitin.com to discourage plagiarism. They can enlist students in the development of a class honor code and advocate peer reporting of offenders. While peer reporting of offenders has had limited success, many educators believe that empowering students to be accountable to their peers has a far greater effect than the vigilance of faculty scanning the test room for cheating (McCabe 40). Certainly, faculty should try to act in concert with administrators and institutional policy. Kibler urges classroom procedures that provide discussion, dialogue, and role play of ethical dilemmas in advance of testing and evaluation (263). At the very least, faculty can introduce the student handbook to a class and review policies and sanctions for cheating. However, a more important goal should be to develop an appreciation for ethical decision-making, rather than a focus on punitive or threatening measures to control cheating behaviors.

Students have mastered many forms of technology; they sometimes use these technologies dishonestly. There may also be ignorance as to how to use technology honestly. In this light, students may benefit from a discussion of ethics in technology courses themselves. At Purdue University College of Technology Columbus, the authors reviewed the ethical issues germane to intellectual property, software licensing, software piracy, trademarks, patents, and copyrights as well as privacy issues, compliance with standardized codes, plagiarism, security, computer abuse, identity theft, spamming, chain letters, and netiquette. The authors chose two computer and information technology courses, CNIT 107, Computer Software, and CNIT 136, Introduc-

tion to Computer Technology and Applications. In both classes, more than one hour of class time was devoted to a discussion of information technology and intellectual property issues. Students were encouraged to use a variety of online technologies, such as Wheel of Terms, Practice Test, Quiz Yourself, Track and Field, Crossword Puzzle, Computer Genius, and Case Studies to enhance understanding of ethical issues. Using these technologies, students were able to learn more about ethics in an entertaining way by playing a computer game called "Wheel of Terms." This CNIT 107 class was also presented with a detailed demonstration of how turnintin.com works.

The students in both classes later took a test on ethical decision making, and were asked to write an article review on the topic of "Nanotechnology." The results were studied and the authors found that students in both classes did very well in article review compared to the article review of similar topics in other classes.

Turnitin.com helps faculty control plagiarism. However, it also allows students to comprehend the concept of originality and intellectual property rights. From an English professor's point of view, it helps students develop one of the most important skills in their academic lives: paraphrasing. Turnitin.com promotes Stage III of the writing process: revision and editing. It allows students to self-correct and acknowledge the proper role and use of sources in their writing. It often leads to real understanding of the definition of writing: thinking. At Miami Dade College, the authors display a sample page with student "writing" and undocumented sources. Students are frequently shocked to be presented with evidence that copying is not only unethical, but that it endangers the students' preparation for a career. When they copy, no learning has taken place.

Most educators acknowledge that students have trouble managing their time in and out of class. Moreover, since so many classrooms are now fully computerized, students often use computers inappropriately in class by surfing the Internet, checking email, instant messaging, and playing computer games. This tendency further compromises the learning process and time management of students. At Purdue University College of Technology at Columbus, the authors use NetSupport School to limit the misuse of time in the classroom and in the laboratory. NetSupport School allows instructors to take control of students' computers by transmitting instructors' screens to all the computers in the classroom. If in the lab, instructors can individually select student monitors and transfer the screen to the instructor's Instructors can view a large number of student screens simultaneously and, if necessary, fix a mouse pointer over a specific student's thumbnail in order to enlarge the view of that computer automatically. While NetSchool Support may seem intrusive, it is a useful tool for non-traditional students and older learners. Faculty has the ability to interact continuously with a student and intervene not only in the case of inappropriate behaviors, but also to give academic support and encouragement.

Finally, the authors believe ethical decision making is contingent upon having the appropriate knowledge base. Students today use Internet sources indiscriminately. They must be taught to distinguish between scholarly web sites and websites that convey information that is biased, prejudiced, incendiary, inaccurate, and baseless. The authors have found it useful to introduce technologies such as Wiki, blogs, and web sites of special interest groups to help students weigh the usefulness and appropriateness of the information.

"A wiki is a collection of Web pages designed to enable anyone who accesses it to contribute or modify content, using a simplified markup language. Wikis are often used to create collaborative

websites and to power community websites." (Wiki). At Purdue University College of Technology at Columbus the authors encourage students to use this technology to learn more about ethics. This allowed students to interact and discuss with Internet users about ethics.

The authors concluded that a discussion of ethical decision making should be introduced in technology and composition classes and continue throughout the undergraduate experience. Such a discussion enhances student learning and protects society. It also helps students understand ethics from a cross-cultural and global perspective. Ultimately, such a dialogue within the classroom might extend to greater collaboration between faculty and administrators to promote consistent policies to monitor and reduce the incidence of student cheating.

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Mobotix Surveillance Cameras Using Technology For Campus Safety

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Abstract:

Campus security is becoming an increasingly important area, and technology is playing an important role. This session will demonstrate the networked Mobotix surveillance camera system, and some ways it is being utilized at Sweet Briar College. The sophisticated Mobotix software enables extremely customized event recording, along with high-resolution results. We'll show how easy it is to access your video feed from remote locations, and will demonstrate a variety of features including: temperature monitoring, audio settings, alarm notifications, text & display settings and a variety of different event settings. Practical applications of this system include: Safeguarding equipment from theft or damage, providing increased safety for students and allowing remote monitoring of various locations without the need for additional staff. So come join us for a glimpse at an inexpensive, yet effective security solution for your campus.

Background:

Why should our campus invest the money for security cameras? Cameras give us the ability to monitor activity in the areas they are installed. We can deter theft and damage to valuable equipment. Plus, we can give our students an additional layer of protection from various threats. It also allows academic computing and our security department to monitor more locations with less staff.

Why we chose the Mobotix brand of cameras:

In researching various security camera systems, we were unable to find any other cameras that even came close to the features offered by Mobotix in the same price range. They had extremely appealing features in both the actual hardware of the cameras, and the various software interfaces that manage them. We also realized that the system could expand easily to meet our current and future needs.

Hardware

These cameras can all operate through your existing campus network. They have built-in microphones, speakers and temperature gauges. They also have internal flash memory that acts as a network buffer when recording to an external storage location. There are multiple hardware configurations available with different camera models… yet they all can be managed by the same software. All the cameras are weatherproof for indoor or outdoor mounting, and can operate without heating or ventilation in extreme temperature conditions of -30 to 60 degrees Celsius. Some hardware options include dual lenses, different focal lengths, day/night lenses, or even bullet-resistant casings.

The pricing for these cameras are relatively inexpensive and range about $650 to $1200 for most models (with the specialized vandalism proof model being around $3200). We are purchasing our Mobotix cameras through the distributor Anixter Incorporated (http://www.anixter.com).
The camera model that we are utilizing the most on our campus is the Allround M22, (shown in the illustration above) with the following technical specifications:

Technical Specifications Allround M22

Models	IT, IT-Night, Sec, Sec-Night, Sec-CSVario, Sec-R8
Lenses	22 to 135 mm format, horizontal angle 90° to 15°
Sensitivity	Color: 1 lux (t=1/60 s), 0,05 lux (t=1/1 s) B/W: 0,1 lux (t=1/60 s), 0,005 lux (t=1/1 s)
Sensor	1/2“ CMOS, progressive scan
Max. image resolution	Color: 2048 x 1536 (3MEGA), Black/White: 1280 x 960 (MEGA)

Image format	2048 x 1536, 1280 x 960, 1024 x 768, 800 x 600, 768 x 576 (D1), 704 x 576 (TV-PAL), 640 x 480,

	384 x 288, 352 x 288, 320 x 240, 160 x 120; free image format selection (e.g. 1000 x 200 for skyline)
Max. frame rate (M-JPEG) (Live/Recording)	VGA: 16 fps, TV-PAL: 12 fps, MEGA: 6 fps, 3MEGA: 4 fps
Max. Video stream (MxPEG) (Live/Recording/Audio)	VGA: 30 fps, TV-PAL: 24 fps, MEGA: 14 fps, 3MEGA: 10 fps
Image compression	MxPEG, M-JPEG, JPG, H.263 (Video-VoIP-Telephony)
Internal DVR	Internal Flash Recording 8 GB (optional)
External storage	Directly on NAS and PC/Server without additional recording software
Software (inclusive)	Video-Management-Software MxEasy, Control room software MxControlCenter
Image processing	Backlight compensation, automatic white balance, image distortion correction, video sensor (motion detection)
Virtual PTZ	Digital Pan/Tilt/Zoom, continuous 8x zoom
Alarm/Events	Triggering of events by integrated multiple-window motion detection, external signal, temperature sensor, notification over email, FTP, IP-Telephony (VoIP, SIP), visual/acoustic alarm Pre- and post-alarm images
Audio	Integrated microphone and speaker, lip-

	synchronous audio, two-way speaker, audio recording
Interfaces	Ethernet 10/100, USB
Audio/Telephony	VoIP, SIP, two-way speaker, remote controlling of the camera in- and outputs, event notification
Security	User-/Group management, HTTPS/SSL, IP address filter, IEEE 802.1x, Intrusion Detection
Certificates	BGV C9 (“UVV”), EMV (living environments, industry), EN 50155 (shock, vibration, temperature), CE, FCC
Power supply	Year-round Power over Ethernet (IEE 802.3af; Class 0), Netpower-Adapter, typ. 2,5 W
Operating conditions	IP65 (DIN EN 60529), -30° bis +60 °C (-22°F to +140°F)
Dimensions	WxDxL: 13,5 x 20 x 13 cm, Weight: ca. 600 g
Standard delivery	Weatherproof housing (reinforced composites - PBT-30GF), white, SecureFlex wall/ceiling mount with turn/tilt mount and concealed cabling, covers RJ45 wall outlets, incl. lens, Polycarbonate lens cover, spare lens cover, mounting parts, allen wrench, patch cable, manual, software

Software

The software that actually runs the hardware is what makes Mobotix truly special. Using the software, you can configure each camera for one of two main methods of recording:

a) Continuous – the camera will record continuously to your storage device. This is similar to how traditional security recording devices operate.

b) Event Scheduled – The camera will only record when certain pre-configured events trigger it. Possible types of events include motion in a certain area of the frame, noises that exceed a predetermined decibel level or even temperatures that exceed a certain range. You can even set the camera to record a certain amount of time before and after any event.

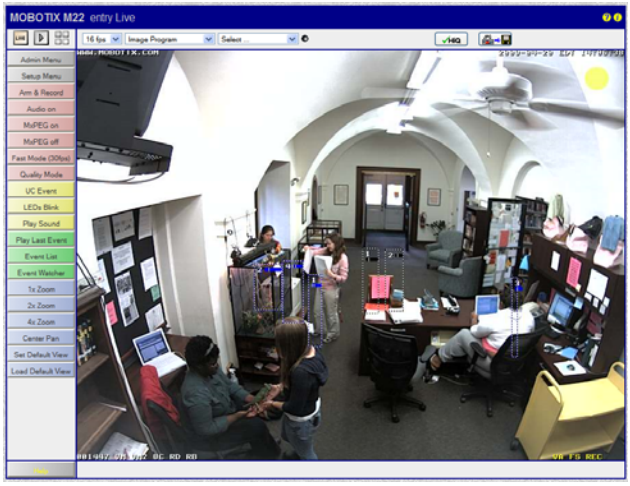
The advantage to event scheduled recording versus continuous recording is that it presents a much lower demand on your storage unit. It basically only records data when something is worth recording. Plus, you have less footage to review when you need to examine your recording.
In addition to the different recording methods, there are also many software-driven methods to actually improve the footage that is recorded. Exposure zones can be created so that the main area of the frame that you are most interested in recording always has the proper exposure settings (brightness, contrast, color, etc…) regardless of what conditions exist in the other areas of the frame.

Other items that can be configured and controlled through the software include

- The image format and resolution
- Frame Rate
- VoIP

There are three main ways to interface with the software:

a) You can connect directly to individual cameras through an IP connection.



b) You can utilize the Mobotix MxEasy software to manage up to 16 cameras simultaneously.

c) You can utilize the Mobotix MxControl Center software to manage as many cameras as your computer's processor can handle (a Pentium IV/3.2 GHz could support 30 video feeds delivering 25 fps including audio).

During our presentation, we will attempt to demonstrate each of these interfaces.

How we've implemented Mobotix cameras on our campus:

We've installed approximately a dozen cameras for our computer labs, the library, gym, and our main entrance. Our cameras are configured to save their event recordings directly to a network share on a Drobo storage device. Our Drobo has 4 1-terabyte drives, which utilizes BeyondRaid storage technology to provide approximately 2.7GB of redundant disk storage. The Drobo allows for easy storage expansion by just swapping the 1-terabyte drives for larger ones as necessary.

The Drobo is simple to operate, doesn't require an operating system and provides excellent reliability… all with the hassles of traditional server-based storage systems. The cost for a Drobo, Drobo Share, and 4 1-terabyte drives is only around $1100.

Additional Plans for the Future:

We will assess additional areas on campus to determine where additional cameras would be most useful. Where necessary, additional cameras can be purchased and placed in position. Once configured, they will seamlessly integrate with all the other cameras already in place. If necessary, we can also expand the Drobo storage device to utilize larger drives.

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Technology and General Education: Integration, Facilitation, and Assessment

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Abstract:

The University of Saint Francis launched a new general education curriculum in the fall of 2007. One of the curriculum's eight goals is for students to "Demonstrate competence in applying current and emerging technologies." This presentation discusses how the university identified these competencies for both general education and individual disciplines. Next the presentation will show how the university assesses students' ability to meet the outcomes of our curriculum by utilizing assessment tools designed by the university for general education assessment. This presentation will also describe the process that faculty and technology specialists engaged to develop this component of the general education curriculum and its assessment. The presenter will share USF's model for integrating technology throughout the curriculum and assessing that integration. Participants will be able to contextualize this process for their institutions through the interactive presentation

Note: The author was not able to submit this paper before the Proceedings went to print. He will provide copies or a link to a website where the paper may be accessed at the conference.

Teaching Using Small Group Activities: Assessment of a 10 year Experiment

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Abstract

In 1992, I began teaching all my math and computer science courses by having students read the material before class and engaging them in enrichment activities in small groups during class. I continued with this "guide on the side, not sage on the stage" process until I retired in 2002. In this paper I will describe my experience and assess its effectiveness against my teaching over the preceding 30 years. The paper will include explanations of how to engage in this type of teaching and references for those who wish to try it out. The presentation will model this teaching philosophy, so those who plan to attend should have read the paper in the proceedings before the session.

Introduction

In the summer of 1992, having completed my 30th year of teaching Math and Computer Science in a traditional way by lecturing and answering questions, I attended a summer institute sponsored by Pacific Crest. During the 4 day institute, I learned about the philosophy of process education and practiced teaching using small groups of students working on guided-discovery activities, I heard faculty at the institute object vehemently to the effectiveness of this type of teaching and witnessed the facilitator, the President of Pacific Crest Corporation, vilified for suggesting that students would learn better using this "guide on the side" approach than they ever could using the traditional "sage on the stage" way of teaching. However, I could see the efficacy of process education. The next semester, I converted all my courses to reduce the amount of time spent in lecturing and increase greatly the time students worked in teams on activities.

Although it was rough in the beginning and my student evaluations were terrible, I went back to another institute the next summer and discovered what I was doing wrong. Things improved steadily from that point and I continued to use the process education approach with my teaching until I retired in 2002. In this paper I will describe this approach and how it generated much better results than what I had tried to do before 1992. I will also describe how my scholarship both before and after my retirement has been influenced by my experience with process education.

Process Education

According to (Beyerlein, 2008), process education is an educational philosophy, driven by studies of performance, that emphasizes continuous development of learning skills, the use of assessment principles, and mentoring to produce self-growth. There are several overriding principles governing the successful application of the philosophy:

Principles governing faculty performance:

1. Faculty must fully accept responsibility for facilitating student success.
2. In a quality learning environment, facilitators of learning (teachers) focus on improving specific learning skills through timely, appropriate, and constructive interventions.
3. Mentors use specific methodologies that model the steps or activities they expect to use in achieving their own learning goals.
4. A Process Educator can continuously improve the concepts, processes, and tools used in their work by doing active observation and research in the classroom,

Principles governing student performance:

1. Every learner can learn better, regardless of current level of achievement; one's potential is not limited by current ability.
2. Although everyone requires help with learning at times, the goal is to become a capable, self-sufficient, life-long learner.
3. An empowered learner is one who uses learning processes and self-assessment to improve future performance.
4. To develop expertise in a discipline, a learner must develop a specific knowledge base in the field, but also acquire generic, life-long learning skills that relate to all disciplines. (PE Conference, 2007)

Teaching Experience

What attracted me most to process education was its emphasis on my responsibility for student learning and the insistence that every student can succeed. I was fed up with observing the better students succeeding in my courses and the weaker students failing to learn. Many of my colleagues blamed this phenomenon on the students and their work ethic and did not take any responsibility for the results. I found that when students work in small groups, with at least one superior student, one weak student and the rest average students in each group, everyone learns better. The superior students achieve a greater understanding by explaining concepts to the others, the weak students are encouraged by the smallness of the group to ask questions that would not occur to the others, thus helping explicate the material on a deeper level. The average students are forced to interact with their peers and take on roles that they would never experience in a traditional classroom. It was true that the superior students rebel at first when confronted with this process. They would claim that I was being paid to teach (i.e. lecture) to them. My answer was always a question: "Are you learning?" After a while they had to admit that they were.

In my courses the first year I ignored some of the basic principles of process education. I did not pay attention to helping the students improve their learning skills; the discovery activities focused on the content of the course exclusively. I did no assessment and did not insist that the students do any self-assessment either. As a result, a number of students simply blew off the activities. I did not assign grades for the quality of their work. It is little surprise that the early attempts were doomed to fail. After I learned the importance of assessment – one member of each team played the reflector role and had to report the strengths, areas for improvement, and insights about their work together several times during each class, and I would collect these reports at the end of class. I insisted that each team assign themselves a grade on their performance at the end of each class. If I agreed with the grade, I would double it; if not, I would let it stand. I insisted that each student keep a learning journal where they would assess their own performance after each class. I would collect these journals several times during the semester and assess randomly chosen entries.

Instead of intervening when a team was struggling with the material during class, I would try to discover what learning skills they needed to improve in order to improve their ability to understand and process the material, Under the philosophy of process education, students can always learn the course content if they have improved their learning skills enough. At the start of each semester, I spend a few classes assessing important learning skills and helping the teams develop these skills. I would emphasize that I am obsessed with learning and the goal of the class, no matter what the subject matter, is to help them improve their skills. Teamwork skills are also very important in today's work environment. I had a number of students write to me after graduation saying how well they were prepared to work in teams in their jobs. By using the learning of the content of the course as a means to improve learning skills, I helped students learn both content and process.

I never grew comfortable with this type of teaching. I found myself wondering whether I, in fact, was cheating students by not explaining everything to them – by forcing them to read the material in the textbook before class and then wrestle with problems requiring information from the reading during the class. I tried never to answer a question unless it was with another question while students were working on activities. I did set aside a period at the start of class to allow them to ask me consulting questions before I gave a quiz on the reading material. These were group quizzes and received a grade. Thus, in each class the team had a quiz grade and a class grade. My classes were very different from what the students were used to, but they often would try to convince my colleagues to conduct class the way I did. That sometimes let to strained relations, exacerbating my discomfort.

All in all, I am happy that I persisted. It is my belief that all students do learn better using these principles, and a little discomfort on my part led to big payoffs for the students. Another positive effect of this effort was the improvement of my scholarly work.

Scholarly Work

Over the last ten years, especially since I retired from teaching, I have devoted much of my scholarly writing to developing the theory and practice of process education. I wrote a paper on a process education approach to teaching Computer Science for ASCUE (Smith,1996). I became one of the original editors for the Faculty Guidebook (Beyerlein, 2008), focusing on the Learner Performance area of facilitation and building a quality learning environment. In this role, I have written 12 of the modules (chapters) in this guidebook, and mentored other faculty authors in writing 9 other modules. It has helped me keep involved in academic life without going back to the classroom. At this point, I am so far removed from day-to-day classroom activities that I can no longer effectively write more modules. This paper is my swan song in that regard. However, I can still serve in a supporting role. I put together the proceedings for ASCUE and have taken over administration of the peer-review track for this conference. I am treasurer of the Academy of Process Educators, and webmaster of other organizations.

Conclusion

This paper has rambled somewhat, but I hope I have interested you in process education. If you wish to learn more about this philosophy of education, I encourage you to join the Academy of Process Educators (Academy, 2009). This organization is designed to support those who are committed to helping students grow their learning skills and who are ready to take responsibility for student success. The dues are $50 per year and are included in the annual conference registration fee. This year's conference is at Gaston College in Charlotte, NC.

Another useful resource is the Faculty Guidebook I discussed above. That and other resources can be found on the Pacific Crest website (Pacific Crest, 2009). For anyone seriously considering adopting techniques developed to further the philosophy of process education in their teaching I would urge them to attend one of the teaching insti-

tutes sponsored by Pacific Crest. A calendar of events can be found on their website. Participation in any of these organizations may well revolutionize your teaching as it did mine.

Finally, I have several syllabi on my website (Peter, 2002) with links to the activities I used in my classes. You are welcome to use any of this material.

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Hybrid, It's More Than Fuel Efficient

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Abstract:

At last year's conference, we presented a paper on our first attempt at developing and delivering a hybrid course in our Computer and Information Technology department. The course we used was C&IT 107 Computers and Software Packages, an introductory class used as a service course on campus. In this paper, we will delve into the plans we have developed for implementing hybrid courses at our Columbus campus. We will show how the plan was developed after analyzing pre-tests and post-tests administered in the hybrid and traditional classes. We will discuss what changes need to be made to go from one course offering to a wider availability on campus.

Introduction

Last year we made our first attempt at developing a hybrid course in our Computer and Information Technology (C&IT) department. By hybrid class or blended as it is sometimes called we understand that much of the course learning is moved online which in turn makes it possible to reduce the time spent in the classroom. We differentiate between hybrid class and an online class where the face-to-face component is eliminated and also, traditional course that has added an online component without reducing the face-to-face time. We were interested in developing a hybrid course because of the potential benefits touted by proponents of hybrid classes including: reach new markets, less time for students to commute, allow students to complete degrees sooner, ability to accommodate additional students without need for additional classrooms, additional ways to engage students, and potential increased student learning.

For our Columbus C&IT program which has seen declining numbers in enrollment over the past six years like many Computer Science, Management Information Systems and Information Technology programs adding hybrid course is just another tool to allow us to compete for new students and to retain the students that we have by using new and innovative measures. Specifically, for our campus hybrid courses offer several benefits including: less student seat time which is beneficial as a commuter campus with more than half of the student population non-

traditional, also, hybrid courses would free up our computer labs which are at a premium in the evening, and finally hybrid offers the best of both worlds in providing the benefit of using technology to reduce seat time but also providing a means for students to still have the face-to-face time with instructors which we feel is important in technology courses.

Experience on Campus with Hybrid Courses

The past three semesters we have offered one section of our C&IT 107 Computers and Software Packages an introductory course in the basics of computers in the hybrid format. Typically, we offer approximately five sections of this course each semester. After the first semester as we chronicled in our paper from last year we surveyed the students from the hybrid class and found that almost nine out of ten students that enrolled in the hybrid class preferred it to online and traditional face-to-face class. Also, students seemed to like the variety of ways used to engage the students in the class from traditional face-to-face, to video and audio lectures, to discussion sessions.

Last fall we decided to see if there were any differences in learning in the classes. We were not able to get statistics from all of our C&IT 107 classes but we did do some pretest and posttest analysis of both traditional and hybrid courses. In the hybrid class, the scores were more tightly bunched around the mean in the post test than the pretest. In the traditional class, the scores were more tightly bunched around the mean in the pretest than the posttest. This gathering of the scores forms the bell curve. The standard deviation of the pretest for the hybrid class was 6.83. The standard deviation of the posttest for the hybrid class was 5.04. The standard deviation of the pretest for the traditional class was 4.64. The standard deviation of the posttest for the traditional class was 8.46. This statistics tell us that the makeup of the students in the hybrid class had more of the students scoring at one extreme or the other coming into the class, but the class as a whole moved to a more tightly bunched group by the end of the semester. The statistics tell us that the make-up of the students in the traditional class were relatively more tightly bunched as a group coming into the class. The traditional class had a relatively larger variation of the mean per student coming out of the class. The assumption we are making is that the hybrid class has a more consistent nature of learning for the students than the traditional class because the standard deviation margin was narrowed.

Based upon the student surveys, comments, research and findings from using the hybrid format in the C&IT 107 class we would like to continue to use the hybrid format and expand its use in our program and on our campus. We have talked with other faculty members on campus in other departments and feel there is a desire to utilize hybrid classes. People were interested but there were questions including: which classes it would be most effective in, how often should you meet, what content to place in the online component and what content should be placed in the face-to-face component, which technologies to use in the online component and also a need for training in some of the technologies? We had many questions and not all of the answers, so we decided to develop a plan and see if we could find support for it and hopefully financial resources to support it.

Initial Implementation Plan for Hybrid Education

The purpose of a hybrid education implementation plan is to provide a support system for faculty learning to use and implement distance education into their classes in attempt to adapt them in a

hybrid education format. Goals for faculty should be chronological in nature and advance by semester and technology availability. Ultimately the goal of the plan would be to create a hybrid education course(s) collection in an attempt to achieve many of the benefits listed previously.

The foundation of a hybrid education development plan should begin with a hybrid education development team. Each department or college (i.e. Computer and Information Technology or College of Technology) should have a hybrid education development team. The team members should consist of a team chair, the faculty in the department, the technical support person(s) assigned to the department, the library helpdesk person assigned to the department, and at least one subject matter expert faculty member. The responsibilities of each of these individuals would correspond as described in Table 1.

Table 1: Hybrid Education Development Team

Administrative Person(s)	Meets with the team to show administrative support and concern for the development of distance education. Responsible for facilitating and guiding monthly meetings. Also, they are responsible for allocating needed funds to support the technological development of the faculty.
Faculty	Should be active in the creation of the hybrid education development plan. Responsible for following the three semester hybrid education development plan. Also, they are responsible for voicing their needs in education development.
Technical Support Person(s)	Informs the team of the equipment and software available. Offers training sessions once a month to instruct faculty on the new hybrid education opportunities. Informs team of professional development opportunities in distance education outside of the three semester plan.
Library Helpdesk Person(s)	Must be well versed in distance education use and implementation into the classroom. Responsible for fielding questions about hybrid education, trouble shooting possible problems, and guiding faculty on software choices/applications for distance education.
Subject Matter Expert Faculty	Responsible for sharing ideas, providing examples of their own hybrid education courses, offering any suggestions, and guiding faculty to strengthen their areas of technological weakness. This individual may be the only individual capable or willing to take on the leadership responsibility of the team.

This team should serve as a guiding and motivating force behind the three semester hybrid education development plan. The team should meet the 4th Friday and last Friday of every semester to discuss any new hybrid education, successful application of hybrid education into the classroom, and concerns about or problems with the distance education/equipment. The team should be guided and facilitated by a team leader so as to keep the team on a positive track (i.e. no distance education bashing sessions).

The first meeting should serve as a kickoff type meeting. The team should review the goals for the current year's plan. Each cluster, like the Computer Information Technology department or College of Technology depending upon how teams are assigned should be assigned as a host to one meeting. They should present how they implemented distance education in their area. The

last meeting of the hybrid education team should review the milestones started and or completed in the past year, highlighting the goals achieved and setting upcoming goals.

The timeline for the three semester implementation of hybrid education calls for attending workshops, learning to use software and equipment, developing full length courses, team meetings and planning and developing, and faculty blogging. Two workshops should be required each semester. In the first semester of the plan, faculty would learn how to use e-mail effectively. Therefore, the in-house hybrid education workshop should be on e-mail software and using classroom groups. The other workshop, the faculty should be free to choose in their own area of interest relating to their department needs.

Faculty would need to learn course development software and a communication system (i.e. Blackboard, Podcasting, instant messaging, discussion board, etc) each semester. The new software may also involve learning about new equipment, like iPods. The course development software should help them to transform their traditional classes to hybrid education format. The communication system should allow them to talk with their team about the problems they may confront when learning a new piece of software/equipment.

Team meetings should help the faculty voice their concerns/problems with a technical assistant present. In theory, this technical person should have the answers to any problems that may seem impossible to solve to the faculty.

Team planning builds teamwork. Once a semester, each team would present how their team has implemented distance education - even if it is only the beginnings of the development.
Blogging is meant to assist the faculty throughout the three semester plan and then beyond. If faculty run into a problem and then find a solution and write about that in their blog, when they confront the problem again, they can search their blog for the answer.

Table 2: Semester One

Category	1st 8 weeks	2nd 8 weeks	Vacation
Workshops	In-house e-mail workshop Blog entry on the pros and cons of these workshops	In-house Blackboard workshop Blog entry on the pros and cons of these workshops	Blog entry on the pros and cons of semester one
Distance education	Learn to use e-mail communication software Learn to use a listserve or e-mail groups Communicate with your team on a listserv or e-mail group	Learn to use a discussion forum within Blackboard Communicate with your team on a discussion forum	Communicate with your team via email to update on summer activities
Course Development	Develop a one sample course using Blackboard Blog entry on the pros and cons of this software	Conduct the sample course with your team members as your students Blog entry on the effectiveness and ease of delivery of your course and changes you would make to improve your course	Transform one of your traditional classes to a distance education format using Blackboard
Team Meetings	Attend all team meetings	Attend all team meetings	
Team Planning	Plan with your team for presentation	Plan with your team for presentation	

Table 3: Semester Two

Category	1st 8 weeks	2nd 8 weeks	Vacation
Workshops	In-house Distance Learning workshop Blog entry on the pros and cons of these workshops	In-house Continuous Improvement workshop Blog entry on the pros and cons of these workshops	Blog entry on the pros and cons of semester two
Distance education	Learn to use iPods Learn to Podcast Use iPods to Podcast at least once during the semester to communicate with your team	Learn to use Adobe Connect Communicate at least once with your team using this software	Communicate with your team via email to update on summer activities

Course Development	Develop a one week sample course using Blackboard Blog entry on the pros and cons of this software	Audit the sample course with your team members as your students Blog entry on the effectiveness and ease of delivery of your course and changes you would make to improve your course	Transform one of your traditional classes to a distance education format using Blackboard
Team Meetings	Attend all team meetings	Attend all team meetings	
Team Planning	Plan with your team for presentation	Plan with your team for presentation	

Table 4: Semester Three

Category	**1st 8 weeks**	**2nd 8 weeks**	**Vacation**
Workshops	In-house distance classroom participation workshop Blog entry on the pros and cons of these workshops	In-house distance classroom promotion workshop Blog entry on the pros and cons of these workshops	Blog entry on the pros and cons of semester three
Distance education	Learn to use webcams and microphones Use webcams and microphones to communicate with other teams at distant sites	Learn to use webcams and microphones for online classroom instruction with Adobe Connect Record online classroom instruction to communicate with other teams at distant sites	Communicate with your team via email to update on summer activities
Course Development	Develop a second sample course using Blackboard and Adobe Connect Blog entry on the pros and cons of this software	Audit the sample course with your team members as your students Blog entry on the effectiveness and ease of delivery of your course and changes you would make to improve your course	Transform second traditional class to a distance education format using Blackboard Compile all of your blog entries in the three-year process and determine which pieces of software/equipment are most effective for you when designing distance education courses.Record this in your blog

Team Meetings	Attend all team meetings	Attend all team meetings	
Team Planning	Plan with your team for presentation	Plan with your team for presentation	

The use of faculty already on contract at the school should be utilized. There should be at least one distance education person, a subject matter expert, four faculty and two library helpdesk persons. It is important to make sure the subject matter expert faculty is computer savvy and people savvy, since the only compensation is many hours of stress. Add an additional technology person to support only this distance education plan before implementing this plan. In its most basic form, this plan should work with existing faculty.

This is meant to be a starting point to develop an implementation plan on our campus. As with any initial plans there are issues and revisions that will need to be made.

Costs and Time Commitment

Obviously in tight economic times the cost of implementing is a concern. As mentioned previously in the paper the use of existing staff is useful. There are several ways to save on training costs that might arise for some of the technology. One method we have used on campus in the past is to send one person to a class and that person come back and shares it with others. Also, for much of the common technology both Purdue and IUPUC have some training that is free of charge or relatively inexpensive such as $35 for a three hour class. Also, the Columbus Learning Center (CLC) offers workshops free of charge to interested faculty on different topics.

A systematic approach to hybrid education development involves long term planning and time commitment. The plan covers the development process for three 16 week academic semesters, and consists of several iterations of hybrid course education development. The iterations are composed of workshops and distance education, course development, team meetings, team planning, and reflection blogging. The iterations also include time between semesters, such as summer breaks. There will be 1 – 3 hour workshop per 8 weeks with a total of 18 hours of face-to-face workshop time. There will be 2 – 30 minute new technology distance education training via on demand computer based training per 8 weeks with a total of 6 hours of new technology distance education training. This totals 24 hours of total commitment of learning new distance education facilitation and technology over the three 16 week academic semesters. For faculty with no prior knowledge of online education or novice, it will take approximately 3 times the number of training and workshop hours for them to develop the course material. This equates to about 90 minutes devoted to the new course development per week and about 10 minutes of reflection blogging per week on top of the workshops and technology education. For faculty with some basic technology background to a tech savvy faculty member, it should take approximately 2 times the number of training and workshop hours for them to develop the course material. This equates to about 60 minutes devoted to the new course development per week and about 10 minutes of reflection blogging per week on top of the workshops and technology education.

Issues

Money always seems to be an issue. As with many universities we are looking at cutting the budget. This is especially true at our state funded university where every dollar spent is being

scrutinized. Typically, training dollars are one of the first areas to be cut and we will need to come up with creative ways to train and save university dollars.

Another issue is selling management on the plan and determining which management to enlist in our efforts. On our campus we work with our department head in West Lafayette who is responsible for our program and curriculum delivered on our campus. We also have our Site Director who is financially responsible for the Purdue site in Columbus, Greensburg and New Albany and answers to the Associate Dean over Statewide Technology. Finally, we have our partner university in Columbus, IUPUC, that delivers all of our support courses for our students. Although we don't report directly to them we interact with the faculty and staff on a day to day basis.

In discussions with our department from the main campus I have found little interest in pursuing hybrid courses. Most classes are delivered in a traditional face-to-face delivery method and there does not appear to be the interest or incentive to pursue a hybrid strategy. At the department level we must deal with our curriculum and interact with the Purdue information systems that handle course registration. Two interesting issues have already arisen. First, our curriculum committee has no written policy for hybrid courses and as far as we know there is no university policy for hybrid courses. For each of our courses we have a section for delivery method and the options are distance and instructor led. This creates a problem in our new university system for registration, if you try to put a three hour class in the system and don't meet the prescribed number of minutes it will kick the class out. Our workaround for the time being is to list the class as distance and in the comments section put the meeting days and times.

At the Purdue Statewide level we have had discussions about hybrid education. One of the issues we have is that again relating back to university efforts to save money they are supporting more distance classes. We have eight statewide sites located throughout the state of Indiana. Statewide is offering more distance education but this is generally in the format of an online class so an instructor in South Bend can teach a class that is utilized by the other campuses. Unfortunately, the hybrid does not lend itself well to that need. There have been some experimentation with having aids at each site and having a face-to-face portion but there have been issues that arise from that such as who should support the class at the other site (in Columbus for a class offered out of Kokomo). If this is staff or adjuncts then they must be paid and if it is a faculty member then there is the issue of how this role would count as contact hours all of which remains unresolved.

Finally, we have our IUPUC partners in Columbus. This may be our best partner, they are at the same location, we can readily share or host training locally and they share many of our same concerns. Also, they could benefit from many of the proposed advantages of the implementation of hybrid courses. At the time of developing this paper we had focused our efforts on working with Purdue at both the department and site level and did not pursue a collaboration with our local partners. However, after discussions IUPUC may be a good fit.

Conclusions

We are very pleased by the success of the limited number of hybrid courses we have offered in C&IT at our Columbus campus. The classes have had positive feedback from the faculty and students and students have performed as well as in traditional face-to-face classes. Also, each section we have offered has been at, or near capacity enrollment. We have had interest from

other faculty about also using a hybrid format. In Computer and Information Technology Department in Columbus we would like to expand its use. We feel increased use of hybrid courses will benefit our department in both recruiting and providing quality classes. For that reason we have developed an implementation plan for hybrid education. This is our first cut at this plan and we expect to make changes as we progress but we feel it is a good start. Although, we didn't find the support we had hoped for at the department and site level we were definitely not discouraged from pursuing this at either level. Our next step in implementing this plan is to approach our partners at IUPUC and possibly our neighbors at Ivy Tech Community College and the Columbus Learning Center, all local entities that share the same resources on our campus and could benefit from a hybrid education implementation plan.

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TPCK : A Revision of the Technology Course for Teachers

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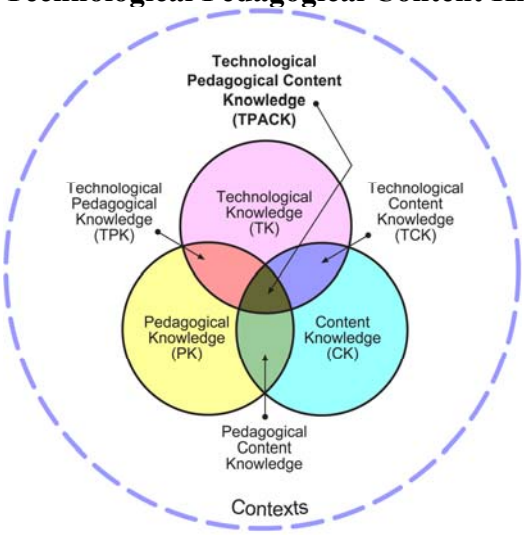
The University of Indianapolis is a private Methodist-affiliated liberal arts university located on the south side of Indianapolis. Its teacher education program has had a course originally titled "Microcomputer Applications in Education" renamed several years ago as "Technology in Education I." The course number is EDUC 220. It has served as the foundation course in educational technology for nearly 20 years. Freshman and sophomore teacher candidates in elementary and secondary education take this course, and it may be the only technology class they take prior to licensing. It has been carefully aligned with all ISTE and NCATE technology standards. It has also satisfied the liberal arts core requirement for these candidates.

During the spring of 2008 the chair of the Department of Teacher Education began discussions regarding redesigning the technology curriculum. Publication in 2008 of the Handbook of Technological Pedagogical Content Knowledge (TPCK) for Educators edited by the AACTE Committee on Innovation and Technology began to have an impact on the way universities and others viewed preparation of teaching candidates to apply technology in their teaching. The pioneering work of researchers Matthew J. Koehler and Punya Mishra, describing the power of TPCK, was being disseminated through the profession through publications and conference presentations. It was time, thought our chair, to study this body of research and apply it to our curriculum.
For the fall semester of 2008 Professor George Weimer, one of the instructors of this course, was granted three credit hours of released time to examine current trends and future needs for the courses offered for educational technology integration. He proposed to present several options to the Department of Teacher Education as it considered staffing needs for the future.

Summary of content from AACTE Committee on Innovation and Technology, (2008). Technological Pedagogical Content Knowledge for Educators. New York, NY: Routledge:



(Source: http://tpack.org/)

The diagram above shows intersections of content knowledge, pedagogical knowledge, and technological knowledge. It is helpful to understand the intersections of Pedagogical Content Knowledge, Technological Pedagogical Knowledge, and Technological Content Knowledge. But, the central issue is where all three basic areas intersect: Technological Pedagogical Content Knowledge. For teacher education institutions, it is assumed that content area methods instructors possess content knowledge. In order to be qualified to teach the content methods course within the teacher education curriculum, it must also be assumed that the instructor possesses pedagogical content knowledge (the intersection labeled Pedagogical Content Knowledge) or the ability to teach the content to candidates. The additional ability to apply technology properly to the teaching of the content area results in the combination of the three areas (TPCK) and may require that the institution rethink how content area instructors are prepared and how they prepare to teach.

Authors describe Technological Pedagogical Content Knowledge (TPCK) as representing a "wicked problem" (p. 10). They write, "Solutions to wicked problems are often difficult to realize (and maybe even recognize) because of complex interdependencies among a large number of contextually bound variables." (p. 10). The book goes into detail describing the nature of the problem.

"Implicit in the acknowledgment of the wickedness of the technology integration problem is the suggestion that teacher education programs have tended to over-simplify how technology integration is addressed…. The classic example of this over-simplification was the separation of educational technology as a field of study for preservice and in-service teachers. Examples of these phenomena include single courses on technology applications for preservice teachers…." (p. 292)

The authors caution that "Ignoring the complexity inherent in each knowledge component, or the complexity of the relationships among these components, can lead to oversimplified solutions or

failure." (p. 18) And they warn "Viewing any of these components in isolation from the others represents a real disservice to good teaching. (p. 18)

Our present university computer lab (18 student stations with iMac computers and Windows XP virtualization software) and other nearby resources allowed for the following experiences through software exploration and integration: Macintosh and Windows operating systems, Microsoft Office, Inspiration, iMovie, iDVD, PhotoShop, Audacity, Garage Band, most Web-based experiences, Tux Paint, KidPix, Photo Booth, and an interactive SmartBoard. The course historically has integrated use of blogs, wikis, and podcasts and introduced the concept of Project-Based Learning through use of Edutopia movies (http://www.edutopia.org) and project-based assignments.

We believed that what we offered in the EDUC 220 course met the NETS-Teacher and NCATE standards for technology use and that it introduced the NETS-Student standards adequately. But, we believe revision of the course, and the overall plan for integrating technology into the teacher education curriculum is necessary.

Note the following paragraph from the NCATE book: "*it seems obvious that the skills and knowledge teachers require will not be realized anymore by just taking the one 'technology course' offered by many institutions. In such a course candidates typically learn how to use technologies, but the pedagogical knowledge and content knowledge required for subject area application are often ignored. Currently, there seems to be agreement that the content taught in most technology courses should be strengthened and extended throughout the teacher preparation program by other faculty who model technology for instructional and administrative tasks…. In practice this is extremely difficult to accomplish unless the appropriate support structures for teacher education faculty are in place."* (p. 78)

The book discusses the problematic nature of effective engagement in TPCK and suggests developing a disposition to remain open and engage in experimentation when using technology tools. (p. 153)

One author of the NCATE book in the chapter on teaching science cautions, "Knowledge of technologies for teaching a particular topic, such as that described for weather, could be taught in teacher education programs or professional development, but two problems with trying to teach such specific content are (a) it may prove to be useless to some or all of the candidates when they become teachers and find that they do not have access to the technologies required or that the class they are teaching does not include the topic they learned about; and (b) it is impossible to 'cover' the terrain of science to teach either TPCK or PCK across the domain. Even with a PCK class to accompany every science class a prospective teacher takes in college (an impractical if not absurd idea) it would not be possible to anticipate the contexts in which students would teach." (p. 203)

The author continues, "What can be done then to help teachers develop TPCK? In teacher education programs, the content courses must themselves include uses of technology integral to the subject matter." (p. 204)

Another of the authors suggests "Researchers have explored various models for integrating technology into teacher preparation programs and have concluded the importance of inclusion in all courses and experiences in the programs." (p. 226)

Still another writer makes a distinction between teachers who use truly transformative software tools and those teachers who choose to use tools like presentation software, student-friendly Internet, and management tools. (p. 252) The author writes, "curricular transformation happens only in those few content areas (e.g. music, literacy, and art) that are largely defined by the media they use." (p. 253)

The final chapter of the book gives considerable insight to the challenge faced by teacher educators who are serious about TPCK: "Even though some technologies may indeed facilitate student learning, content and pedagogy are crucial ingredients in this success. And if the pedagogical content knowledge required for each discipline differs, it follows that the ways in which technology might best be used for each discipline may also differ." (p. 273)

So it was generally agreed by those involved in discussions of the future of technology integration in the teacher education curriculum that technology issues would be discussed and applied in some or all of the content area methods classes. But how do we do that?

Constraints:

While the unit has achieved quality in pedagogical content knowledge (all of our instructors are experts in their content areas and in pedagogical practice) the technological competencies of existing faculty are developing. The may be motivated to teach technology in their courses, but they may require support and instruction from someone who is more advanced in use, and educational application, of the technologies in that content area. We wondered whether there could be sufficient time available in the teaching day/week/year for content area instructors to integrate forward-looking technologies in an appropriate manner into their content area classes.

We have presently no mechanism for checking the extent or completeness of technology integration in field placements, prior to or during student teaching.

Recommendations:

Three broad suggestions seemed obvious:

1. Keep the present plan with some refinement (probably not desirable).

2. Teach a basic though smaller technology application course to first year candidates and integrate full TPCK into a selected number of content area methods courses during the remaining three years, including the student teaching semester (more desirable, but will content area methods instructors have the necessary skills to integrate technology adequately?).

3. Modify option two to have a technology person teach the smaller technology application course for first year candidates and collaborate with other content area instructors to develop and carry out technology-rich learning activities that are project-based. This is my recommendation (perhaps the best solution).

The essential modeling of TPCK in recommendation three seems the most likely to succeed. One difficulty of EDUC220 has been the fact that candidates taking the class in their first year will not actually be certified teachers until four years later! Recommendation three addresses this concern.

Suggested syllabus for a newer, leaner EDUC220 (2 credit hr?):

- Logging in to use campus network resources
- Blackboard basics
- TK 20 basics (TK20 is a data collection and portfolio building tool adopted by the Teacher Education Department in 2008)
- Blogging and wiki basics (and other Web 2.0 applications)
- Introduction to ISTE NETS (National Educational Technology Standards) standards for teachers and students (could be integrated into MS Word or PowerPoint assignments)
- MS Word project (possibly a newsletter on a topic related to technology in schools)
- MS Word and Excel mail merge tutorial
- MS PowerPoint short tutorial and interactive project-based learning project
- MS Excel tutorial and project (grade book and short project-based database)
- Inspiration tutorial and short project-based learning assignment
- Kid Pix and Tux Paint tutorials
- WebQuest tutorial resulting in a short project-based lesson
- Introduction to scanning, image adjusting, and video editing

The intent is to provide a common background of experiences that every content area methods instructor would assume students would have coming into their class.

What would be eliminated from the present EDUC220 syllabus (3 credit hr)?
Current emphasis on Project-Based Learning
Two PowerPoint assignments (Family Tree and PowerPoint quiz)
Longer WebQuest lesson assignment
Current integration of blog and wiki into assignments/projects
Close examination of content-area specific Web resources for teachers and students

These and other technology integration issues would be moved or integrated into content area courses. We suggested that content area methods courses explore the following possible technologies for learning:

- Digital photography with or without PowerPoint
- Digital movies using iMovie or MovieMaker
- Blogs, wikis, and social bookmarking integrated into learning activities
- Student produced podcasts using Garage Band or Audacity
- Project-based WebQuests for any content area or level
- Projects using Kid Pix or Tux Paint graphics (could be integrated into PowerPoint or Word)
- Inspiration concept mapping and brainstorming for project-based learning
- Spreadsheets to create and use databases, budgets, and gradebooks within projects
- Spreadsheets for teaching math concepts
- Project-Based Learning assignments where groups of students work to solve an authentic problem in the content area
- Content area-specific Web resources for teachers/student

- Assistive-adaptive devices for special learners as appropriate for the content
- Special technologies such as those used in science or kinesiology to bring data about the physical world into computers for further study

Next steps:

Following submission of the released time report, the Teacher Education Department Chair charged a committee, chaired by the Director of Graduate Programs in Teacher Education, with the responsibility of working out details for an action plan for the future. The chair invited three technology support staff from a local K-12 school district to serve as ad hoc members of the committee to provide a wider perspective. That was a brilliant decision!

Among the charges to the committee from the chair were:

1. Identify the essential technological knowledge, skills, and dispositions that graduates need to positively influence student learning.

2. Design a plan that provides graduates with identified essential knowledge, skills, and dispositions. Included in the plan (should be) a timeline for implementation, list of "essentials" (personnel, hardware/software), and course/module/performance descriptors.

Factors to consider:

1. Technology plan may or may not conform to the traditional 16-week semester with a single instructor.

2. Candidates come to the program with various skill levels. How do we honor these differences?

3. Content areas require specialized technology skills. How do we provide these? What partnerships (e.g. K-12) might help us provide specialization?

4. If we believe that all teachers are teachers of technology, what are the professional development implications for faculty?

5. Think of current roadblocks to greater use of technology. Are there ways to use existing resources in new ways?

6. How do we get started? Include a timeline for implementation?

7. Technology is constantly changing. How is this addressed in the program?

At the time of this writing, the technology committee has been actively engaged for approximately five months addressing these issues. Discussions will continue, and during the month of May 2009 the committee will present a report to the teacher education faculty with their recommendations. It appears likely that content area methods course descriptions will be rewritten during the 2009-2010 school year and be gradually implemented thereafter. The ASCUE presentation will have more information about discussions and discussions occurring after this writing.

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Getting Started with COBIT: Applying COBIT Principles to IT

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Abstract

This presentation will provide a brief introduction to the COBIT 4.1 IT governance model and its importance in information technology management, strategic planning, and policy development. It will discuss the design and implementation of standardized policies, especially service level agreements and acceptable use policies. Discussion on service level agreements will cover scope of work; identify relevant stakeholders and accountable parties; define and enumerate the metrics of accountability for both the vendor and the institution; and set forth the parameters of fulfillment such as time frame, total costs, and acceptable responses for failure to meet the specifications of the agreement. This presentation will discuss the application of COBIT governance principles to security and acceptable use policies.

Video Tutorials—Capture the Experience!

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Abstract

I had been creating web-based learning modules for many years now. The software demonstrated during this session does not have a heavy learning curve often associated with such productions. The creation and distribution of a multimedia learning module via the web or on a CD can seem daunting to the inexperienced user. It is often assumed that the developer must have weeks/months of training and experience. It is also often assumed that you must utilize expensive and complicated software to produce and distribute such a product. It might never occur to you that a faculty member with very little technical experience might single-handedly tackle such a project. This session will introduce users to Camtasia™, a piece of software that is: • Inexpensive… Current Academic Price = $199, bundled with SnagIt • Easy for a non-computer-faculty to learn its "basics" • Useful to those wishing to produce narrated Windows Media or Flash-based multimedia learning modules from "screen capturing" or direct PowerPoint Recording with no Flash experience whatsoever. • Fully "automatic" if desired, yet capable of more advanced features and options once the user is more experienced • Flexible in that ALL SORTS of "presentations" can be produced including "PR" materials, web-tour productions, lab-based-recordings, software demonstrations, etc. Camtasia and Snagit are available for thirty-day trial periods from: http://www.techsmith.comFor those who feel they MUST walk away with something TANGIBLE, there might even be some Techsmith marketing "give-aways" which will be distributed at the paper presentation, and very likely taste tests of my home-made beef jerky!

Print Tracking and Charging

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Abstract

This proposal is for a demonstration of the software used to track and charge printing at Moravian College. The demonstration and question/answer session will include a brief timeline of print charging at our College as well as the steps taken in the implementation process. A history of printing statistics will be shown with their correlation to a reduction in printing and paper costs. The presentation will include the process used to make the students, faculty, and staff aware of print tracking and charging as well as discussing the emphasis placed on "Going Green." Specifically, the product demonstrated will be PaperCut (www.papercut.com). This is a print quota, accounting, and control software that is relatively cheap for its features and ease of use.

Improving Campus Technology Support - A Tiered Response Help Desk Structure

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Abstract

Providing quality customer service to students, faculty and staff can be a challenge in any setting but particularly on the higher ed campus. Moving from a one man back room tech to a 3 tiered network of technical support personnel took planning, time and experimentation. This presentation is designed to share our struggles, failures, successes and future plans.

Social Networking and ASCUEville

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Abstract

This session will briefly talk about Social Networking and give a few examples and then primarily focus on the conference social networking site. ASCUEville. This session is especially good for newcomers who want to be part of ASCUEville.

Taking Children's Literature Out of This World

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Abstract

Children's literature has numerous examples of books that contain references to places of note, historical sites, or distances traveled by the characters within. One way to enrich the students' encounters with those references is to use Google Earth and Keystone Markup Language. This presentation will demonstrate such a strategy.

Second Life – Our Journey into the Virtual Realms

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Abstract

There is a strong buzz swirling around technologies that immerse people within interactive virtual worlds. Faculty around the globe are developing content for these worlds and are bringing these tools into the classroom. Publications and presentations at various conferences are further bolstering interest in the possibilities of using virtual worlds as teaching tools. A few of our own at UNOH have become excited by the prospects as well. Therefore, we started down our own road of developing ideas and possible content. This eventually culminated in the selection of the virtual world called Second Life. This presentation chronicles our journey as we wrestled with and questioned the use of virtual worlds. It progresses with a demonstration of just a few examples of the vast amount of content that is available. Then we visit the UNOH Island and show the progress that is being made in developing our own learning space.

Put Your Students in the Cloud: Google Apps for Education

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Abstract

Google Apps offers free email hosting, document collaboration and calendaring to educational institutions. Learn how Google Apps saved PBU's IT department time and money while offering students a lifelong .edu address, Gmail-based webmail, more storage space and better reliability than our old self-hosted system. We'll also show off Google Docs, an online competitor to MS Office with excellent group collaboration capabilities and Google Calendar, a great resource for personal, group and organizational scheduling. Finally, we'll touch on advanced features allowing single sign-on with your existing student account system and automatic provisioning of new student accounts. Come see how Google Apps is revolutionizing computing at PBU!

Microsoft Office 2008 for Apple Computers - What's New?

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Abstract

This demonstration is designed to give you a basic understanding of the changes implemented by Microsoft on their new Office suite of software for Apple computers. Microsoft has changed several notable things in their Office layout, including: Toolbars, the Office Toolbox and the Elements Gallery. There are also some changes in functionality, such as the ability to save files as PDF's and the elimination of Visual Basic macros. Some time will be spent on the new Open XML format and compatibility issues. Finally, we will discuss a few changes to the Word, Excel and PowerPoint applications, specifically focusing on the new Word Publishing Layout view and using Excel Ledger sheets. This session is packed with informative material for anyone using or supporting Office 2008 for Apple computers.

Creation and Application of Digital Storytelling for All Grade Levels

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Introduction

During this session, you will discover how to use digital storytelling in an academic setting for pre-service teachers. This project was designed for freshmen elementary and secondary education majors enrolled in Introduction to American Education. This project could easily be utilized in K-Higher Education settings. Some questions and aspects we will address during the presentation are:

- What is Digital Storytelling?
- Why use Digital Storytelling?
- The storytelling process
- Technology tools we use
- Examples of student work

This project helped individual students to further develop their technology skills in creating an instructional movie. The subject of the movie was the student's choice, but a topic to expand on during their sophomore year was strongly encouraged. Each project was to include a minimum of: title slide, 1 still picture, 1 movie clip, music, 1 on-video or on-slide caption, 1 transition, and 1 video effect.

Our focus of the assignment was: *How can students get hooked on learning?*
Through the use of digital storytelling . . . learning can come alive for even non-readers; develop students' higher order skills and creativity; span different content areas; blend writing, technology and emotion to create a meaningful learning experience; and empower learners with diverse backgrounds, characteristics and abilities.
With the use of free or low cost technology tools, a teacher or student need only be limited by his or her imagination.

You will have access to the materials, tools, tutorials and resources to create your digital storytelling project, in addition to having concrete examples via our web pages:
http://www.franklincollege.edu/pwp/vmast/Digital_Storytelling/Digital_Storytelling.html

Spicing Up Your Class With Adobe Acrobat Connect Pro

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Abstract

As we attempt to compete in an ever competitive market for students in information technology, it is important that we have the tools that provide the instructors flexibility and the ability to reach students outside of the regular classroom. We are expanding our classes to go beyond traditional instructor led classes with both online and hybrid courses. These courses require technology to develop and deliver the courses. Adobe Acrobat Connect Pro is one of the tools we use at Purdue University. Adobe Acrobat Connect Pro is a tool that allows educators to quickly add sound and animation to course materials that are Adobe Flash Player compatible. Adobe Acrobat Connect Pro also extends the boundaries of the classroom by providing effective online collaboration, so students may participate in classes even if they are not on campus. I will discuss the capabilities of Adobe Acrobat Connect Pro and give a short demonstration on using it effectively in the classroom.

Meru Networks - Wireless Technologies

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Abstract

Meru Networks develops and markets wireless infrastructure solutions that enable the All-Wireless Enterprise. Its industry-leading innovations deliver pervasive, wireless service fidelity for business-critical applications to major Fortune 500 enterprises, universities, healthcare organizations and local, state and federal government agencies.

Drupal - A CMS for Everyone

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Abstract

In a world where anyone can have a website, it doesn't take a great deal of technical knowledge to build a simple website with interactive functionality. Drupal is one of the more popular Content Management Systems (CMS) out there. This session will cover a brief overview of what a CMS is, how a simple Drupal website can enhance your web presence, and how it can be used in an educational environment to facilitate discussion and social networking. Themes & modules relating to Drupal will also be discussed. Examples sites will be given (including the ASCUE website and its custom modules) and a list of helpful Drupal resource websites will also be provided.

A Slightly More Advanced Drupal Session - The Nuts & Bolts

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Abstract

This is a follow up session to the previous Drupal Session. In this session, I will introduce some of the more advanced Drupal concepts, such as customizations, advanced theming, and modules. A software demonstration will be given of how to manipulate one's Drupal site, and make simple customizations.

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