ASSOCIATION OF SMALL COMPUTER USERS IN EDUCATION

"Continuing Second Quarter Century of Service"

Proceedings of the 2012 ASCUE Summer Conference

45th Annual Conference
June 10 - 14, 2012

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"

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June 10 – 14, 2012
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://groups.google.com/a/ascue.org/group/members and follow the directions. To send an e-mail message to the Listserve, contact: members@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 2012 Conference to Tom Marcais, Program Chair, ASCUE 12, Sweet Briar College, 134 Chapel Road, Sweet Briar, VA, 24595, 434-381-6543, tmarcais@sbc.edu
Web: http://www.ascue.org

Association of Small Computer Users in Education
ASCUE 2011-2012 Board Members
(years remaining in office including current year)

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Keynote Speaker

This year we are replacing the keynote speaker with a "Five Minutes of Fame" program. Each school that volunteers will have the opportunity to provide a five minute update on something innovative happening on their campus. The audience will vote for the best two or three presenters who will receive prizes.

Pre-conference Workshops

These have been replaced by late afternoon 90 minute sessions during the conference.

Workshop 1
How to be productive in and out of the classroom with your IPad
Presented by: Janet Hurn, Miami University at Middleton

So many people now own or are contemplating purchasing an iPad but are they using it to its fullest potential? Come join us to see how an iPad can make your time more productive. We will demo some of the popular and not so well known apps. Some of them cost a little bit of money and some are free. We will also show you how the iPad makes our lives more productive and can make teaching better. Bring your iPad or just come and see if an iPad is something you should invest in. Throughout the workshop, we'll be using video mirroring with AirPlay and an AppleTV. If you're using an iPad 2 with iOS 5, you can mirror your screen too!

About the Presenter: Janet has been attending ASCUE so long she has lost count. She is currently the Interim Coordinator of E-learning at the Miami University Regional campuses and is STILL finding cool tools.

Workshop 2
Creating engaging and interactive learning experiences with clickers
Presented by: Andrea Han, University of British Columbia

Looking for ways to engage students and provide opportunities for interaction in the classroom? This hands-on session will model best practices for clicker (i.e. personal response system) use in the classroom. Clickers can be used in a variety of ways to motivate students to both engage meaningfully with course material and one another during class. The choices instructors make when using classroom responses systems, along with the nature of the questions asked using the systems, largely determine these motivational effects. Join us to discuss the variety of ways you can use clickers to engage your students in the classroom. This hands-on session will discuss best practices for using clickers, as well student opinions on the use of clickers. Although we will use TurningPoint for this workshop, the techniques we discuss can be used with any Personal Response System. Attendees who bring their own laptop will have the opportunity to interact with the free TurningPoint software which can be downloaded from http://www.turningtechnologies.com/responsesystemsupport/downloads/ We will demonstrate the TurningPoint software as well as TurningKey and TurningPoint Anywhere. Also, we'll be demonstrating a product by TopHatMonocle. For more information go to http://www.tophatmonocle.com. Please keep in mind that one lucky attendee of the ASCUE business meeting will walk away with a free clicker and receiver set from TurningTechnologies!

About the Presenter: Andrea Han is an instructional technologies analyst for the Faculty of Science at the University of British Columbia and is the current president of ASCUE.

Workshop 3
Learn to Screencast!
Presented by: Stephen T. Anderson Sr., University of South Carolina Sumter

With our millennial learners becoming even more "wired in," many educators are finding more ways to reach them in media-rich experiences. If you "know a little" or are a raw beginner, it might be an opportune time to review some of the skills and techniques utilizing commercial software available for free or very low cost. This "tutorial" session will explore some of these techniques that have been effectively utilized inside and outside the traditional classroom, as well as hybrid and on-line classes. We will actually create some short productions to demonstrate the shortened learning curves that continue to become more manageable, even for the novice user. We hope you will return to your campus motivated to expand your screencasting capabilities and opportunities. Although you will be welcome to attend without one to "learn with a team mate), optimally you should bring a notebook computer with PowerPoint (07 or newer), Camtasia, JING and SnagIt pre-loaded (we only have 1.5 hours). The last three are all available as free trials at http://www.techsmith.com I will supply a headset (with microphone) for use during the workshop (you may bring your own if you wish… I have not had as much luck with built-in notebook microphones)

About the Presenter: Steve is an Associate Professor of Math/Science/Engineering and has been active in ASCUE since the early 90's presenting numerous papers and workshops... and makes some notorious beef jerky (yes--bribery DOES work sometimes). His main interest area is in pedagogical advances and educational paradigm shifts, almost always involving technology. He has, on occasion, been known to "get excited" about his craft.

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, session with paper where the author submits a paper but it is not reviewed, and session without paper 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 section, up to page 60, will contain the refereed papers, the second section, from 61 to 107, will hold the papers from the sessions with paper, and the last section will list the abstracts for the other sessions.

ASCUE BOARD OF DIRECTORS FROM 1967 to 2012

At this conference we celebrate the 45th 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-five years and we have printed these names on the following pages.

ASCUE BOARD OF DIRCTORS FROM 1967 to 1972

	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
Past President	Al Malveaux Xavier, New Orleans	Ken Zawodny St. Joseph's College	Howard Buer Principia College	Jack Cundiff Muskingum College
Treasurer	Howard Buer Principia College	Al Malveaux Xavier University	Al Malveaux Xavier University	Al Malveaux Xavier University
Secretary	John Robinson	Dorothy Brown South Carolina State	Dorothy Brown South Carolina State	Dick Wood Gettysburg College
Board Members	James Folt Dennison University	James Folt Dennison University	James Foit Dennison University	John Orahood U. of Arkansas, LR
At Large	Don Glaser Christian Brothers C.	Don Glaser Christian Brothers	Don Glaser Christian Brothers	N. Vosburg Principia College
Public Relations				Dan Kinnard Arizona Western
Librarian				Jack Cundiff Muskingum College
Equip. Coordinator				
Web Coordinator				
Location:	Tarkio College	Principia College	Muskingum College	Christian Brothers

ASCUE BOARD OF DIRCTORS FROM 1972 to 1976

	1972-73	1973-74	1974-75	1975-76
President	James McDonald Morningside College	Dan Kinnard Arizona Western	T. Ray Nanney Furman University	Larry Henson Berea College
Program Chair	Dan Kinnard Arizona Western	T. Ray Nanney Furman University	Larry Henson Berea College	Jack McElroy Oklahoma Christian
Past President	Wally Roth Taylor University	James McDonald Morningside College	Dan Kinnard Arizona Western	T. Ray Nanney Furman University
Treasurer	J. Westmoreland U. Tenn Martin	J. Westmoreland U. Tenn Martin	Jim Brandl Central College	Jim Brandl Central College
Secretary	Ron Anton Swathmore College	Ron Anton Swathmore College	Harry Humphries Albright College	Harry Humphries Albright College
Board Members	John Orahood U. of Arkansas, LR	Al Malveaux Xavier, New Orleans	Sister Keller Clarke College	Sister Keller Clarke College
At Large	N. Vosburg Principia College	Wally Roth Taylor University	Wally Roth Taylor University	Mike O'Heeron
Public Relations	Dan Kinnard Arizona Western	Dan Kinnard Arizona Western	Dan Kinnard Arizona Western	Dan Kinnard Arizona Western
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 1976 to 1980

	1976-77	1977-78	1978-79	1979-80
President	Jack McElroy Oklahoma Christian	Harry Humphries Albright College	Fred Wenn Caspar College	Doug Hughes Dennison University
Program Chair	Harry Humphries Albright College	Fred Wenn Caspar College	Doug Hughes Dennison University	J. Westmoreland U. Tenn Martin
Past President	Larry Henson Berea College	Jack McElroy Oklahoma Christian	Harry Humphries Albright College	Fred Wenn Caspar College
Treasurer	William Roeske Houghton College	William Roeske Houghton College	James Foit Central Ohio Tech	James Foit Central Ohio Tech
Secretary	Doug Hughes Dennison University	Doug Hughes Dennison University	Dave Dayton Grove City College	John Jackobs Coe College
Board Members	Dave Dayton Grove City College	Dave Dayton Grove City College	Jan C. King Chatham College	Wally Roth Taylor University
At Large	Fred Wenn Casper College	John Jackobs Coe College	John Jackobs Coe College	Jan C. King Chatham College
Public Relations	Dan Kinnard Arizona Western	Sister Keller Clarke College	Sister Keller Clarke College	Sister Keller Clarke College
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

ASCUE BOARD OF DIRCTORS FROM 1980 to 1984

	1980-81	1981-82	1982-83	1983-84
President	J. Westmoreland U. Tenn Martin	John Jackobs Coe College	Jan Carver Chatham College	Wally Roth Taylor University
Program Chair	John Jackobs Coe College	Jan Carver Chatham College	Wally Roth Taylor University	Dudley Bryant Western Kentucky
Past President	Doug Hughes Dennison University	J. Westmoreland U. Tenn Martin	John Jackobs Coe College	Jan Carver Chatham College
Treasurer	Ron Klausewitz W. Virginia Weslyan	Ron Klausewitz W. Virginia Weslyan	Harry Lykens Mary Institute, St L.	Harry Lykens Mary Institute, St. L.
Secretary	Jan Carver Chatham College	Ken Mendenhall Hutchinson CC, KS	Ken Mendenhall Hutchinson CC, KS	John Jackobs Coe College
Board Members	Dudley Bryant Western Kentucky	Dudley Bryant Western Kentucky	William Roeske Houghton University	William Roeske Houghton University
At Large	Wally Roth Taylor University	Chuck Mcintyre Berea College	Chuck Mcintyre Berea College	Bob Renners Kenyon College
Public Relations	Sister Keller Clarke College	Sister Keller Clarke College	Sister Keller Clarke College	Sister Keller Clarke College
Librarian	Jack Cundiff Muskingum College	Jack Cundiff Muskingum College	Jack Cundiff Muskingum College	Jack Cundiff Muskingum College
Equip. Coordinator				
Web Coordinator				
Location:	U. Tenn Martin	Coe College	Chatham College	Taylor University

ASCUE BOARD OF DIRCTORS FROM 1984 to 1988

	1984-85	1985-86	1986-87	1987-88
President				
	Dudley Bryant	Paul Pascoe	Jack Cundiff	Keith Pothoven
	Western Kentucky	Vincennes University	Horry-Georgetown	Central College
Program Chair				
	Paul Pascoe	Jack Cundiff	Keith Pothoven	David Cossey
	Vincennes University	Horry-Georgetown	Central College	Union College
Past President				
	Wally Roth	Dudley Bryant	Paul Pascoe	Jack Cundiff
	Taylor University	Western Kentucky	Vincennes University	Horry-Georgetown
Treasurer				
	Harry Lykens	Harry Lykens	Maureen Eddins	Maureen Eddins
	Mary Institute, St. L	Mary Institute, St. L	Hadley School Blind	Hadley School Blind
Secretary				
	John Jackobs	John Jackobs	John Jackobs	Dudley Bryant
	Coe College	Coe College	Coe College	Western Kentucky
Board Members				
	Keith Pothoven	Keith Pothoven	Robert Hodge	Robert Hodge
	Central College	Central College	Taylor University	Taylor University
At Large				
	Bob Renners	Carol Paris	Carol Paris	Ann Roskow
	Kenyon College	Goshen College	Goshen College	Ister CC
Public Relations				
	Dough Hughes	Wally Roth	Wally Roth	Wally Roth
	Dennison University	Taylor University	Taylor University	Taylor University
Librarian				
	Jack Cundiff	Jack Cundiff	Jack Cundiff	Jack Cundiff
	Muskingum College	Muskingum College	Horry-Georgetown	Horry-Georgetown
Equip. Coordinator				
Web Coordinator				
Location:	W. Kentucky	Vincennet	Myrtle Beach	Myrtle Beach

ASCUE BOARD OF DIRCTORS FROM 1988 to 1992

	1988-89	1989-90	1990-91	1991-92
President				
	David Cossey	Tom Warger	David Redlawsk	Bill Wilson
	Union College	Bryn Mawr College	Rudgers University	Gettysburg College
Program Chair				
	Tom Warger	David Redlawsk	Bill Wilson	Carl Singer
	Bryn Mawr College	Rudgers University	Gettysburg College	DePauw University
Past President				
	Keith Pothoven	David Cossey	Tom Warger	David Redlawsk
	Central College	Union College	Bryn Mawr College	Rudgers University
Treasurer				
	Maureen Eddins	Maureen Eddins	Tom Pollack	Tom Pollack
	Hadley School Blind	Hadley School Blind	Duquesne University	Duquesne University
Secretary				
	Dudley Bryant	Kathy Decker	Kathy Decker	Dagrun Bennett
	Western Kentucky	Clarke College	Clarke College	Franklin College
Board Members				
	Kathy Decker	Dagrun Bennett	Dagrun Bennett	Mary Connolly
	Clarke College	Franklin College	Franklin College	Saint Mary's College
At Large				
	Ann Roskow	Rick Huston	Rick Huston	Rick Huston
	Ister CC	South Caolina/Aiken	South Caolina/Aiken	South Caolina/Aiken
Public Relations				
	Wally Roth	Wally Roth	Wally Roth	Wally Roth
	Taylor University	Taylor University	Taylor University	Taylor University
Librarian				
	Jack Cundiff	Jack Cundiff	Jack Cundiff	Jack Cundiff
	Horry-Georgetown	Horry-Georgetown	Horry-Georgetown	Horry-Georgetown
Equip. Coordinator				
Web Coordinator				
Location:	Myrtle Beach	Myrtle Beach	Myrtle Beach	Myrtle Beach

ASCUE BOARD OF DIRCTORS FROM 1992 to 1996

	1992-93	1993-94	1994-95	1995-96
President				
	Carl Singer DePauw University	Rick Huston South Carolina/Aiken	Mary Connolly Saint Mary's College	Paul Tabor Clarke College
Program Chair				
	Rick Huston South Carolina/Aiken	Mary Connolly Saint Mary's College	Paul Tabor Clarke College	Carl Singer DePauw University
Past President				
	Bill Wilson Gettysburg College	Carl Singer DePauw University	Rick Huston South Carolina/Aiken	Mary Connolly Saint Mary's 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	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 1996 to 2000

	1996-97	1997-98	1998-99	1999-2000
President	Carl Singer DePauw University	Carl Singer(acting) DePauw University	Bill Wilson Gettysburg College	Dagrun Bennett Franklin College
Program Chair	Chris Schwartz Ursuline College	Bill Wilson Gettysburg College	Dagrun Bennett Franklin College	Carol Smith DePauw University
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

ASCUE BOARD OF DIRCTORS FROM 2000 to 2004

	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

ASCUE BOARD OF DIRCTORS FROM 2004 to 2008

	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
Treasurer				
	Tom Pollack Duquesne University	Tom Pollack Duquesne University	Tom Pollack Duquesne University	Tom Pollack Duquesne University
Secretary				
	Kim Breighner Gettysburg College	Kim Breighner Gettysburg College	Kim Breighner Gettysburg College	Kim Breighner Gettysburg College
Board Members				
	Lisa Fears Franklin College	Blair Benjamin Philadelphia Bible	Blair Benjamin Philadelphia Bible	Janet Hurn Miami U. Middleton
At Large				
	David Frace CC Baltimore County	David Frace CC Baltimore County	David Fusco Juniata College	David Fusco Juniata 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				
	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

ASCUE BOARD OF DIRCTORS FROM 2008 to 2012

	2008-09	2009-10	2010-2011	2011-2012
President				
	Fred Jenny Grove City College	Janet Hurn Miami U Middleton	Janet Hurn Miami U Middleton	Andrea Han U of British Columbia
Program Chair				
	Janet Hurn Miami U Middleton	Dave Fusco Juniata College	Andrea Han U of British Columbia	Tom Marcais Sweet Briar College
Past President				
	George Pyo Saint Francis College	Fred Jenny Grove City College	Fred Jenny Grove City College	Janet Hurn Miami U Middleton
Treasurer				
	Tom Pollack Duquesne University	Tom Pollack Duquesne University	Dave Fusco Juniata College	Dave Fusco Juniata College
Secretary				
	Kim Breighner Gettysburg College	Kim Breighner Gettysburg College	Kim Breighner Gettysburg College	Kim Breighner Gettysburg College
Board Members				
	Dave Fusco Juniata College	Thomas Marcais Lee University	Thomas Marcais Lee University	Jeffery LeBlanc U of NW Ohio
At Large				
	Andrea Han Miami U Middleton	Andrea Han Miami U Middleton	Mark Poore Roanoke College	Mark Poore Roanoke 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				
	Hollis Townsend Young Harris	Hollis Townsend Young Harris	Hollis Townsend Young Harris	Hollis Townsend Young Harris
Web Coordinator				
	Steve Weir	Steve Weir	Steve Weir	Steve Weir
Location:	Myrtle Beach	Myrtle Beach	Myrtle Beach	Myrtle Beach

Using Calibrated Peer Review to Encourage Writing

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Abstract

This paper explores the use of peer review tools to encourage writing in the Sciences. Three peer review tools in use at the University of British Columbia are reviewed, with an emphasis on Calibrated Peer Review. Concerns related to the peer review process are also discussed and suggestions are offered for instructors considering peer review.

Introduction

In 1996, the National Research Council released the National Science Education Standards which encouraged faculty to engage students more explanation and communication to enhance scientific understanding (NRC, 1996). Despite this, at the university level, writing assignments in the Sciences are often limited to small, upper division classes and rarely occur in larger lower division courses (Rudd, et al., 2009). For many faculty, the workload related to evaluating writing assignments is an barrier that prohibits implementation (ELI, 2005).

Instructor evaluation of assignments is referred as the "expert marking approach" by Paré & Joordens (2008) who describe shortcoming to this grading process. "[S]tudents do not see any assignment other than their own and therefore do not experience both poorly and well-written work, preventing an occasion to understand what makes a composition relatively strong (or weak), thereby diminishing an opportunity for students to improve the quality of their work (Paré & Joordens, p. 2)." Therefore, Paré & Joordens recommend the implementation of peer review, also referred to as peer assessment or peer evaluation. This practice can be implemented along with or in place of the expert marking approach.

Although some students may interpret peer review as not meaningful to their learning (Rudd, et al., p. 331), peer review is "the standard mode of demonstrating the merit of research proposals and results (ELI, p. 1)." Peer review is an integral part of Science as it is how the quality of research is assessed. Consequently, engaging students in peer review activities is a practical way to expose students to the real world of scientific discourse where peer assessment is an expected part of the profession (Venables & Summit, 2003).

Peer Review Tools

A number of web-based tools exist to simplify the management of peer review activities for instructors. These tools include (but are not limited to): Aropä, developed at the University of Aukland; Calibrated Peer Review, developed at the University of California Los Angeles; iPeer, developed at the University of British Columbia; PeerMark, a component of the Turnitin plagiarism detection suite; peerScholar, originally developed at the University of Toronto; and SWoRD, developed at the University of Pittsburgh.

At the University of British Columbia, three web-based tools are currently supported for peer review: iPeer, PeerMark and Calibrated Peer Review. In this paper, Calibrated Peer Review will be explored in depth. In order to better understand the unique features of CPR, a brief overview of both iPeer and PeerMark is included below.

iPeer

Now widely used across the University of British Columbia, iPeer was originally was developed by the Faculty of Applied Science as a means for students to evaluate the contributions of their peers during group assignments. Development and support is now handed through the Centre for Teaching, Learning and Technology. In the 2010-2011 academic year, 92 new instructors and 4,372 new students were added to the UBC instance of iPeer. Over 200 new evaluations were added in the same time frame.

Unlike other peer review tools supported by UBC, iPeer is an open source web application that can be freely downloaded and customised. iPeer also includes unique features that allow instructors to create surveys as a means of assigning students to groups and to read student feedback prior to releasing it to the student being reviewed. iPeer supports rubric based evaluations, simple evaluations (where students assign their peers a numerical score) and a mix mode evaluation that combines both the rubric and simple evaluation options. More information about iPeer can be found at http://www.elearning.ubc.ca/toolkit/ipeer/

iPeer can be downloaded free of charge from http://sourceforge.net/projects/ipeer/files/ Requirements include PHP 4.0+, MySQL 4.0+ and an Outgoing SMTP Mail Server or Local SMTP Mail Server.

PeerMark

PeerMark, along with GradeMark and OriginalityCheck, is a component of the Turnitin Suite designed to prevent plagiarism and engage students. According to Turnitin, PeerMark "[e]ngages students in the writing process by providing structured, anonymous feedback of other student's written work (http://turnitin.com/en_us/products/turnitin-suite)." Instructors have the option to guide student feedback by asking both open ended and scaled questions which can be saved to a library for reuse. Instructors can also select how many papers the system will automatically assign to each student or allow students to self-select papers to review. Students view their peer's work directly within the Turnitin system and have the option to add comments directly on the paper.

Recent concerns regarding Turnitin's compliance with British Columbia's Freedom of Information and Protection of Privacy Act (FIPPA) prompted removal of a direct link to the system from within UBC's LMS. Further, there are now guideline's for the systems use that encourage students to use a pseudonym when creating an account with Turnitin. Despite these measures, the software is still widely used at UBC. There are currently over 1,200 instructors and 40,000 students within the system. However, Turnitin is used primarily for plagiarism detection and the PeerMark functionality has not been widely explored. As of August 2011, there were 241 papers from UBC in PeerMark.

Calibrated Peer Review

Calibrated Peer Review (CPR) was developed at the University of California Los Angeles under a National Science Foundation grant for curricular reform in chemistry. The initial design behind CPR was to enable the adoptions of frequent writing assignments in large enrolment courses in the Sciences. The project later received funding from the Howard Hughes Medical Institute and is now funded through a subscription based model, although a free version of the software is still available online at http://cpr.molsci.ucla.edu/. In May 2007, there were approximately 900 institutions and 140,000 student users (Russell, 2007). By 2009 had grown to 1,100 institutions and 4,400 courses (Rudd, et al., 2009).

Initially, the CPR system was completely hosted by UCLA. This allowed for the easy sharing of assignments across disciplines and universities. However, because student data was also hosted on the UCLA server, UBC was unable to implement the system without violating British Columbia's Freedom of Information and Protection of Privacy Act (FIPPA). When version 4 of the CPR system was announced, it offered institutions the ability to host their own data, enabling UBC to implement the system. Currently, the CPR system includes both a local server, where student data and work is stored, and a "Central" server, where assignments are stored and shared.

At present, CPR is used by over 1,300 students and 35 instructors at the University of British Columbia. The system is employed in the Biology, Chemistry, and Computer Science departments as well as in the First Year Seminar in Science courses. This includes100, 200, 300 and 400 level courses.

The student feedback included in this paper comes from a mid-term survey completed by students in the First Year Seminar in Science course during 2011 Winter Term 1. In this writing intensive course, students engage in the CPR process for 3 writing assignments. The feedback was gathered after the students' first interaction with CPR. Thirty-two students consented to share their feedback.

Calibrated Peer Review Process

When students first log into Calibrated Peer review, they are asked to view an online tutorial about the system and are required to pass a quiz before they can access assignments. This is designed to minimize misunderstandings and ensure students have a basic understanding of how the system works. Instructors are able to see who has passed the quiz, but are not able to view the quiz results. Students using CPR in multiple courses only need to pass the quiz once.

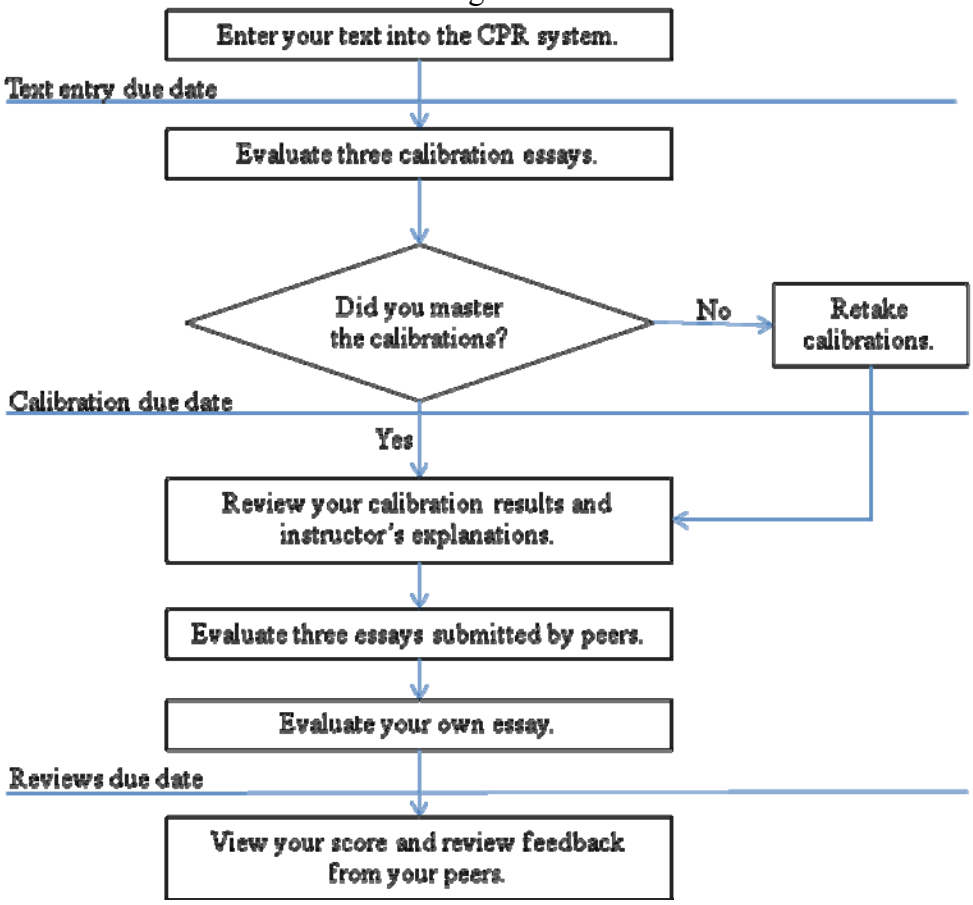
Each CPR assignment consists of three main stages: text entry, calibrations and reviews. Instructors must set both start and end dates for each of the stages. The dates for stages cannot overlap (i.e. the calibration stage cannot begin until the text entry stage has ended) but the text entry and review stages can be extended for individual student. The calibration stage cannot be extended. An overview of the Calibrated Peer Review assignment process is available in Table 1 below.

In the text entry stage, students enter their text into the system and are required to meet an instructor specified range for word count. This requires students to either type their text or to copy and paste from another application. Although this is a fairly simple step, the interface only supports hypertext markup language (HTML) for text formatting. This can be a barrier for students, particularly if instructors require specific formatting for references or citations. A new release of CPR, which has not yet been implemented at UBC, offers the option to upload documents instead of entering text directly into the system. If students do not enter their text into the system they can not participate in the rest of the process.

Unlike most systems that assume "individual peer markers could recognize high or low quality assignments (Pare & Joordens, 2008, p. 8)," CPR includes a calibration stage designed to help students learn how to differentiate between good and poor quality work. In this stage, students are asked to evaluate three essays that have been either selected or written by the instructor. These essays are intended to represent strong, moderate and weak essays. Students apply the marking rubric to the essays and, if their answers fall outside a specified deviation from the answers deemed correct by the instructor, students have the opportunity to re-evaluate the essays. In addition to providing students the opportunity to interact with the marking rubric, their results from this stage determine their Reviewer Competency Index (RCI) which will later be used to weight the marks they assign their peers.

In the reviews stage, students review three essays written by their peers as well as their own essay. These essays are assigned randomly by the system and the reviews are double-blind, although the instructor can determine both who reviewed a student's work as well as whose work a student reviewed. Instructors do not have the option to edit the number of reviews assigned to a student. While students use the same rubric for both the reviews and calibration stages, in the review stage the rubric also offers the option for students to provide open ended feedback. Once the reviews stage has ended, students have the opportunity to review their results and the feedback provided by their peers.

Table 1. Calibrated Peer Review Assignment Process



Scoring

A student's CPR score is based on four factors: the weighted average text rating of the text they submitted (based on each reviewers RCI, see Table 2 below), how many calibrations they mastered, the number of reviews they rated within the instructor specified deviations from the average text rating, and whether their self-assessment rating is within the instructor specified deviation range. The weighted average text rating is calculated using the following formula (see Table 2 for weight factors):

Weighted Average Text Rating =

Table 2. Reviewer Competency Index (Schimpf, 2010)

RCI	Number of calibrations passed		Average deviation of ratings	Resulting weight factor for student reviews
6	3	and	< 0.50 × dev	1.00
5	3	and	< 0.75 × dev	0.85
4	2 or more	and	≤ dev	0.70
3	2 or more			0.50
2	1 or more			0.25
1	0			0.00
0	variable			0.00

Instructors can determine how much each of the four CPR score factors is worth, as well as what deviation is acceptable for the calibrations, peer reviews and self-assessment. This scoring scheme allows for a large degree of flexibility in the scoring process. Instructors can chose to emphasize the text rating or the more participatory aspects of the CPR process.

Concerns

While peer review is widely used in English courses, use in the Sciences is still relatively rare (ELI, 2005). Perhaps because of this, students express a number of concerns with peer review including the fairness of the process, the value of the feedback provided, and the time required for peer review. Instructors express concerns as well, including the time required to create good peer review assignments, the quality of the feedback provided and whether students actually make revisions based on peer feedback.

According to a study by Rudd et al., 43% of students surveyed found the peer review process unfair. This is echoed in a study by Paré & Joordens (2008) who found that, although students "recognized the need for writing assessments in the course," there were "concerns with peer grading and its fairness (p. 13)." These concerns primarily emerge in courses where peer review is used in place of expert marking or where students perceive the marks assigned to peer review to be a large proportion of their grade.

In an effort to study both the fairness and validity of peer review marks, Paré & Joordens (2008) examined the relationship between peer and expert marks. They found that peer marks are slightly higher than expert marks and experts are more willing to give lower marks than peers (Pare & Joordens, 2008, p. 10). However, they also found "expert markers and peer markers have a tendency to agree on the quality of written pieces being marked (Pare & Joordens, 2008, p. 10). " This finding was echoed by Liang & Tsai (2010) who found that "self-assessment scores were not quite consistent with the expert's scores, but the peer assessment scores demonstrated adequate validity with the expert's evaluation. In particular, when the students had more rounds of peer assessment for reviewing the writing, the validity of the peer scores was enhanced."

Students may also question the value of the feedback provided by their peers (Nilson, 2003). This is often a complex issue, as it may be tied to an emotional response. For example, consider the comment below from a students in the First Year Seminar in Science course:

> After my initial anger wore off, I tried to put myself into their shoes to get a better understanding of how I can improve my work. Despite the majority of inaccurate criticisms, I found two reasonable ones that I used to make my paper better (even though I was aware of what needed to be fixed before CPR).

This student clearly had an emotional response to the feedback provided by peers. The feedback is described as "inaccurate" and even the value of the "reasonable" feedback is minimized. This criticism of peer feedback is not unique, yet it is surprising in class where 80% students reported they either agreed or strongly agreed with the statement "I am comfortable in receiving feedback from my peers in my writing" and 74% indicated the feedback they received was useful.

Another criticism students make of peer review is the time required for the peer review process. In the First Year Seminar in Science feedback, 34% of the students responding indicated that there was not enough time allocated the CPR process. While Rudd et al. (2009) found that students reported spending just over 2 hours on CPR, students in the First Year Seminar in Science report spending significantly more time with one student indicating the process took more than 7 hours. The most time consuming stage of the CPR process was peer reviews, followed closely by calibrations. 35% of students report spending between 61 and 120 minutes on peer review and 23% report spending more than 2 hours on this task.

Instructors also express concerns about the time required for peer review, specifically the time required to create good peer review assignments. Although Likkel (2012) reports that it only "takes a couple of hours to draft a CPR assignment and several more hours to carefully develop it," Rudd et al. (2009) indicates creating a good assignment can "require several days."

Creating an assignment in Calibrated Peer Review requires much more work than just conceptualizing and developing an assignment. Instructors must also develop a marking rubric, write or locate three sample essays and determine the "correct" markings for the sample essays. For the First Year Seminar in Science course, the marking rubric and sample essays were both developed over several weeks, tested by both students and faculty, and then revised.

Instructors have also been critical of the quality of the feedback students provide to their peers. Nilson (2003) found student feedback to be uncritical, superficial, inconsistent, inaccurate, harsh and unconstructive. Nilson also found that peer feedback focused on trivial problems, personal likes and dislikes instead of quality, and on personal agreement with the argument instead of logic or evidence (p. 35). Student feedback suffered from "the intrusion of student's emotions into the evaluative process, their ignorance of professional expectations and standards for various types of work, and their laziness in studying the work and/or in writing up the feedback (Nilson, 2003, 34)."

In addition, some instructors who use peer feedback as part of a write/rewrite process are critical of whether students actually incorporate peer feedback into their revisions (Nilson, 2003). In the First Year Seminar in Science course, 97% of students reported reviewing the feedback from their peers and the one students who reported not doing this indicated it was due to not knowing how to access the feedback. In addition, consider the two quotes below:

> "i [sic] really do take their feedback into consideration. oftentimes i [sic] suspect parts of my essay need to be reviewed and my peer's feedback just reassures my suspicions."

> "I tried to look at my essay from their point of view. If I felt that they were right, I would rewrite certain parts; if I felt that their comment didn't offer much insight, I would keep it the way I already had it."

While this hasn't been fully explored at UBC, the information above indicates than students review the feedback provided by their peers, consider it's value and implement the feedback when they feel it has value.

Discussion

There are a number of considerations for instructors interested in implementing peer review activities in their course. Assignments should be well planned and be meaningful in the course context (Rudd, et al., 2009). It is also important consider the amount of time required for peer review and how students will perceive the process. In addition, instructors using CPR, must carefully craft or identify calibration essays. "Ideally, past student responses should be used or modified for these calibration essays because it can be difficult to mimic student style and phrasing for misconceptions, and an instructor's writing style can allow students to perceive quickly the "right answer" – or what they think is the ideal answer – without critical analysis. (Rudd, et al., 2009)

Instructors should also explain to students the peer review process, its role in the academic community and the perceived benefits. Many students will not be familiar with peer review or understand the role peer review plays in the academic community (Rudd, et al., 2009). These students are likely to perceive peer review as "busy work" without clear value. As students begin to understand the role peer review plays in the academic community, they start to recognize their peers as a genuine audience and the feedback they provide becomes more meaningful (Nilson, 2003).

In addition, careful consideration should be given to the rubric and questions used to guide the peer review process. Experts, who have more complex reasoning patterns and better understand the role of peer review, may interpret the questions asked during peer review differently than students. Nilson (2003) found that many peer review questions were written in ways that evoked emotive responses from students. Students interpret these questions as asking them to find fault with a peer's work, not as an opportunity to help a peer improve their writing. When asked to pass judgement on a peer, many students will provide superficial or uncritical feedback (Nilson, 2003).

The format of questions may also impact the quality of the feedback students provide. Nilson (2003) found that when presented with Yes/No type questions students did not provide additional feedback, even when prompted. Students also struggled with questions that asked them to rate the validity of claims made by their peers. "[I]n the relativistic mind of the traditionally young undergraduate, one opinions may be as good as another, justified or not (p. 36)."

To address these issues, Nilson (2003) recommends writing peer review questions that require students to complete a task. For example, rather than asking a student to rate the thesis on a scale of 1-10, the student could be asked to restate the thesis in their own words. These activities require attention to detail and prevent skimming (p. 36). Questions should also be written to ask for personal reaction and not judgement. Appropriate questions for most students should focus on

the Bloom's taxonomy levels of comprehension and analysis, since most students are not yet expert enough thinkers to adequately reach the level of evaluation.

A number of studies indicate that the advantages of peer review extend beyond a reduction in instructor marking workload. The use of Calibrated Peer Review in particular has been found to correlate with a positive increase in the amount of content mastered (Rudd, et al., 2009) and students using CPR have showed greater gains in critical thinking and technical writing than students using traditional assignments (Heise et al., 2002). One study by Likkel (2012) found that CPR "positively influenced many of the students' perceptions of their ability to accurately assess what they have written (Likkel, 2012, p. 46)." Gunersel & Simpson (2009) found CPR to have a stronger impact on students who perform at lower levels with a specific impact on writing and reviewing skills. Clearly, peer review is a technique worthy of consideration.

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Securing Mobile Devices in the Enterprise

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Abstract

Mobile device security is an on-going concern when considering the usage of mobile devices within the corporate setting. The survey presented in the following paragraphs identifies the primary concerns as presented in current literature. In order to mitigate these concerns, the mobile security policy in terms of organizational remote access and functionality must be established. These policies must be implemented as close to the Operating System (OS) as possible. To demonstrate this concept, the usage of Microsoft's ActiveSync is investigated. This paper will be organized in the following manner: firstly, the background of mobile device security is examined to establish the validity of the usage of mobility within the workplace, secondly, various methods for security devices is investigated including authentication and encryption techniques.

Introduction

The globalization of human interaction has changed the way we think about mobility. Significant business, as well as personal, interactions occur via text messages, IMs, Social Networking, various types of remote connections, and cloud service providers. This borderless environment has been made possible by the introduction and improvements in the usage of mobile technology concepts.

With ongoing expansion of the mobile technology space, the lines defining mobility and mobile devices have become blurred. There is a fundamental change in perception; how 'we' view our devices. From the 'everyday' user point of view, the mobile device is perceived as being 'just my phone' or 'just my iPad' without regard to the actual capabilities of the device. As such, there is a less consideration of physical location as it impacts security, but instead on the context of the task, and technologies that are used to accomplish the task.

From a mobile application point of view, there is more focus placed on the social interactions, context of the application, as well as usage and usability. The device, as device, fades into the background for the user. The physical device has become as commonplace as a pencil, and is

often taken for granted because of this commonality. Given this ubiquity and invisibility, access and permissions are no longer considered. Mobile applications must be developed with security built into every layer in the technology stack, beginning with risk assessment: policy and trust model development thru to implementation, and even encompasses the post-implementation on-going risk assessment activities.

While security, from a mobile application perspective, is of critical importance to the overall security posture of an organization, the implementation model should be transparent to the person using the device or the application. This means that the person using the device should not need to consider settings, application usage, or the impact of co-mingled data on the device, for the device to be protected.

The establishment of the corporate policies in regards to mobility must the starting point for all implementations of a corporate security posture. Without a corporate policy in place, the corporation opens itself up to potentially unwanted legal action not only from users of the applications that have been installed on the device but also from shareholders demanding relief from real financial loss.

This survey paper will focus attention on the security policies as implemented at the Operating System level with attention paid to remote wipe and GPS location technologies.

Mobile Device Usage within the Workspace

According to Forrester Research (Forrester, 2011), the introduction of mobility produces complex security challenges for the organization. Not only is there a growing risk for IT administrators with the usage of personal mobile devices but also with those devices that are corporate issued but are used to manage personal, non-work related information.

Personal Mobile Device

Personal device usage within the corporate setting is associated with the increased risk. The adoption of the usage of the personal mobile device can be seen as a function of employee satisfaction, where the employee is afforded the decision to use their device of choice. With this concept, adoption is driven by the employee in a bottom-up approach rather than the by corporate directive, which results in a less secure environment. (Forbes, 2011)

To briefly outline the risks posed by the usage of personal mobile devices within the corporate setting, the following should be considered.

- By 2014, 90% of organizations will support corporate applications on personal devices (Gartner, 2011)
- Loss and theft are considered to be the greatest risk
- Devices fall in and out of compliance with industry as well as corporate standards
- How much control can an organization maintain over a device that is owned and funded by the individual?

- What over-arching regulations would apply to a data breach that involved a personal device given that there is an allowed co-mingling of corporate and personal data?
- Sharing the device with outside parties can be expected
- How do you segregate corporate data from persona data and how do you protect the critical data?
- Can you legally prevent a person from 'Jail Breaking' their owned/operated device?

Corporate Devices

While the issuance of a corporate owned device can be more secure, it is not without its own risks. Both policy and configuration can add additional control, removing some concerns which attach to the personal device.

One of the pressure points in the appropriate balance of security versus usability comes by way of adoption and usage of corporate controlled devices. While they are more secure, they are typically far less flexible, and create an environment where the end user often finds themselves carrying multiple devices, and then requesting access (beginning with email) for their personal devices, thereby bringing the issue full circle. There is also an impact to the productivity of the employees who must constantly monitor and respond to multiple devices. Alternatively, the employee begins to use the corporate device for personal use, creating the same co-mingling of data identified above.

While the corporate issued device can be an ideal situation in circumstances of highly private data, such as with law enforcement, it is not necessarily appropriate for all instances given issuance can result in an expected proportional increases in corporate expenses in terms of devices issuance, replacement and recycling, communication provider services as well as device management.

Implications of Mobility within the Workplace

One primary area of concern for the IT security administrators is in the device configuration settings. Typically, the personal device does not conform to organizational security standards, or the corporate issued device is altered, through configuration or "jail breaking", to allow more functionality than what was intended. The IT security team has two options available to confront this concern: 1) there can be a demand that all devices conform to the security standards via the establishment, communication and enforcement of corporate security policies on mobility, or 2) the organization can choose to take on the risks associated with what is unknown in the mobile environment.

In addition to the concern of usage and conformance, Forrester (2011) identifies and ranks four (4) primary areas of risk that must be addressed by the corporate risk models as well as policy development:

- Theft and lost
- Threats to data protection
- Malicious insider attacks

- Data Stealing malware - Root the device to bypass local security

In order to circumvent the risks posed above, Forrester (2011) suggests the following areas of improvement in the mobile security environment.

- Policy development
- Risk/Benefits analysis – Identification of the risk posture of the organization
- Deployment of solutions based on risk analysis and the resulting security policies that specifically address the usage of mobile devices within the organization

Further, in a study conducted in 2011 Carnegie Mellon University (CMU) in conjunction with McAfee Security Systems (2011) several startling facts were uncovered in terms of organizational security awareness when considering the mobile computing environment.

- Of the 150 organizations surveyed, 95% of organizations have a mobile security policy in place; however it is viewed as ineffective, given that the policy is not widely known to the corporate community.
- Additionally, of those surveyed, most did not know how to set the security settings, (permissions and access controls) on their devices.
- In terms of data co-mingling, 63% of those surveyed used their corporate devices for personal use as well.
- 40% of the 150 organizations surveyed experiences theft and loss of a mobile device with more than half of those lost/stolen containing business critical data where 1/3 of those had a financial impact on the organization.
- Following the loss or theft of a mobile device, 10% did not increase their security posture because of budgeting issues even though there was concerns related to
    - Introduction of malware to the network
    - Sharing of data with unauthorized entities
    - Risk imposed by user behavior (lack of backup, storing logon information, etc.)
    - 1 in 3 devices are keeping confidential information

Overview of Security Methods

The responsibility of protecting the data as maintained by an organization is the organization itself. Mobile devices are no exception to this; and quite often present a larger threat surface than traditional PCs. With PC's, many robust solutions exist to ensure proper authentication and encryption capabilities are in place . *Authentication* is the process of verifying that a user is who they say they are while *encryption* involves ensuring only authorized people have access to the data regardless of the location of the data or who possess it. While Active Directory, BitLocker, and TrueCrypt have been used by organizations to secure PCs, these traditional mechanisms are not an optimal solution for mobile devices. Research indicates that users of mobile devices perceive the need for security but lack confidence in the current implementation . Layered into the environment that mobile devices are often purchased by individual as opposed to the organization, the environment becomes more complex with respect to policy enforcement. This section

will examine the current protection methods available to mobile platforms that can be employed to satisfy Information Assurance concerns.

Authentication

Proper authentication of users is a fundamental concept in Information Assurance. Ideally, the '*triple-A'* paradigm is followed; Authentication, Authorization, and Accounting. Authentication systems identify who is accessing the systems. Authorization systems determine if a user is able to access a particular resource; i.e. read permissions on a file. Accounting systems are responsible for tracking user movement throughout the system while actively logged in; i.e. logging functions. Robust "*triple-A*" systems have been extensively developed and are being used effectively . The question that needs to be addressed is whether these methods will scale to the mobile domain while supporting the same level of authentication that is often required by mandate or law.

As noted above, the inherent portability of mobile devices creates a serious security concern. Authenticating the user of the device is often seen as a first line of defense. All major mobile device platforms support password based authentication and as such, passwords are the most common method of user identification. At the present time, smart cards and other two factor authentication techniques that are employed on laptops are not supported on the current generation of mobile devices. However, many researchers are actively working in this area as is presented by Ben-Asher, et al. (2011). In the study presented by Ben-Asher et al. (2011), research is presented to enable the touch screens as found on many tablet and hand-held devices to function as a fingerprint reader which can create an environment where every touch of the screen has the potential to authenticate a user.

Policy issues also arise when attempting to apply corporate security policies to privately owned devices. Many consumers who purchased their own mobile device do not password protect it. A recent survey of IT practices at a large institution uncovered confusion about this topic. Comments like "... implement(ed) a policy that took over all mobile devices ..." and "Do not take over my mobile device!!!" serve to demonstrate the sensitive nature of this area .

Sensitive political issues aside, technology exists that will aid in authentication enforcement by the organization. Exchange Server 2010 can be used to push mobile device policies to any user who chooses to use ActiveSync. ActiveSync is the Microsoft technology that enables the communication between any device and the Exchange Server. Currently Apple's iOS, Google's Android, RIM's BlackBerry OS, and Microsoft's Windows Phone 7 all support the ActiveSync protocol. It is important to note that there are minor differences between the implementation of some of the setting in ActiveSync and the various Operating Systems. For example, Apple's iOS has a minimum password or 4 digits while Android devices ignore this setting and configure a default password length of 4 digits. Table 1 identifies representative information of the authentication related settings as found in the ActiveSync configuration while figure 1 depicts the relationship between an Exchange Server running ActiveSync and the mobile device:

ActiveSync Setting	**Description**
AllowSimplePassword	Enable use of simple passwords - i.e. abcd or 1234

PasswordRequired	Mandates the use of a password for the device
IdleTimeoutFrequencyValue	Time allowed to enter password
MinPasswordLength	Sets default password length - i.e. 7 characters

Table 1. Mobile device settings in ActiveSync pertaining to authentication

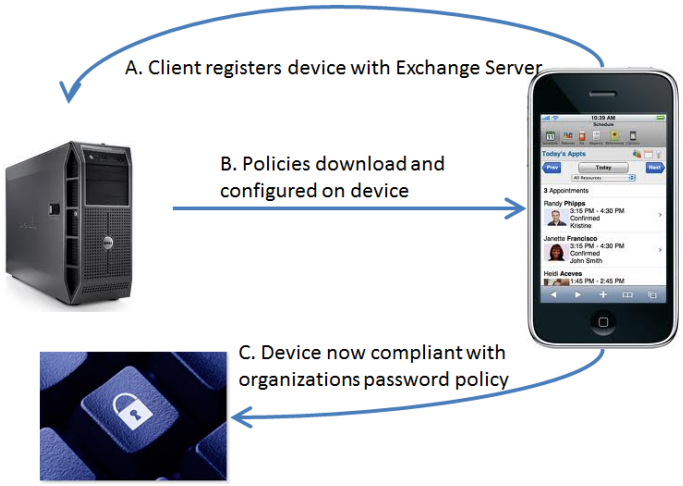

Figure 1. Relationship between mobile device and Windows Exchange Server

To prevent subversion of the password policy, a device wipe threshold may be configured on mobile devices. This threshold prevents an attacker from executing a brute attack toward the passwords as stored the device. This is especially beneficial if a four digit password is used. After an attacker attempts ***X*** incorrect password guesses, the mobile device automatically erases itself. This setting can be particularly difficult to enforce on private devices. For example, if threshold = 10 and a child mistakenly enters a password incorrectly 10 times, the device is wiped. So caution is recommended when evaluating this setting and communication about its functionality to the users is paramount.

Encryption and Mobile Device Management (MDM)

Robust authentication systems will enhance the security of mobile devices by preventing unauthorized users from accessing data on the system. Technology currently exists where an assailant can connect a device to a PC and directly copy the data from the device (Cellebrite, 2012). Extracting the data from a device is a common practice within the PC domain to accomplish various Information Technology tasks. This practice is often used for negative purposes as well. For example, in the event that a laptop is stolen, the unauthorized entity can simply remove the hard drive and attach it to another machine in order access the stolen data. To prevent this type of unauthorized access, data encryption is often used . In summary, encryption is the process whereby a key (some randomly selected value) and the data to be encrypted are supplied to a mathematical algorithm which renders the data masked. In order to decrypt the data for some purpose the chosen key and encrypted data must be supplied to the decryption algorithm. Utilization of this methodology of masking would aid in the prevention of data disclosure should the device be in the possession of an unauthorized user.

The challenge present in the mobile environment, unlike PCs, is that mobile devices dominated by four major operating systems (OS); Android, Apple's iOS, BlackBerry, and Windows Phone 7. Each of the operating systems has various support for different encryption algorithms as demonstrated in Table 2.

OS	Encryption	Notes
Android	128/256 AES	Minimal support through ActiveSync - varies greatly by OEM (HTC, Motorola, etc). Use of 3rd party software recommended.
BlackBerry	256 AES	Full policy support through BlackBerry Enterprise Solution
iOS 5	256 AES	Full policy support through ActiveSync
Windows Phone 7.5	NA	Does not support device encryption

Table 2. Mobile device encryption properties by OS

Additionally, as noted above, many devices are not purchased by the organization which may pose concern for the owner of the device if organization encryption is enforced. A larger security issue presented when considering sensitive email and text messages that are delivered to the device via a push communication methodology. In this environment, should the device be rendered lost or stolen, non-encrypted data will become vulnerable to unauthorized disclosure or leakage.

Using device encryption is not without its own challenges. If a user forgets their password there should be a mechanism to recover it without losing the data. Of the three devices that support device encryption from Table 2, BlackBerry has the most comprehensive solution (BlackBerry, 2012). Figure 2 demonstrates the Web Desktop Manger that a user can use to reset their password or perform a remote wipe of a lost or stolen device.

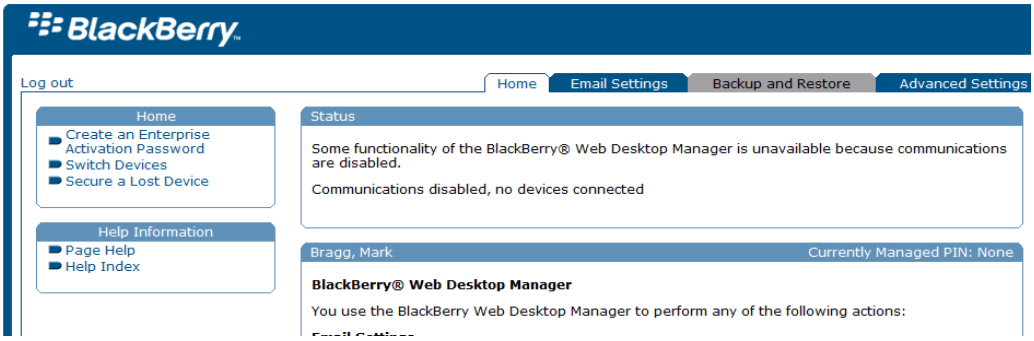

Figure 2. BlackBerry Web Desktop Manager.

Android, iOS, and Windows Phone 7 devices currently do not support enterprise level password recovery or reset. This can present a problem when enforcing password policies without providing a mechanism to reset the password. Without a policy to reset the mobile device passwords, the technology department is restricted to a full device wipe/reset which renders the device back to its factory state. Additional consideration for digital forensics when using mobile device encryption needs to be considered. If a device is involved in an action that requires further investigation, encryption may cause recovery complications .

Information Technology (IT) departments currently use various mechanisms to protect data that is stored on a mobile device. Requiring passwords, device encryption, and policies pushed from an Enterprise Environment such as Microsoft Exchange Server with ActiveSync or a BlackBerry Enterprise Server aid in this process (BlackBerry, 2012; Microsoft, 2012b). A common problem with the security of mobile devices is their high degree of portability combined with a high loss/thief rate. As noted in the NSW study of 2001 as well as the Unit study of 2011, in the United Kingdom these types of events accounted for half of all street crime which saw a 50% increase in New South Wales . With the high rate of loss associated with mobile devices, remote mobile device management becomes an increasingly important security aspect within an enterprise setting. This section will further discuss the capabilities of ActiveSync and BlackBerry Enterprise Server to support remote wipe and mobile device management by way of the GPS location tracking feature.

Remote Wipe

When a user is no longer in physical possession of their device or the employee is no longer a member of the organization, is it often advantageous to erase the contents of the device to ensure the protection of the data item as well as the backend systems that are accessible with the mobile device. In both circumstances, the ability to remotely erase, (aka wipe), the information stored on the mobile device is an importance security precaution. The ability to manage the device in this fashion should be addressed within the security policies and procedures related to the usage of a mobile device within the organizational setting.

As demonstrated in the BlackBerry Web Desktop Manager in Figure 2 and Outlook Web Access in Figure 3 and 4, both solutions enable remote wipe of mobile devices as well as to give visibility to the details of the device. When a device is synchronized to an Exchange Server, should a remote wipe action is invoked, all Exchange Server information will be removed from the device . Similarly, BlackBerry Enterprise Server contains functionality with remote wipe capabilities. Microsoft Windows Phone 7.5 does not support remote wipe capabilities as it is currently marketed toward the consumer . A discussion of beta features of Windows Phone 8 will be presented as this study progresses.

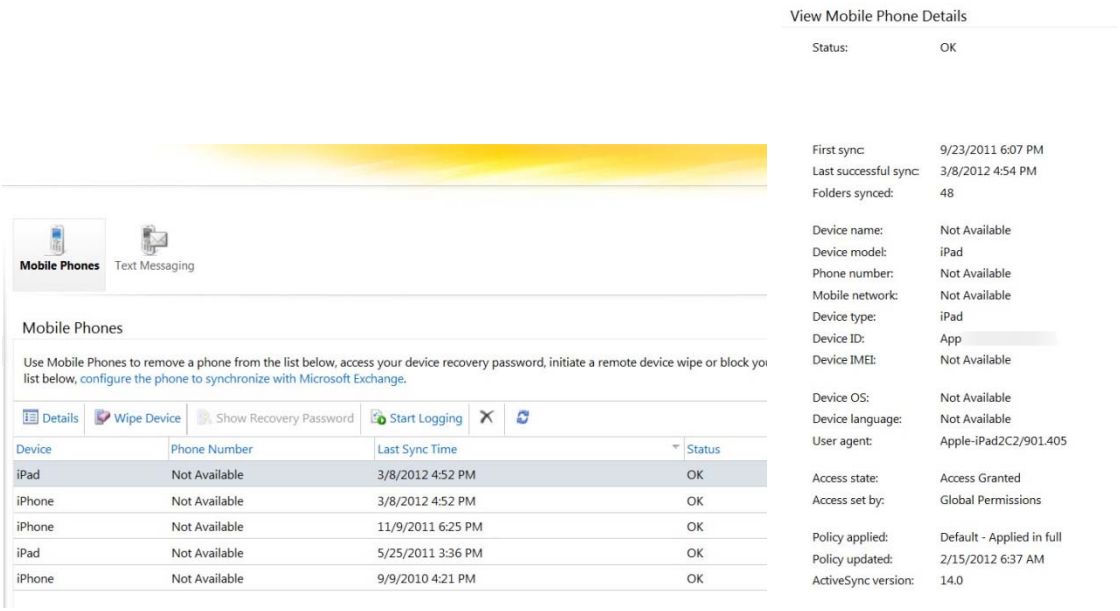

Figure 3 and 4. Outlook Web Access interface for remote administration and device detail information.

Remote wiping is dependent upon the implementation of the feature by the manufacture of the operating system. For example, Apple's iOS 5 operating system for iPhones and iPads, the remote wipe feature does not securely delete the data. Rather the feature as implemented by Apple erases the encryption keys which in effect render the data inaccessible. Currently there is no know technique to subvert this implementation (Apple, 2012a). The data is still resident on the device in its encryption form which may become exposed with more sophisticated information recovery techniques.

Regardless of how remote wipe functionality is implemented, in order for the command to be processed, the device must connect back to the control server in order to receive it. Should the untrusted entity disable communications to the device by using either the Airplane Mode of the device or by placing the device in a Faraday Bag, the remote wipe command is never received and the potential for data loss increases. To combat this, as noted above, a device wipe threshold can be implemented within the device's security settings to diminish the success of a brute force password attack. For example, the default settings for a BlackBerry device allow for 10 password attempts before the wipe function is triggered. This threshold functionality further supports the security of mobile devices.

GPS Location Tracking

When a mobile device is no longer in the possession of the owner, remote wiping can be considered to be a viable option for securing sensitive data that is stored on the device. This will not, however, aid in physically recovering the device. To bridge this gap, "*find my phone*" applications can be used. Usage of this form of application enables the device owner to activate the GPS chip on the device and have it record its current location.

The "*find my phone"* feature is supported across all four major mobile platforms but is implemented in vastly different ways. For example both Windows Phone 7.5 and Apple's iOS 5 support location tracking within the operating systems . BlackBerry and Android operating systems

utilize applications that users can install on their devices to accomplish the same end result. Many of these services have been tested and feedback is positive (CNet, 2012). The GPS location can be returned via a web interface, email, or text message that contains relative information about the location of the missing device.

Location tracking will provide institutions the ability to locate misplaced or stolen devices. All of these location tracking services offer interfaces for users to locate their own or assigned devices. This has the potential to empower end users in combating device thefts and will hopefully cause a decrease in lost devices.

The Future State of Beta OS with MDM Capabilities

Any discussion of unannounced features or those found in beta or pre-release software is often unreliable. However, with the announced release of Windows Phone 8 in the second half of 2012 along with System Center 2012 Configuration Manager the following information is credited as being reliable (Microsoft, 2012b). The remaining mobile operating systems that will be considered in the remainder of this section have not released information that would indicate an increase mobile device management.

With the increased security aspects expected in the pending release of Windows Phone 8, the operating system can be considered to be an enterprise level technology. According to Microsoft tech pundit Paul Thurrott, Microsoft is planning on bringing the well-established enterprise level whole drive encryption solution, BitLocker, to the mobile platform . The BitLocker technology is currently available on the enterprise editions of both the client and server platforms. This further provides for a unified management approach to data encryption.

To further enhance mobile device management, System Center 2012 Configuration Manager (SCCM) will be released during the third quarter of 2012 (Microsoft, 2012b). SCCM supports the integration of mobile device management at the enterprise level with a higher degree of integration with Windows Mobile devices. As is often the case, enterprise management with other mobile operating systems is highly dependent upon implementation within those ecosystems. It should be noted that lacking enterprise support natively with the OS does not preclude the management capabilities. Third party solutions have been developed to support the environment and functionality needed for cross-device management . The downside of this approach is the required installation of the third party application on all managed devices. Because of this limitation, seamless integration as found with BlackBerry or Windows Phone 8 will not be possible.

Conclusions

As can be seen, mobile security is a very real proposition for any organization which will either use or allow usage of mobile devices within their operations. Mobile malware affects not only the traditional end user, but as we move to the usage of mobility in the workplace, this type of event will ultimately impact the organization as a whole. This subsequently will have a significant negative impact on the profitability and brand identification of the organization.
Security of mobile devices and its utilization within the corporate setting should begin with establishing the policies of the organization in terms of usage and responsibility.

Future research will encompass establishing a simulated enterprise mobile environment using Amazon's Web Service (AWS) environment whereby the mobile device will be observed to determine its reaction and effective usage with ActiveSync when invoking remote wipe, location tracking as well as other utilities in an attempt to support mobile device management. The results from this on-going research will be distributed via subsequent publications.

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Effectively Communicating with University Students Using Social Media: A Study of Social Media Usage Patterns

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Abstract:

Social applications such as Facebook, YouTube, and Twitter have driven the expansion of the Internet and made technology part of most students' daily life. Universities and colleges are using social media to reach student prospects, keep contact with current students and alumni, and provide a mechanism for group collaboration and interaction in the classroom. Higher education institutions are influenced by current social media trends, and figuring out how to effectively interact with various constituencies within the social media environment can be challenging.

A two-pronged study was conducted to assess contemporary social media best practices within higher education. Over 100 college and university web sites were studied to determine the institution's participation in and promotion of official organization-related social media channels. A study of the characteristics of computing students and students within other concentrations was conducted to evaluate social media practices and preferences with a focus on higher education-related activities. The goal was to determine what aspects of social media were most effective in reaching various student groups based on social media usage patterns. Four hundred students participated in the study. The results from both phases of the study led to significant observations that can aid in the development of social media tactics to reach university and college students. Developing an effective social media strategy can not only help programs, departments, and colleges, but also individual instructors.

Introduction

The popularity of the Internet among members of the Millennial Generation--those with birth dates from the late 1970s to the late 1990s--has produced an emphasis on social media networks as tools for promoting both interpersonal and institutional communication. In 2008, the Pew Research Center for the People and the Press reported, "Two-thirds of Americans age 18-29 say they use social networking sites." (Kohut et al. 2008). More than 40% of respondents ages 18 to 29 reported getting information on the presidential campaign from the Internet, the highest of any news source, with Facebook and MySpace being the most used sites. This figure was more than doubled from the January 2004 results (Kohut et al. 2008).

Tools that promote Internet-based user collaboration, social interaction, and rich user interface engagement are a major element of what various authors refer to as Web 2.0. Web 2.0 is described by San Murugesan as "the wisdom Web, people-centric Web, participative Web, and read/write Web. It's a collection of technologies, business strategies, and social trends" (Murugesan 2007). Social applications like Blogger, Wikipedia, Facebook, YouTube, and Flickr have driven the growth of Web 2.0. At the end of September 2009, almost ninety million citations appeared in a Google search for the term "Web 2.0." That was an eighty million jump from Tim O'Reilly's 2005 article, "What is Web 2.0". (O'Reilly 2005)

In "The Use of Social Media in Higher Education for Marketing and Communications: A Guide for Professionals in Higher Education," (2008) Rachel Reuben, Director of Web Communication and Strategic Projects at the State University of New York at New Paltz, describes common uses of social media in higher education. She based her analysis on a survey of 148 colleges and universities regarding their use of social media to reach target audiences. Reuben verified Facebook, YouTube, Flickr, and blogs as common social media tools used by higher education institutions (Reuben 2008).

In November 2007, Facebook initiated a fan page feature that allowed universities and companies to post material under their official business names on Facebook. Fan pages are similar to user profile pages except that they usually allow anyone to view the page. By January 2008, 420 universities were using the fan page feature. More than half of the respondents in Reuben's survey maintained a Facebook page for their college or university with "85% of students at four-year universities" having a Facebook profile (Reuben 2008). When someone becomes a site's fan, this shows on his or her personal profile as a link to that site's page. The subsequent displaying of these links to a user's Facebook friends acts as a viral marketing tool. Facebook, moreover, is free to colleges and universities and allows organizations to target specific networks or age groups. Reuben ranked Ohio State University's (OSU) Facebook site as one that exemplifies best practices for social media marketing (Reuben 2008). OSU created its Facebook fan page in November 2007. In October 2009, this page had 47,460 fans.[1] The University of California, Berkeley, was described by Reuben as "one of the most well-known channels and volume of subscribers on YouTube in higher education" (Reuben 2008). In August 2008, Reuben reported that the UC Berkeley channel had almost 2 million views. On October 20, 2009 this number had reached 2,570,028 channel views.[2] UC Berkeley also maintains YouTube profiles for events, campus life, and athletics with 147,919 views, 72,343 views, and 31,168 views respectively.[3]

Blogs are used by colleges' and universities' current students. More than 60% of the survey's respondents reported some use of blogs on their site. Students use blogs to discuss their lives on campus. Admissions officers use student blogs and administrator created blogs as recruiting tools. Butler University's blogs and forums generate 30-40% of their external Web site traffic in one month (Reuben 2008). Butler started with 10 bloggers in 2007-2008; as of October 2009 there are twelve. Eight of these twelve are student bloggers, one is a guest blogger, another is the school mascot, and two are admission counselors.

1 Ohio State University Facebook Fan Pages search on October 20, 2009
2 UC Berkeley YouTube channel views as of October 20, 2009
3 UC Berkeley YouTube channel views as of October 20, 2009

Higher Education Participation in Social Media

Universities and colleges are creating social media profiles to reach new prospects and to stay in contact with current students and alumni. A study was conducted to find what content and practices motivate university students to join and participate in university-oriented social networking. As a preliminary part of this study, two universities/colleges were chosen from each state in the U.S. (typically the top two state universities in each state). Each school's website was searched for links from its home page and its prospective student page to any social media site presence operated by the university. Those social media links were visited and the number of accounts (i.e. university administration, university housing, university athletics, etc.) connected to each social media tool were tallied and compared to other schools. Additionally, the different types of social media tactics (i.e. using custom applications in Facebook, offering free merchandise through Twitter, and etc.) were noted. This information was used as background to assist in the development of questions to be asked of university students with the purpose of finding out how college students are currently using social media tools and what can be learned from their use of social media.

Of the 100 university sites visited, 52 had some type of link to a university presence on a social media site. Of these, 49 had links to Facebook, 40 had links to Twitter, and 38 had links to YouTube.

The second part of the study utilized a printed survey distributed to undergraduate and graduate university students. This Social Media Survey asked research participants about their use of features in social media networking websites. This survey consisted of a variety of social media questions and could be given to any member of the target audience. It contained forty-one questions about the participants' current social media uses and preferences for future social media developments. The survey was completed by 366 undergraduate and 28 graduate university students as shown in Table 1.

Table 1: Class Classification Frequencies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Freshman	116	29.0	29.4	29.4
	Sophomore	63	15.8	16.0	45.4
	Junior	73	18.3	18.5	64.0
	Senior	114	28.5	28.9	92.9
	Masters	28	7.0	7.1	100.0
	Total	394	98.5	100.0	
Missing	No response	6	1.5		
Total		400	100.0		

Approximately 40 percent of the participants were female, 60 percent male. In light of the sample used, students enrolled with a computing-related degree represented 35 percent of the study participants; communications students represented 19 percent of the participants. Over thirty different programs of study were represented in the sample.

Several questions were to be examined in the results:

- Does student classification have a role in social media usage patterns? (i.e. Do freshmen use social media differently than seniors or graduate students?)
- Do men use social media differently than women?
- Do computing students use social media differently than students in other programs?
- What university-oriented activities do students participate in within social media?

Appropriate statistical tests were used to examine various dimensions of the above questions.

General Results of Interest

The Pew Research Center survey on Generation Millennial found that three-quarters of its respondents had created a profile on a social networking site (Lenhart, et al. 2010). The results collected in this survey parallel that data. When asked to rank their most used social media site, almost 80 percent of respondents indicated Facebook as shown in Table 2.

Table 2: Most Used Social Media Tool

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Blog	2	.5	.5	.5
	Facebook	314	78.5	78.5	79.0
	Google Buzz	1	.3	.3	79.3
	LinkedIn	3	.8	.8	80.0
	MySpace	10	2.5	2.5	82.5
	Podcasts	2	.5	.5	83.0
	Twitter	6	1.5	1.5	84.5
	YouTube	31	7.8	7.8	92.3
	Wikis	3	.8	.8	93.0
	Other	5	1.3	1.3	94.3
	Not Applicable	23	5.8	5.8	100.0
	Total	400	100.0	100.0	

Join University Social Media Group

What would lead a student to join a social media site sponsored by a university? If a university wishes to increase membership of its social media networks, then university officials in charge of maintaining social media outlets need to know the best way to advertise its presence in social media to students. In the Social Media Survey, respondents were asked to select the options they would use to join a social media site that is approved by their University (see Table 3). Survey respondents unexpectedly rated the option of their likelihood of joining a social media site from advisor, professor, and student invites the highest.

Table 3: Method of Joining a Social Media Site

		Responses	
		Yes	No
Method of Joining a Social Media Site	Invite from a department advisor/professor	215	185
	Invite from a fellow student	285	115
	School homepage (www.etsu.edu)	122	278
	Department page (www.cs.etsu.edu)	99	301
	Posters, signs, orientation booklets	102	298
	Other	14	386

Role of Gender, Classification, and Program of Study

Does a student's gender, classification, and/or program of study influence how they use social media? In a survey question not presented here, it was determined that posting comments and friends' walls and updating one's own status were the two most common social media activities. (Over 55 percent of participants indicated they did this "frequently" or "often.") The results from this question were divided by classification, gender, and program of study to see if any factor was statistically significant as a contributing factor. The computed outcome indicated that classification was not a statistically significant determinant of activity. No difference in activity based on classification was observed. Gender, however, was a statistically significant determinant. Female students are more commonly active in posting activities than male students. To assess the program of study question, students were grouped into two categories: those pursuing a computing-related degree and those pursuing a non-computing-related degree. The difference between these two groups was statistically significant. Computing students use and participate in social media at a higher rate than the general student population in other programs.

Interaction with Course Instructors within Social Media

Participants were asked to rate their level of interaction with course instructors online within social media. Specifically they were asked to rate their frequency of viewing course work tips posted by instructors within social media using the choices frequently, often, sometimes, rarely, and never. Participants were asked to make this rating based on actions they had undertaken or would undertake if this option were available. There was a high rate of frequency for those responding to "frequently or often viewing tips posted by instructors on course work." Of the 400 survey respondents, 77% would interact with instructors by viewing tips posted on course work. Only 2.5% responded never. The frequency of responses is shown below in Table 4.

Table 4: View Tips Posted by Instructors on Course Work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Frequently	153	38.3	38.5	38.5
	Often	153	38.3	38.5	77.1
	Sometimes	67	16.8	16.9	94.0
	Rarely	14	3.5	3.5	97.5
	Never	10	2.5	2.5	100.0
	Total	397	99.3	100.0	
Missing	No response	3	.8		
Total		400	100.0		

When examining the above results to differentiate between classification, gender, and program of study, only gender shows a statistically significant difference, with female students more likely to interact with instructors online in this manner.

Participants were asked to rate their expected frequency of communicating with instructors and asking questions within social media using the choices frequently, often, sometimes, rarely, and never. Of the 400 survey respondents, 62.9% would interact frequently or often with instructors by communicating and asking questions. Only 4.0% responded never. The frequency of responses is shown below in Table 5.

Table 5: Communicate with Instructors and Ask Questions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Frequently	105	26.3	26.4	26.4
	Often	141	35.3	35.5	62.0
	Sometimes	110	27.5	27.7	89.7
	Rarely	25	6.3	6.3	96.0
	Never	16	4.0	4.0	100.0
	Total	397	99.3	100.0	
Missing	No response	3	.8		
Total		400	100.0		

When examining the above results to differentiate between classification, gender, and program of study, none of the factors demonstrated a statistically significant difference.

Interaction with Group Project Colleagues and Fellow Students within Social Media

Participants were asked to rate their expected frequency of communicating with classmates and asking questions using the choices frequently, often, sometimes, rarely, and never. Of the 400 survey respondents, 58.4% would interact frequently or often with classmates by asking questions and communicating. Only 3.0% responded never. The frequency of responses is shown below in Table 6.

Table 6: Communicate with Classmates and Ask Questions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Frequently	102	25.5	25.7	25.7
	Often	130	32.5	32.7	58.4
	Sometimes	114	28.5	28.7	87.2
	Rarely	39	9.8	9.8	97.0
	Never	12	3.0	3.0	100.0
	Total	397	99.3	100.0	
Missing	No response	3	.8		
Total		400	100.0		

When examining the above results to differentiate between classification, gender, and program of study, none of the factors demonstrated a statistically significant difference.

Participants were asked to rate their expected frequency of uploading and viewing group documents and/or files using social media tools using the choices frequently, often, sometimes, rarely, and never. Of the 400 survey respondents, 39.5% would interact often with a feature offering the capabilities to upload and view group documents and/or files. Only 3.0% responded never. The frequency of responses is shown below in Table 7.

Table 7: Upload and View Group Project Documents/Files

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Frequently	108	27.0	27.2	27.2
	Often	157	39.3	39.5	66.8
	Sometimes	99	24.8	24.9	91.7
	Rarely	21	5.3	5.3	97.0
	Never	12	3.0	3.0	100.0
	Total	397	99.3	100.0	
Missing	No response	3	.8		
Total		400	100.0		

In examining potential statistically-significant differences based on classification, gender, or program of study, only gender exhibits a statistically-significant variation. Male students use this option more than female students.

Participants were also asked to rate their expected frequency of communicating with group members via real-time chat using the choices frequently, often, sometimes, rarely, and never. As expected, there was a high rate of frequency for those responding to "frequently or often communicating with group members via real-time chat." Of the 400 survey respondents, 54.4% would frequently or often interact with group members via real-time chat posted about coursework. Only 7.1% responded never. The frequency of responses is shown below in Table 8. Responses to this question were not statistically different based on classification, gender, or program of study.

Table 8: Communicate with Group Project Members via Real-Time Chat

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Frequently	106	26.5	26.7	26.7
	Often	110	27.5	27.7	54.4
	Sometimes	98	24.5	24.7	79.1
	Rarely	55	13.8	13.9	92.9
	Never	28	7.0	7.1	100.0
	Total	397	99.3	100.0	
Missing	No response	3	.8		
Total		400	100.0		

Participants were asked to rate their expected frequency of using social media for meeting new incoming students within their major using the choices frequently, often, sometimes, rarely, and never. There was a high rate of frequency for those responding to "rarely or never meeting new incoming students within major." Of the 400 survey respondents, 35.1% would not use a social media tool to meet new incoming students within a major. Only 12.6% responded frequently. The frequency of responses is shown below in Table 9.

Table 9: Meet New Incoming Students within Major

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Frequently	50	12.5	12.6	12.6
	Often	87	21.8	22.0	34.6
	Sometimes	120	30.0	30.3	64.9
	Rarely	102	25.5	25.8	90.7
	Never	37	9.3	9.3	100.0
	Total	396	99.0	100.0	
Missing	No response	4	1.0		
Total		400	100.0		

Participants were asked to rate their expected frequency of using social media for communicating with department graduates using the choices frequently, often, sometimes, rarely, and never. There was a high rate of frequency for those responding to "rarely or never communicating with department graduates." Of the 400 survey respondents, 40.8% would not interact with department graduates. Only 9.9% responded frequently. The frequency of responses is shown below in Table 10.

Table 10: Communicate with Department Graduates

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Frequently	39	9.8	9.9	9.9
	Often	60	15.0	15.2	25.1
	Sometimes	135	33.8	34.2	59.2
	Rarely	120	30.0	30.4	89.6
	Never	41	10.3	10.4	100.0
	Total	395	98.8	100.0	
Missing	No response	5	1.3		
Total		400	100.0		

Learning about Courses and Offering Feedback

Participants were asked to rate their expected frequency of learning about elective or special courses within a major using the choices frequently, often, sometimes, rarely, and never. There was a high rate of frequency in the middle ranges of options. Of the 400 survey respondents, 34.3% would often use a social media feature to learn about elective or special courses within their major. Only 5.6% responded never. The frequency of responses is shown below in Table 11.

Table 11: Learn about Elective or Special Courses within Your Major

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Frequently	70	17.5	17.8	17.8
	Often	135	33.8	34.3	52.0
	Sometimes	116	29.0	29.4	81.5
	Rarely	51	12.8	12.9	94.4
	Never	22	5.5	5.6	100.0
	Total	394	98.5	100.0	
Missing	No response	6	1.5		
Total		400	100.0		

Participants were asked to rate their expected frequency of learning about courses offered from instructors using the choices frequently, often, sometimes, rarely, and never. There was a high rate of frequency for those responding to "often or sometimes learn about courses offered from instructors." Of the 400 survey respondents, 65.3% would interact often with a tool to learn about courses offered from instructors. Only 4.3% responded never. The frequency of responses is shown below in Table 12.

Table 12: Learn About Courses Offered from Instructors

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Frequently	76	19.0	19.4	19.4
	Often	138	34.5	35.2	54.6
	Sometimes	118	29.5	30.1	84.7
	Rarely	43	10.8	11.0	95.7
	Never	17	4.3	4.3	100.0
	Total	392	98.0	100.0	
Missing	No response	8	2.0		
Total		400	100.0		

It is interesting to note that students are much more likely to learn about new courses offered within social media when that communication comes directly from the instructor.

Participants were asked to rate their expected frequency of anonymously posting feedback on a course using the choices frequently, often, sometimes, rarely, and never. There was a higher rate of frequency for those responding to "frequently and often anonymously posting feedback on a course." Of the 400 survey respondents, 46.1% would interact frequently or often with a tool to anonymously post feedback on a course. Only 9.4% responded never. The frequency of responses is shown below in Table 169.

Table 13: Anonymously Post Feedback on the Course

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Frequently	84	21.0	21.3	21.3
	Often	98	24.5	24.8	46.1
	Sometimes	100	25.0	25.3	71.4
	Rarely	76	19.0	19.2	90.6
	Never	37	9.3	9.4	100.0
	Total	395	98.8	100.0	
Missing	No response	5	1.3		
Total		400	100.0		

Summary and Conclusions

A wide variety of other questions were posed to study participants. These are not reported here due to space constraints. The following strategies for managing social media are proposed based on the analysis of the results of the complete study.

Responses to various questions indicated that students found it much easier to relate to department-based online activities, rather than those conducted by colleges or a university. It would be wise for a university to focus more on department-level social media usage. There should still be a main university/college presence, but emphasizing department-level involvement will increase student interaction and participation with university-sponsored social media.

Within an overall university presence there should be information on clubs, social activities, and university-sponsored events. If colleges and departments of a university create a social media presence, then links to those presences should be listed on the main university site. Extracurricular club information (e.g. Student Government Association, Greek Life, or Christian groups) pertaining to the university as a whole should also be linked to in the overall university-maintained social medium.

Students will use a higher education oriented social media forum more frequently if it provides a way to communicate with classmates and instructors. Students are using technology and social media tools to communicate with friends on the Internet. If a new social media tool included features such as Facebook's internal chat or Google's Talk chat system, then more students will use a university-administered social media tool. Students desire interaction and two-way communication, not just the presence of announcements.

Instructors, faculty, and staff need to become more involved with social media in order to interact successfully with students. Students will use a social media tool to ask instructors questions about course work, future courses being taught, and general department questions. Instructors can be more involved with student group work by providing feedback through a social media

tool that all members can view. Students would be more willing to submit questions to an instructor, faculty, or staff member though social media.

To advertise a university-approved social media tool, use e-mail or word-of-mouth from department advisors, professors, and staff to invite students to a social media tool. Once these invites get started and spread throughout the students, other students will join that site from invites from fellow students. Invites from department advisors, professors, staff, and fellow students had the biggest influence for a participant to join a social media site. Having links posted on the school homepage came in a distant third, and was followed by posters, signs, and orientation booklets.

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Choosing a New Learning Management System (LMS)

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Abstract

In December of 2010, Salve Regina University formed a Subcommittee to review and recommend a new Learning Management System (LMS) solution for its faculty and students. This effort was necessitated by Blackboard's decision to suspend support for its WebCT offering by January, 2013. Although a similar LMS decision process is being experienced by several colleges and universities at this time, the situation at Salve Regina may be slightly different from others. The approach taken by the LMS subcommittee was to base the recommendation on an evaluation framework consisting of five components; these components included pedagogy, technology fit, financial cost, LMS migration effort and ongoing support. Four of the leading LMS solution providers demonstrated their system in front of an assembly consisting of faculty, staff and students. As a result of the vendor system reviews, two LMS solutions were designated as finalists (Blackboard Learn and Instructure's Canvas) in May, 2011. Because of the strong feelings toward each of the finalists' products, it was decided to conduct parallel pilots with volunteer faculty during the Fall 2011 semester. The paper will describe the activities, perspectives and challenges that were part of the overall experience. In many respects, given the constitution of the LMS subcommittee and the particular opportunities and constraints that exist at all schools, each school's experience could be considered similar to others and yet unique at the same time. This paper will describe the Salve Regina University experience in arriving at its recommendation and ultimate decision.

Introduction

The practice for using a Learning Management System (LMS) in higher education is well established. When used effectively, an LMS can augment the learning experience in terms of communication, productivity and student involvement. In his 2008 The Campus Computing Project report, Kenneth Green stated, " the percentage of college courses that use a CMS/LMS tool has risen from a seventh (14.7%) in 2000 to more than half (53.3%) in 2008." The offering of online education, interactive or self-paced as well as classroom-extended, has risen in importance. According to the 'Going the Distance' report of the Babson College Research Group (2011), "The percentage of institutions that agree with the statement 'Online Education is critical to the long-term strategy of my institution' reached its highest level in 2011 (65.5%)." The choice of an LMS, however, presents various options. Although Blackboard maintains the highest percentage of product use in higher education, Green's report states that "the survey data reveal that Blackboard's share of the campuses reporting a 'single product LMS standard' has fell in each sector (of the higher education field) since 2006." Thus, with so many choices, the decision to change a Learning Management System should not be taken lightly. The purpose of this paper is to de-

scribe the process to review and recommend a new Learning Management System at Salve Regina University and to share a set of lessons learned from this experience.

Formation of the LMS Subcommittee

In December, 2010, Salve Regina University, like several other institutions of higher education, embarked on a project to review and recommend a new Learning Management System (LMS) for its faculty and students. The main impetus for this project at Salve Regina University was the announcement by Blackboard, Inc., that the company would not be supporting its Blackboard *WebCT* product after 2012. A subcommittee of the Advisory Committee for Academic Technology, which serves as an advisory group for the Vice President of Academic Affairs (VPAA) on matters pertaining to academic technology, was charged with leading the project. The newly formed 'LMS Subcommittee' consisted of 10 members representing faculty, the Library, the Center for Teaching and Learning, Information Technology, and the Dean of Professional Studies.

The initial stage of the LMS Subcommittee project consisted of extensive reading and outreach. For example, the Educause web site included reports contributed by schools that had recently gone through an LMS selection process. These reports provided meaningful insights and perspectives. In addition, such schools as Georgia Tech University, Cornell University and SUNY Delhi had described their experiences with posted *Powerpoint* presentations. Further, colleagues at schools such as Roanoke College were personally contacted to discuss their school's recent pilot and selection process. Fortunately, pertinent references to assist us in our decision making process were readily available.

For Salve Regina, the duration of the project was the 2011 spring semester, only a four month period. Due to this tight timeframe, a number of activities had to be started as soon as the university returned from its Christmas intersession. These time constraints precluded pursuing a formal Request for Proposal process. The first project team session took place on January 31, 2011. At this session, the committee identified several project deliverables: selection of the LMS vendor products that would be reviewed, the dates and a format for the vendor presentations, and the process for evaluating the various LMS products that would result in making a final recommendation to the VPAA. With the end of the 2011 semester as the target date for securing approval by the VPAA of the Subcommittee's recommendation, it seemed feasible to then conduct the full LMS migration during the 2011-12 academic year, well within the timeframe of the Blackboard *WebCT* support suspension.

LMS Vendor Presentations

The LMS vendor candidates that were chosen by the LMS Subcommittee after its second project team meeting consisted of vendors both old and new in the LMS market. These candidates included Blackboard (Blackboard *Learn*), Datatel-MoodleRooms (particularly the Datatel-MoodleRooms *Intelligent Learning Platform* (ILP) collaboration), rSmart (*Sakai*) and Instructure (*Canvas*). Each candidate had a particular point of interest. The rationale for reviewing Blackboard *Learn* was an interest in the culmination of Blackboard's acquisition of WebCT in 2006 with the long-awaited merged product offering. Also, since Salve Regina uses the Datatel *Colleague* Administrative Information System, the option of the Datatel-MoodleRooms *Intelligent Learning Platform* (ILP) collaboration that was being showcased by Datatel at a number of its

client schools was appealing; this option included an integrated configuration of Datatel *Colleague*, the *Datatel Portal* and the *Moodle* LMS products. Further, a number of colleges and universities in the Rhode Island region were looking at the *Sakai* open source application, making it a noteworthy option. Finally, the Instructure *Canvas* application, although fairly new to the LMS market, had started to receive some attention from its early adopters and by the technical trade press.

A set of currently used essential LMS tools, based on the experiences of faculty at Salve Regina University, was collected by members of the Center for Teaching and Learning staff and used to develop a survey. A distinction was made between classes that were classroom based versus classes that were mainly online. For the classroom based courses, the set of essential LMS tools consisted of Syllabus, Course Materials, Roster, Web Links, Assignments and Gradebooks. For the online courses, the popular LMS tools included eMail, Syllabus, Course Materials, Assignments, Announcements, Discussions, Learning Modules and Gradebook. Since both types of class formats would be affected by an LMS application change, it was necessary to be sensitive of the needs for teachers and students involved in both delivery formats.

Several other LMS tools were included in the survey to help further identify faculty interests. These tools included the ability to connect to mobile devices, audio visual chat tools, group project team tools (discussion, journals, wikis, etc.), rubrics and learning outcomes, eBook compatibility, video capture capability, ePortfolio and single sign on, among other tools. The teachers were asked to indicate if these tools were "essential," "of interest," "nice to have," or "not needed."

The logistics of planning an on campus review of the four LMS vendor products was challenging. Those who work in higher education realize that proper planning and communication of important events have to occur weeks, if not months, ahead of time in order to get the appropriate attention. In the case of arranging and promoting presentations of alternative LMS vendors occurring within an already crowded spring semester, it was monumental. With the assistance of the VPAA office to encourage attendance at the LMS vendor presentations, communication was delivered to faculty and students in a timely manner. This action did not guarantee a large number of attendees, but at least the faculty and student constituencies were made aware of the presentation dates. LMS vendor presentations were arranged for the periods between late February and early April (working around a Spring Break week). Our first vendor session was on February 28, 2011 with Datatel and its *Intelligence Learning Platform* collaboration partner, MoodleRooms.

The method of conducting the LMS vendor presentations yielded inconsistent results. In this age of virtual connectivity, frequently an actual presentation is provided, in part or if not in full, by individuals who are not physically present at the demonstration location. In some cases the individuals who are virtually present at the demonstration, may themselves not be collocated at a remote site. The more dependent on virtual connectivity participation in a planned event, the more the risk that the presentation will not run as smoothly as one would like. The *Sakai* presentation, for example, did not fare as well as hoped, somewhat affected by the failure of the virtual connectivity. An example of this shortcoming was the necessity of communicating between the distant presenter and the local group of attendees by a combination of conference phone (which only worked in half-duplex mode) and a chat session. In the Datatel-MoodleRooms presentation, there was a person from Datatel who was physically at the event, but her remote partner present-

er, who was notified of her required presentation just earlier on the day of the event, experienced challenges in focusing on topics of interest for the event attendees. For the Blackboard *Learn* presentation, there were two representatives at different remote locations, neither of whom was physically present at the event; however, this presentation was conducted very smoothly combining a *WebEx* session augmented by a conference phone connection in the event auditorium location. The *Canvas* presentation included the physical participation by the Instructure sales representative who connected to a remotely hosted application to demonstrate the features of the application.

The location and time of the LMS vendor presentations contributed to low attendance. During the typical school week, because of the busy schedules of faculty and students as well as the unavailability of convenient locations for assemblies due to class meetings, the number of attendees at each of the sessions was modest at best. For example, the presentation time slot of Friday afternoon was not appealing to faculty or students even though this was the best time to use the school's large assembly room. On the other hand, the Friday morning time slot may be more convenient for the presentation, but since it was conducted at a distant (walking wise) location, attendance did not improve. The average attendance at the presentations was about 25 people.

Feedback from those who attended the LMS vendor presentations was obtained at each session. Members of the project team, particularly the Center for Teaching and Learning staff, developed survey forms (user and technical) that were distributed to each attendee who came to any of the presentations. The surveys were designed to capture attendees' interest in many of the LMS functional tools that were either available or not available in the presented LMS application. Because the LMS applications included most if not all of the desired functional tools, another perspective that the survey tried to capture was the ease of use of the desired functionality. Lastly, because the LMS applications hopefully represented the latest advances in LMS features, particularly related to pedagogy, attendees were asked to provide feedback on new functionality that they would like to incorporate in their own LMS courses.

Initial Evaluation and Recommendation

By April 8, 2011, all four LMS vendors had given presentations to representative Salve Regina faculty, staff and students in addition to the project team. Following these sessions, the project team embarked upon the review and recommendation process. The feedback from the surveys was analyzed and did not yield a unanimous choice of vendor; however, based on the feedback surveys, the *Sakai* alternative was eliminated due mainly to the poor product presentation session. The leading candidates were Instructure *Canvas* and Blackboard *Learn* with the Datatel – MoodleRooms alternative still in consideration. The project team members were asked to focus on key evaluation criteria including pedagogy, total cost, required technical support, LMS change management and the social and political climate among faculty. Other considerations included the ease of adaptability of the LMS by faculty, the existence of a procedure to create a course 'shell' for all courses offered for academic business continuity purposes, the provision of a facility to capture and report assessment information on our students and the inclusion of a plagiarism check component for submitted student work. References from other schools were also contacted for the remaining LMS vendor candidates.

With the end of the 2011 spring semester approaching, primary work responsibilities limited participation of project team members for subcommittee work. Thus, instead of reaching a culmina-

tion for the project team's review and recommendation of a new LMS application, only a portion of the necessary work was completed. For example, project team members felt it was important to have a side-by-side comparison of the remaining three LMS applications with regard to designated pedagogy elements, cost, technical requirements, change management considerations and ongoing Help Desk and System Admin support. Not all of this information, however, was objective and obtainable in a consistent manner. As the semester came to a close without a stated recommendation for a new LMS application, the LMS Subcommittee began to plan additional steps and activities to continue the review process.

At this time an attempt was made to recommend a new LMS system and thus suspend the overall decision-making process, hopefully saving a great deal of everyone's time. In early May, 2011, the CIO from the IT office recommended that we choose the Blackboard *Learn* alternative and immediately embark on a migration plan from the university's use of Blackboard *WebCT* to Blackboard *Learn*. This proposal was mainly due to the current business relationship between the university and Blackboard (the university was not only using Blackboard *WebCT*, but also Blackboard *ConnectED* and the Blackboard Xythos' *Digital Locker* product). Further, in the initial pilot use of Blackboard *Learn* in the CIO's 2011 spring semester undergraduate course, there was a favorable response from the survey completed by students in the class in their use of the Blackboard *Learn* application. The CIO's recommendation was not accepted, however, by the other members of the project team or by the VPAA. Because of the positive reaction of some faculty on the project team to the Instructure *Canvas* LMS application with respect to its pedagogical features, the project team decided that it would focus on two viable candidates and recommended that there be a pilot of each candidate conducted with volunteer faculty for the 2011 fall semester. The Datatel – MoodleRooms ILP configuration was eliminated mainly because Salve Regina did not have, at the time, one of the key components, the *Datatel Portal*, installed.

LMS Pilot Preparations

New challenges emerged in continuing the review and recommendation process for this phase of the extended project. In order to conduct a legitimate pilot on the two LMS application candidates in the 2011 fall semester, faculty had to be quickly solicited and encouraged to participate in training and learning a new LMS application to build their own LMS courses over the summer so that they would be ready for the 2011 fall semester. Through the strong encouragement of the VPAA office, however, over 20 faculty members came forward and volunteered to participate in the pilot training exercises over the summer. The volunteer faculty members were assigned to different pilot cohorts (Blackboard *Learn* and Instructure *Canvas*), participated in training exercises and developed their respective courses in time for the opening of the 2011 fall semester.

The methods of training for the pilot cohorts followed different formats. Arrangements were made with each vendor ensuring that training and the use of their LMS applications would be essentially the same. A chart comparing each vendor's handling of key pilot elements was prepared. Because the Blackboard *Learn* application was locally hosted on Salve Regina's network infrastructure and had already been in use during the 2011 spring semester, there was no additional cost in using this product; for Blackboard *Learn*, therefore, the university could direct its available funds for an on-site training workshop. Through the Blackboard *Learn* training workshop, the cohort participants could not only observe a sample course template being used, but were also able to build the initial content of their own courses. The Instructure *Canvas* application, on the other hand, is a remotely hosted system and part of this cohort's budget allotment

had to be expended for hosting services. Thus for the Instructure *Canvas*, the training consisted of a two hour remotely hosted synchronous workshop that essentially demonstrated the essential features and functionalities of the *Canvas* application. There was not a great deal of opportunity, therefore, to build one's own application during the workshop and thus the cohort participants had to rely on pertinent training notes, video clips, documentation and support from the Center of Teaching and Learning staff.

When the 2011 fall semester started, there were 15 faculty members using the pilot LMS applications in their courses. Most of the courses were classroom-extended in using the LMS applications but there were some courses that were also online interactive. A few of the pilot faculty had not used an LMS application before although most of the participants had been regular users of the Blackboard *WebCT* application which was still considered the official LMS application for the university during the 2011 fall semester. Of the 15 faculty members in the pilot exercises, eight faculty members were using Instructure *Canvas* and seven faculty members were using Blackboard *Learn*. In addition to the faculty who proceeded with the pilot exercises, there were other faculty members who had to excuse themselves over the summer due to unexpected time constraints or to experiencing unresolved difficulties in replicating existing functionality that they had utilized in Blackboard *WebCT* in the new LMS applications. For example, one faculty member had developed a series of *Camtasia* video clips for her Mathematics course, but could not get them to function in the new LMS application. Finally, one LMS Subcommittee member left the University, bringing the LMS Subcommittee total to nine project team members.

LMS Finalists' Evaluation Framework

After the 2011 fall semester pilots were underway, the project team then had to focus on developing a set of evaluation criteria to use in appraising the two finalist LMS candidates, Instructure *Canvas* and Blackboard *Learn*. The evaluation criteria chosen included pedagogy enhancements, the technology fit within the current Salve Regina application system and infrastructure configuration, the cost of each application (start up as well as ongoing maintenance), the extent of the effort to migrate from the existing Blackboard *WebCT* LMS application to the new LMS application (both in terms of file migrations and faculty training) and the planned operational support requirements once the new LMS application was in production use. For each criterion, a lead person from the project team was assigned to oversee the analysis and activities associated with the topic by working with appropriate peers.

For the pedagogy criterion, in addition to research and discussion conducted by this group on the merits of each LMS candidate, surveys were developed, distributed, collected and analyzed for both pilot cohorts for participating faculty and students. Project team members addressing this criterion emphasized the importance of a 'collaborative learning environment' that incorporated shared problem space, shared objects and shared or distributed cognition. Further, one Subcommittee member sought a system that "enables students to move from dependency to independency or self-directedness, from subject-centeredness to performance-centeredness, from knowledge development … to application problem-solving".

For another criterion, the technology fit to the Salve Regina administrative system and infrastructure configuration, more information was obtained from the respective vendor technical teams, the internal IT Administrative Information Systems and Network Services groups, and LMS application references. This included information on the merits of remote hosting versus local host-

ing particularly in relation to where the students accessing the application are located, our current dependency on a somewhat constrained Internet bandwidth configuration (100 Mbps), authentication procedures, data security procedures, backup and restore procedures, Microsoft versus Google products, the use of social media, the availability of mobile device solutions and ADA compliancy.

The change management criterion included several interesting elements: the preparation of the community, the promotion of the new system, developing the timeline of the migration, several training considerations (participants, content, materials, types of course delivery, duration and the inclusion of 'best practices' pedagogy as part the migration process). Finally, the extent of customization of the learning management environment in terms of the variety of course templates that could be offered was considered.

The administrator and IT support requirements criterion essentially addressed three key areas: migration, support and administration. For the migration component, items under consideration included the transfer of existing courses, the creation (batch or manual) of courses and the amount of vendor support available. The support component included the review, quantification and analysis of Help Desk logs and feedback from instructors on how much support they had to provide their students in resolving issues. Finally, the administration component addressed the procedures for uploading students, the number of steps involved, any issues that arose, the facility to manually add students or instructors, and the change in administrative controls compared with the existing Blackboard *WebCT* application.

The appropriate weighting of the evaluation criteria involved lengthy discussions for the LMS Subcommittee. Due to the composition of the project team, which included both faculty and business-technology representatives, there was a discussion on whether or not certain criteria should be weighted more heavily than others. For example, the academic division project team members advocated for a heavier weighting of the pedagogy criterion (to be 40-60% of the whole) while the business-technology division project team members advocated for an equal weighting (20%) of all five criteria. Further, the project team had to determine the basis for their particular evaluations of the LMS applications using the established criteria. For the pedagogy criterion, for example, the research conducted by the group members (mostly faculty members), as well as the feedback from the respective faculty and student members of the pilot courses would be a good basis for the project team members to evaluate the alternative products. For the technology fit criterion, the information gathered by the group members was the result of the aforementioned research and interviews with IT and vendor technical teams. Some of the elements described by the technology fit group, however, particularly relating to the cautions provided on operating a remotely hosted LMS application given the university's current Internet bandwidth constraints, the existence of a Datatel *Colleague* interface to ensure timeliness and accuracy of course enrollment information, and the present availability of developed mobile apps were not considered significant by other members on the project team. All of this information was shared with the project team in summary reports.

The comparison of the two LMS alternatives based on the cost criterion included special considerations. The cost of several functionalities in the LMS applications that were deemed important by the project team was requested from the LMS vendors. Since Blackboard *Learn* was a locally hosted application and Instructure *Canvas* was a remotely hosted application, there was an understandable significant price difference in the annual license fee. The annual Instructure cost

was much higher than the annual base Blackboard cost. One suggestion for making the two configurations more equivalent was to determine the cost of the purchase and use of the university's local network infrastructure elements needed for the locally hosted Blackboard *Learn* configuration; this suggestion was somewhat difficult because of the sunk cost already invested in the existing production Blackboard *WebCT* application which would be eventually freed to allocate to the new Blackboard *Learn* application and other areas. Another cost comparison that was problematic pertained to the cost of a desired functionality that was offered in one application vendor but not in the other. For example, Blackboard provided a cost estimate for its Datatel *Colleague* interface that was already being utilized by a number of schools whereas Instructure did not have a saleable interface to offer; in the latter case, when current Instructure *Canvas* schools who also used the Datatel *Colleague* system were contacted, they described a home-grown manual procedure that had been developed and was being utilized.

The existence of technology functionality for use by mobile devices was a challenging item to compare cost-wise between the two products. Because the Instructure *Canvas* application is relatively new to the LMS market, at the time of the evaluation, it was in the process of developing certain mobile device applications that could be used on Apple iPads. The Blackboard product, on the other hand, having been in the LMS market for several years, had an available set of mobile offerings; one offering was free when using the Sprint carrier or with Apple iOS products over a wireless network and another offering having an annual subscription that could be used on any and all mobile devices and carriers. The challenge in the cost analysis, therefore, was comparing the cost of a functionality that was already present in one vendor's offerings but was only the product roadmap of the other vendor.

The quantitative evaluation of the LMS applications proved too complicated for the intended purpose. The project team could not reach a consensus on the proposed weighting schemes for the evaluation component framework. As a result, the LMS Subcommittee chose to evaluate the LMS alternatives using a written recommendation by each project team member based on the elements of the evaluation framework.

Decision Making Process

At the end of the 2011 fall semester, each LMS Subcommittee member was granted a single vote for one LMS application or the other, Blackboard *Learn* or Instructure *Canvas*. The final tally, which was essentially a stalemate, was 5-4 in favor of Instructure *Canvas*. Since this vote was not unanimous or near-unanimous, the project team decided to request that senior administration make the final decision which would not be an easy task.

The conditions affecting the final decision of a new LMS application were significant. The strongest proponents of the Instructure *Canvas* were the academic division representatives on the project team while business technology representatives strongly advocated the Blackboard *Learn* application. Being an institution of higher education, the priority influence was rightly the academic perspective. On the other hand, there were some important factors from the business and technology side that had to be acknowledged and addressed. For example, network usage analysis had shown that the university's network infrastructure at this time did not have sufficient Internet bandwidth to accommodate the additional demands of a robust enterprise application such as an LMS at a remotely hosted site. It was felt that it would be important for the faculty and students to have a positive experience in developing and using the new LMS and if the system

performance in terms of response delays and network slowdowns were not acceptable, then it was thought wise to wait until a more robust Internet configuration could be provided. In this case, help was in the offing.

Salve Regina's membership in the Rhode Island OSHEAN consortium was fortuitous. OSHEAN is "a non-profit coalition of universities, hospitals, government agencies and other non-profit organizations dedicated to providing innovative, Internet-based technology solutions for its member institutions and the communities they serve." In the fall of 2010, the OSHEAN consortium was awarded a $21 million grant to extend the fiber optic infrastructure in the state of Rhode Island and bordering Massachusetts areas. With the grant funds in hand, complemented by monies committed by consortium members, a three year project timeline was established so that the fiber optic infrastructure project would be completed by summer 2013. The solution to the bandwidth constraint problem for the remotely hosted LMS application was near at hand, but not synchronous with the suspension of the Blackboard *WebCT* support maintenance.

The support termination timeline of the Blackboard *WebCT* application yielded a potential exposure in the LMS service level that the university had for its faculty and students. The Blackboard *WebCT* service support was targeted to end in December 2012 and the OSHEAN Beacon 2.0 Internet bandwidth upgrade was targeted for completion by the summer of 2013. The 2013 spring semester was, therefore, vulnerable to substandard system performance due to current Internet capacities or to the occurrence of service support lapses that could occur with the production LMS product configuration.

The final decision by senior administrators was a time-phased implementation in two stages. The first stage was to upgrade the Blackboard *WebCT* application to Blackboard *Learn* for the 2012-13 academic year and then to transition from Blackboard *Learn* to Instructure *Canvas* for the 2013-14 academic year and foreseeable future. Although the implementation stages are not going to be easy, the plan is to conduct the first stage in an understated manner, but to have a more visible, promotional campaign with faculty and students with the goal of greater adaptation by faculty for the targeted LMS application, Instructure *Canvas*, as part of the second stage of implementation.

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Sopa, Pipa, the OPEN Act: Where is This Going

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Abstract

When Wikipedia, Reddit and others engaged in a 24-hour Internet blackout on January 18, 2012, the public definitely took notice. What is the problem that SOPA and PIPA are attempting to address? Why do media companies feel that current legislation (notably the Digital Millennium Copyright Act) is inadequate to address copyright infringement and online piracy? Why does the tech sector feel that these acts threaten the heart of the Internet? This paper will review the issues and the current status of the legislation, both in the United States and in the European Union.

The Protest

The Stop Online Piracy Act (SOPA) was introduced in the House of Representatives in October, 2011. A similar bill, The Preventing Real Online Threats to Economic Creativity and Theft of Intellectual Property Act of 2011 (PIPA) was introduced in the Senate in the same session of Congress. Although many in both the media industry and the technology sectors paid lots of attention to these bills, the general populous became very aware of the provisions of the bills on January 18, 2012 when Wikipedia, Reddit and others engaged in a 24-hour Internet blackout to protest the provisions of the bills. Tens of millions of dollars were spent lobbying for and against these bills. Support of the bills was led by Comcast, News Corp., Viacom, Time Warner, the motion picture industry, the recording industry, and cable and broadcaster associations. Lobbying against the bills was led by Google, Yahoo. eBay, Amazon and Microsoft. However, it was a free action on the Internet which forced both the average citizen and the congressmen involved to step back and take a closer look at the provisions of both of these bills. [1] Many of the Senate bill's co-sponsors have since come out against PIPA in its current form, and the Republican chairman of the House Judiciary Committee has said that his committee will not take up the SOPA bill as planned in February.

What Do the Bills Address?

What do the bills actually say? Both are an attempt to address online copyright and trademark infringement. SOPA is a bill "to promote prosperity, creativity, entrepreneurship, and innovation by combating the theft of U.S. property, and for other purposes."[2] The bill targets foreign sites which engage in copyright infringement and/or intellectual property theft. Foreign Internet sites would be flagged by this bill if the owner or operator is committing or facilitating the commission of criminal violations that would be subject to seizure in the United States if they were domestic sites.

It is the Attorney General who is to take action if violations are found. Note that the government probably does not have the jurisdiction to take down an offending site directly since it is a foreign site. If the Attorney General chooses to pursue action against a site (either the operator, if the operator falls under U.S. jurisdiction, or the site itself if no U.S. jurisdiction can be found) court orders would require Internet service providers, search engines, ad providers and payment providers to take action. Service providers would be required to block access to the site, and search engines would be forced to remove all reference to the sites from their indices. Ad providers could no longer supply ad service to the site, and payment providers would have to terminate service to the site. There is a 5 day limit, that is, these actions must be taken no longer than 5 days after the orders have been served. Motions to modify, suspend, or vacate the orders may be filed through the courts.

Section 103 of the act is entitled "Market-Based System to Protect U.S. Customers and Prevent U.S. Funding of Sites Dedicated to Theft of U.S. Property." This section applies to Internet sites (or portions of Internet sites) that are U.S. directed and used by users within the United States. Such sites are in violation of the law (i.e. dedicated to theft of U.S. property) if they are primarily designed or operated for the purpose of offering services in a manner that enables or facilitates copyright violations. Payment providers and ad networks must cut off services to an accused site within five days after receiving a claim against the site by a copyright holder unless the operator of the site issues a counter-notification. However, at this stage there is no requirement that the copyright holder notify the accused site (making it difficult to issue a counter-notification!).

A couple of observations about the language of the bill need to be made. In the first part of the bill, note that the Attorney General can take action if a site is facilitating (not necessarily committing) copyright violations. A site with a comment box could conceivably be considered as facilitating since unintentional copyright violations occur frequently. This problem is even worse in the context of section 103. If a site has a feature which makes it possible for someone to commit copyright infringement (read YouTube, Facebook, Wikipedia, etc.) they can be considered as sites dedicated to the theft of U.S. property.

PIPA is a bill "to prevent online threats to economic creativity and theft of intellectual property, and for other purposes."[3] Section 3, "Enhancing Enforcement Against Rogue Websites Operated and Registered Overseas,' is very similar to section 102 of the SOPA bill. The Attorney General is charged with taking action, as in the SOPA bill. However, PIPA does not include the provision that search engines must remove infringing sites from their results.

Section 4, "Eliminating the Financial Incentive to Steal Intellectual Property Online," is similar to section 103 of the SOPA bill. SOPA has a provision to protect sites against false claims of illegal activity; the bill penalizes copyright holders who knowingly misrepresent a site's activity. There is no such protection in PIPA. One other significant difference in the two bills concerns the targeted sites. SOPA targets any foreign site that is committing or facilitating copyright infringement, whereas PIPA only targets those sites with no significant use other than copyright infringement.[4]

The Issues

Copyright infringement is certainly a problem worthy of attention. Although the battle over these bills is often phrased as "Hollywood versus Silicon Valley," the issues involved are serious. The media industry claims that innovation and jobs in content-creating industries are threatened by Internet piracy. The Global Intellectual Property Center, an affiliate of the U.S. Chamber of Commerce, claims that the intellectual property-intensive sectors employ large numbers of people and create trillions of dollars in gross output. The claim made is that hundreds of thousands of jobs will be lost without Internet piracy protection. Rupert Murdock, chairman of News Corporation at the time the bills were written, suggested on twitter that Google was a piracy leader. [5]

While one often does associate the media industry with Hollywood, it really includes any business that thrives on publishing content in some form, including the multitude of electronic forms available today. Consider the Ultimate Fighting Championship (UFC). UFC's business model depends on corporate sponsorships, event ticket sales, and pay-per-view buys. Over the last 4 years UFC started to notice a significant problem with taped events and archived material showing up on sites like YouTube. Three years ago live streams of its pay-per-view events started showing up. Pay-per-view buys are where UFC makes most of its money. UFC estimates that revenue losses in 2011 were up to $30 million. President Dana White openly supports SOPA and was recently hacked by the group Anonymous. [6]

The tech sector has many concerns about both of these bills. In their original form, the bills demanded that Internet service providers block users from being able to access offending sites by using Domain Name System blocking. This essentially makes the sites disappear from the Internet (much as some sites disappear in China and Iran). This could disrupt the Internet's underlying architecture. Lemley, Levine, and Post put this more strongly in their paper "Don't Break the Internet." They wrote that these bills represent a "legally sanctioned assault on the Internet's critical technical infrastructure."[7] The chief sponsor of each bill agreed to remove this requirement from each bill.

However, the tech sector still has serious concerns. First, the language is written so broadly that almost any site which allows user postings could be accused of facilitating copyright infringement.[8] While sites such as Wikipedia do indeed carefully monitor postings for copyright infringements, it is virtually impossible to check absolutely everything. Startup sites with fewer resources would be hard pressed to do the necessary checking. Also, court orders could theoretically force an entire website to be shut down because it has a link to a suspect site. Again, the job of checking every link on search engines to be sure there were no problems seems impractical, to say the least.

USACM (Association for Computing Machinery US Public Policy Council) analyzed both bills and concluded that the approach to disrupting rogue sites by removing them from indexing and search sites would be ineffective and problematic. The portions of the bills dealing with the Domain Name System would undermine years of technical work by the international community.[9] Both bills seem to violate basic principles of due process. The government can require that a website be removed without a reasonable opportunity for the owner or operator to present evidence that the request is not valid.[7] Both bills have immunity provisions if an ISP blocks access to a website if it has credible evidence that the pages involve copyright infringement. This

would seem to make it too easy to block access to a competitor's site. Overall the bills seem to be written without a clear understanding of the basic architecture of the Internet.

On February 6, 2012, a group of about 70 companies, nonprofit concerns, venture capitalists, grass-root organizations and others sent a letter to Congress urging Congress to step back and reconsider the issues rather than just make changes to SOPA and PIPA. The signers felt that the bills as proposed would be "harmful to free speech, innovation, cyber security, and job creation." The letter was coordinated by Public Knowledge and signed by the American Library Association, Consumer Union, Electronic Frontier Foundation, O'Reilly Media, and the Association of College and Research Libraries, among many others. The letter urged Congress to determine the economic effects of online infringement from unbiased sources, rather than just accept industry estimates. The letter also pointed out that future debates must avoid taking a single-industry perspective and must take into account "ways in which existing policies have undermined free speech and innovation."[10]

Another real problem with both of these bills is the changing nature of both the content-driven media industry and the tech sector. It is almost an attempt to write a bill which will be completely out of date before it emerges from Congress. This has happened before. When Robert Bork's video rental records became public during his Supreme Court nomination hearings in 1987, Congress was so outraged that it passed a strong bill protecting such records. However, that industry has now changed completely. The newspaper and magazine industry is certainly undergoing major changes. Hollywood is facing challenges also, as more and more consumers look for alternate ways to receive film content. In the tech sector, the shear plethora of devices on which content can be delivered is enormous and not likely to decrease. A persistent criticism of the music recording industry is that it is slow to respond to the need to build new business models that meet the demand for their product in a form that consumers want and can afford. However, Ike Epstein, General Counsel to UFC, claims that UFC has indeed responded and makes its content available on any platform consumers desire.

Why Should Colleges and Universities Worry?

While it seems that the stakeholders in all of this debate are powerful players (Time Warner, Google, Congress, etc.) the legislation in some form, if passed, will affect everyone. Colleges and universities today already face challenges to copyright infringement in ways that twenty years ago would have seemed unthinkable. Students do download media content illegally, and in most colleges and universities this violates the acceptable use policies of the institution.

Often an IT department is contacted by the copyright holder. These requests can not be ignored, and they are on the increase. The Office of Information Technologies at the University of Notre Dame reports that it received close to 3800 complaints in 2011, up from 850 in 2010. [11] Arizona State University had to respond to approximately 9,000 cases last year. Students often feel that they can "get away with it" until they are contacted by the IT department and realize that they are not invincible. Sometimes students feel that because there is no physical theft, nothing is wrong.

Obviously dealing with a large number of complaints stretches the resources of any IT department. Education of the academic community should help. Technology can also help. Arizona State, using a vendor to block all P2P file transfer on the campus wireless network and in the

dorms, significantly reduced the number of violations.[12] However, that is not the only problem for colleges and universities. Faculty used to have a good sense of what the term "fair use" meant, back when it involved just reproduction of parts of a text on paper to use in a physical classroom. The classroom now extends into the virtual world, with resources both gathered and distributed electronically from many different places.

Questions arise on what can be posted on a course management system or put into an online course. If the institution hosts the course management system, how does it comply with the provisions of SOPA and PIPA? Under PIPA, a large category of providers, registries and operators are required, when authorized by the courts, to take steps to prevent offending sites domain names from translating to the correct Internet protocol address. This category includes colleges and universities.[7]

The Anti-Counterfeiting Trade Agreement (ACTA)

ACTA is a multi-national agreement designed to deal with counterfeit physical goods as well as copyright infringement on the Internet. Negotiations began in 2006 with Japan and the United States. Canada, The European Union and Switzerland joined the preliminary talks, with official negotiations beginning in 2008. Negotiations were kept secret although documents occasionally leaked. The final text was released in November, 2010 and published in April, 2011. Eight countries, including the United States, signed the agreement on October 1, 2011. The European Union signed it in January, 2012, but it still must go through a ratification procedure in the European Union.

There is a great deal of controversy surrounding ACTA. Proponents claim it really is more like a statement of mutual support among countries, countries which agree to work to enforce intellectual property rights.[13] They claim that it is aimed at commercial scale activities on the Internet that involve counterfeiting and piracy, not at the general user of the Internet. Opponents have many concerns. The first is the secrecy with which the agreement was developed, with almost no input from the general public. Many feel it is worse than SOPA because it encourages service providers to police the Internet. They feel that the balance between copyright protection and the individual rights of Internet users is not adequately addressed. Some opponents wonder if laptops will be checked at border crossing for illegal downloads. The Economist, hardly a radical magazine, labeled the act as "potentially draconian."[14] The agreement leaves to individual countries the definition of what constitutes a commercial level of piracy.[15] Some members of Congress claim that this can not be termed a sole executive agreement and that it should be brought to the Senate for ratification.

On October 28, 2010 roughly 75 law professors signed an open letter to President Obama urging him to call on the Office of the U.S. Trade Representative (USTR) to halt its public endorsement of ACTA and indicate to other negotiators that the U. S. will not sign before public participation in the process and another round of negotiations. Note that this letter was sent almost one year before the U.S. signed the agreement.

The laws professors had three major concerns. The first was the secrecy with which ACTA was negotiated. The second was ACTA's designation as a sole executive agreement (as indicated above, this avoids Senate ratification). The third was concern that the purpose of ACTA is being misrepresented to the general populous. An act whose title includes "counterfeiting trade" does

not really explain the emphasis nor the heart of the agreement. Many of the lawyers signing the open letter are well known and come from prestigious law schools and/or occupy important positions in government. Signers include the chairmen of the both the House and Senate Committees on the Judiciary as well as other member of these committees. Other signers include the current Secretary of State, the current Secretary of Commerce, the General Counsel of the Department of Commerce, and the Deputy U.S. Trade Representative.[16]

Extensive protests in Europe have taken place, particularly over the weekend of February 11, 2012. Even prior to that, some signers became disenchanted. No sooner was the act signed than the European Union's chief negotiator resigned. Slovenia's envoy classified her signing of the act as an instance of "civic carelessness." Lawmakers in Poland protested by wearing Guy Fawkes masks. [14] Significant marches and protests were held in Germany, Poland, the UK, and the Netherlands over the February 11 weekend. The European Parliament must give its approval before the treaty is official. The International Trade committee, responsible for drafting the report for the parliament, met on March 1, 2012 and recommended that the treaty be first referred to the European Court of Justice for clarification. Six of the EU countries which have signed ACTA have halted ratification. It is assumed that they will wait for the opinion of the court.[17]

Alternatives?

The Digital Millennium Copyright Act (DMCA) of 1998 dealt with copyright infringement activities. The legislation implemented two 1996 World Intellectual Property Organization's treaties and also addressed a number of other copyright issues. The act gives Web hosts protection from liability when users engaged in copyright infringement, provided the hosts meet certain conditions and follow the stated rules. A copyright holder issuing a takedown request must submit a notification under penalty of perjury. DMCA focuses on removing unauthorized content from the Internet, but SOPA and PIPA, in the original form, target the sites hosting the content. As noted above, DMCA is used by copyright holders to issue takedown requests to colleges and universities, and it has worked relatively well. However, copyright and trademark infringement on the Internet is still a real problem, and the tools provided by DMCA may need to be augmented.

Representative Darrell Issa introduced the Online Protection and Enforcement of Digital Trade Act (the OPEN Act) in the House of Representatives on January 18, 2012. Senator Ron Wyden introduced it in the Senate. The act would give oversight to the International Trade Commission instead of the Justice Department and would apply only to websites that willfully promote copyright violations. Holders of intellectual property would petition the ITC to investigate whether a foreign website's real purpose was to engage in U.S. copyright and trademark infringement. The process established would guarantee that all parties involved be heard. If the ITC determined that indeed the foreign website was primarily engaged in fostering U.S. copyright and trademark infringement, a cease and desist order would be issued to payment processors and advertisers, not to Internet service providers. The OPEN Act does not interfere with the Domain Name System. [18] Google, Facebook, Twitter and others have supported this act, but the Motion Picture Association of America claims that it goes easy on Internet piracy. [19] Whether the OPEN Act is accepted as a compromise or SOPA and PIPA are revised and reconsidered remains to be seen.

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Virtual Technologies in the Classroom

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Abstract

Platform virtual machine technologies are playing a vital role in reducing IT budgets, energy, and space in networking classrooms. There is a myriad of feature rich platform virtual machine technologies, such as VMware vSphere, Microsoft Virtual PC, and Oracle VirtualBox, to name a few. Most of these products can be used free of cost in educational environments. Incorporating these technologies would save a significant amount of resources by providing numerous servers/workstations to run a variety of operating systems and services. The author was able to provide each student in a lab with 12 student workstations and a blade server system with three virtual machines, to run three different types of operating systems: Windows Server R2 HPC edition, Windows 7 Professional N edition, and Linux Fedora Core 15. These virtual machines provided students the freedom to install, configure, update, and remove software components; to administer their servers and workstations; to learn, and to simulate the Internet in the classroom. The class was divided into five networking regions representing the USA, Australia, Brazil, China, and Denmark. The computers had access to the Internet, so quasi top level domains: ".usa", ".aus", ".bra", ".chn", and ".den", were created to avoid conflicts with real domain names. A Linux server was used to isolate the regional networks. Students simulated the Internet by sending and receiving email messages from one network to another (e.g. from usera@cnit.usa to userb@cnita.aus) and accessing each other's web sites (e.g. www.cnit.usa, www.cnita.usa, etc.)

Introduction

Before the dawn of virtual machine (VM) software, in order to run multiple operating systems on a computer, one created multiple partitions on a computer and installed necessary operating systems. As a result, users were able to run multiple operating systems on one computer. The main problem with this approach is only one operating system could be booted at any one time. It was very time consuming and troublesome to install operating systems. In addition, it was impossible to switch operating systems back-and-forth without turning the computer off. So, what is a virtual machine?

> "A virtual machine (VM) is a software implementation of a machine (i.e. a computer) that executes programs like a physical machine. Virtual machines are separated into two major categories, based on their use and degree of correspondence to any real machine. A system virtual machine provides a complete system platform which supports the execution of a complete operating system (OS). In contrast, a process virtual machine is designed to run a single program, which means that it supports a single process. An essential characteristic of a virtual

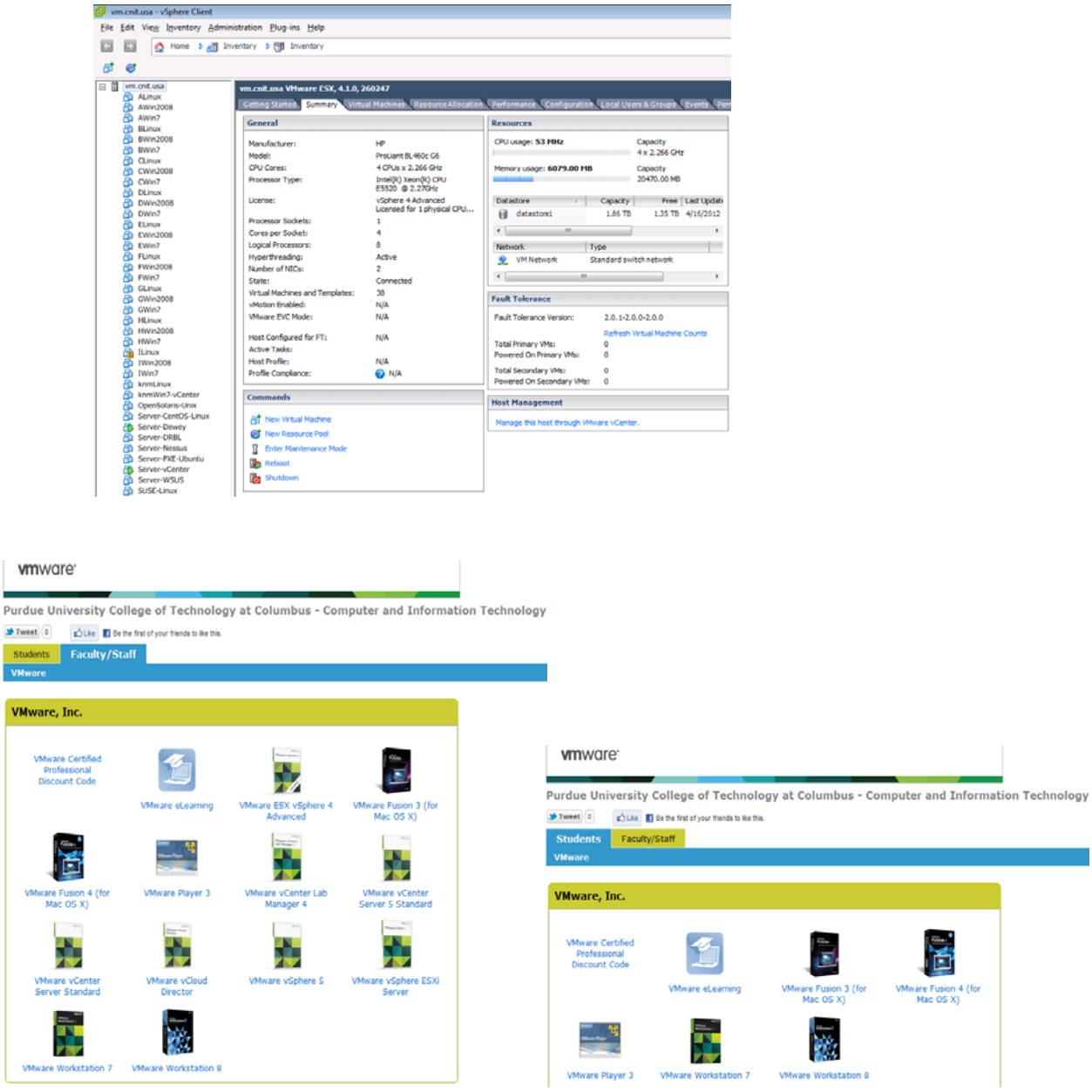
> machine is that the software running inside is limited to the resources and abstractions provided by the virtual machine—it cannot break out of its virtual world."

Virtual machines can save thousands of dollars. VM software allows users to install a number of operating systems on a single physical computer. The machine, where users install the virtual machine software, such as Microsoft's Virtual PC 2007, is called the "host." The operating systems that are installed in these virtual machines ("host") are known as "guest operating systems." This software also allows users to run all the virtual computers simultaneously. Fortunately, these days there is a myriad of virtual machine software packages such as, VMware's vSphere, Oracle's VirtualBox, and Microsoft's Virtual PC, to name a few. These technologies not only can be implemented in networking classrooms, but also in homes, businesses, and industries.

The URL http://en.wikipedia.org/wiki/Comparison_of_platform_virtual_machines contains a detailed comparison of several virtual machine software packages. As there are virtually hundreds of different software packages ranging from public domain to proprietary, it may be challenging to select perfect virtual machine software for one's environment. The author selected the VMware's vSphere ESXi Server due to several factors, such as cost (free), industry standard software (runs on a dedicated server), powerful enough to handle hundreds of virtual machines, and easy to install and manage.

The networking class with 12 workstations was converted to a dual purpose computer lab and a classroom. All the computers were upgraded with diskless trays for easy hard drive swaps, which allowed the classroom to be converted from a regular classroom to a network lab.

In the fall of 2011, the author taught a networking course with eight students. It was a perfect class to experiment with virtual machines, because this allowed the author to provide the required virtual machines without sacrificing performance with limited physical computing resources. The author became a VMware Academic Partner (VMAP), which allowed the author to use vSphere ESXi and vCenter software for free. vSphere allowed the author to create over 24 virtual machines. Each student was given three virtual machines. The students installed, configured, updated, and maintained three different Windows 2008 Server R2 HPC, Windows 7 Professional N, and Linux Fedora Core 15 operating systems on their three virtual machines. The virtual machines allowed the students to experiment and run multiple tutorials at their convenience. Students were able to access their virtual machines from outside the classroom. As a result, if the classroom is being conducted in a networking lab, students are able to work on their projects from any campus networked computer. For future courses, all VMs will be made available securely from any Internet connected computer. Therefore, students will be able to work on their VMs anytime from anywhere. Figure 1 depicts several virtual machines running different operating systems. Students are able to control their virtual machines, i.e. they are able to install, configure, and upgrade operating systems of their choice. They are able to turn the virtual machines on, off, pause, and run, as well. In order to save resources, the students were instructed to turn their virtual machines off when they were done working with their VMs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General
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Faculty/Staff
VMware
VMware, Inc.
VMware Certified Professional Discount Code
VMware eLearning
VMware ESX vSphere 4 Advanced
VMware Fusion 3 (for Mac OS X)
VMware Fusion 4 (for Mac OS X)
VMware Player 3
VMware vCenter Lab Manager 4
VMware vCenter Server 5 Standard
VMware vCenter Server Standard
VMware vCloud Director
VMware vSphere 5
VMware vSphere ESXi Server
VMware Workstation 7
VMware Workstation 8

Figure 1

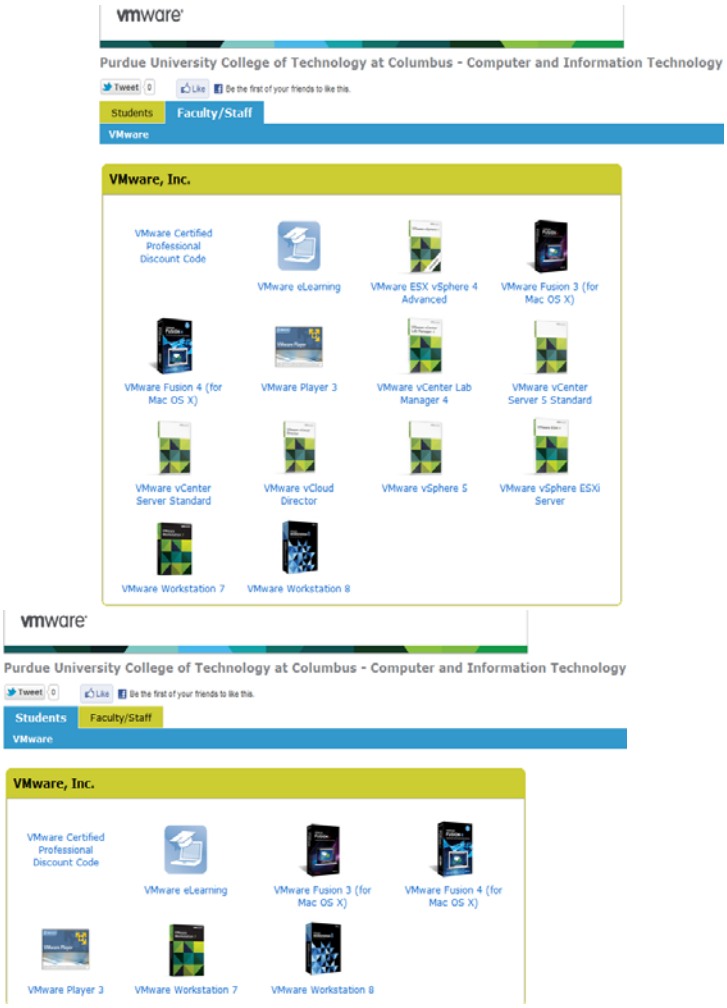


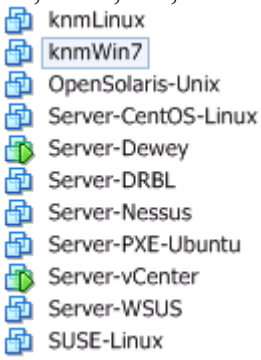
Figure 1 continued

Virtual machines allow users to experiment with new operating systems on a single machine. Some VM software can be installed on top of existing operating systems. For example, Microsoft's Windows XP Mode with Virtual PC can be installed on a computer running Windows 7 operating system, while other VM software requires dedicated computers, such as VMware's vSphere ESXi 4.1 Server. One of the advantages of using virtual machines, instead of swapping physical hard drives, is the ability to run multiple virtual machines simultaneously. Before users install virtual machine software, they need to make sure that the computer where the virtual machines are to be created has enough processing power, enough physical memory, and storage space. Users can also experiment with a variety of software developed for a different platform. As an example, if users want to run programs written for Windows 7 operating system in a Linux machine, users could create a virtual machine in that Linux computer and install Windows operating system on it. After the successful creation of the VM and installation of the OS, users will be able to install any Windows 7 specific applications on that guest operating system.

In the past, VMAP academic institutions could use VMware's software, including vSphere and vCenter for free. Last year VMware changed the licensing structure for VMAP. In order to use VMware software in an academic environment, educational institutions have to subscribe to VMAP. Current departmental subscription rate is $250 per year. Once an educational institution

subscribes to a departmental or institutional subscription, even the students of that department/institution are entitled to use this technology freely. As can be seen from figures 2 and 3, the list of software that is available for students is different than that for faculty/staff. Faculty and staff have access to server components as well.

Oracle's VirtualBox is available for download for free. It runs on Windows, Linux, Macintosh, and Solaris hosts. One can install a number of guest operating systems, including Windows (NT 4.0, 2000, XP, Server 2003, Vista, and Windows 7), DOS, Linux, and OpenSolaris.



Microsoft's Virtual PC can be downloaded for free. If users have a newer PC, but would like to use their older software which users no longer can install, e.g., Windows XP software on a Windows 7 machine, users can create a virtual machine on their Windows 7 computer and install Windows XP operating system to be able to install any Windows XP related software. This way, users can enjoy both Windows 7 applications and Windows XP application on the same computer at the same time. Figure 4 depicts several different operating systems running on one host, including OpenSolaris, CentOS, Ubuntu, Windows Server 2008 R2, and Windows 7 Professional N operating systems. This gave the author the flexibility to test any software necessary without acquiring any new hardware. Once the initial installation and configuration of virtual machine software is complete, it is relatively simple and quick to create new virtual machines. Imagine running all of these operating systems on separate computers simultaneously. It would require many physical servers, considerable electricity and space. With the use of proper virtual machine software, it is easy and efficient to clone, backup, restore, and manage hosts.

In conclusion, by implementing proper virtual machine technologies, educational institutions, faculty, staff, and students can save a tremendous amount of money, resources, and time. The time it takes to learn about virtual machines far outweigh the benefits. The implementation of VM technologies is especially advantageous in the educational environment, because the budget is often limited in these institutions and the capacity to experiment with a variety of applications and operating systems (especially in networking classrooms) is usually great. As all the VMs are isolated and traffic is segregated to specific subnets, there is no impact on production network.

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Using Facebook Education Pages as a Medium for Student Communication and Collaboration

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Abstract

The initialization, development and deployment of a Facebook Education Page for a mathematically-based course has been created in attempt to alleviate the necessity for students to "friend" faculty on Facebook and to foster academic discussions outside of the classroom. The Facebook Education Page connects students and faculty in much the same way one might "like" a particular business or cause without sharing personal information. Facebook Education Pages are created and moderated in manner akin to familiar wikis and blogs within popular course management software packages. Students and faculty can interact via the Facebook Wall, Photo and Video Libraries and Internet Links. The distinct advantage that Facebook Education Pages hold over other course management software packages remains Facebook's popularity with students. Other advantages and disadvantages of the Facebook Education Page versus more tradition forms for electronic communication will be presented.

Introduction

As instructors, many ask the question, "How can I motivate my students to *want* to succeed in my course?" Many feel that motivation begins with communication. Some students can benefit greatly from material reinforcement outside of the classroom. Traditionally, outside of the classroom activities have been limited to visits from students to faculty during office hours. There are many distinct advantages to face-to-face contact during office hours outside of the classroom. For instance, students receive instant feedback on difficult tasks and instructors better understand how an individual student approaches a particular task. Contact during office hours also has several deficiencies as well. Time conflicts are perhaps the most common difficulty encountered. Frequently, both instructor's and student's hectic schedules do not overlap. Many times, instructor's listed office hours go underutilized and they begin to schedule other activities during those times.

Communication outside of the traditional nine-to-five workday is crucial to engage students in course materials. One of the most common communication techniques between both students and instructors continues to be email. Email is a fantastic forum for logistic questions, such as, "When is assignment 3 due?" or "Will the exam cover chapter 2?". Email is also a functional medium for students to ask for assistance, like, "Can I stop by your office hours?" or "Can you cover homework problem 56 in lecture tomorrow?". However, email communication fails when

a student asks the "hows?" and "whys?". Explanations of concepts can be quite difficult over email.

Many Course Management Systems supply conduits to enhance outside of the classroom interactions between instructors and students. Discussion boards, Wikis, Blogs and virtual "whiteboards" are offered by most CMS software manufacturers. While many of these features work every well, many students, especially those that would benefit the most, do not participate in scheduled events incorporating these features.

Since many students use their handheld mobile devices almost continually when outside of the classroom, it can be advantageous to implement activities centering around these. But what are they doing on those devices? When polled, most are not surfing the internet or checking email; most are texting, checking Twitter or updating Facebook. Texting and Twitter are fantastic possibilities to replace or supplement traditional email. However, this method of communication requires the student and instructor to exchange cell phone numbers and possibly disseminate those numbers to all members of the class. While it is very possible for an instructor to create a private texting account for a course, most students do not do so; and moreover, both instructors and students prefer to keep their cell phone numbers private. Twitter has been somewhat successful in reaching students in a more timely fashion than email, and simply requires students to follow the course's Twitter account. The major limitation of Twitter engaging students outside the classroom is very nature of a tweet. Typically, a tweet is a small, one line statement or question designed to provoke small, one line statements or questions. This severely limits discussion possibilities.

Facebook appears to be a very suitable bridge between instructor and student outside the classroom communications. However, recently Facebook "friending" between instructors and students has been frowned upon. Instructors and students have been advised to create separate personal and professional Facebook pages. But, if students never check their professional Facebook page, this defeats the purpose of using Facebook as a communications tool outside of the classroom The Facebook Educational Page appears to alleviate some of the inherent problems that instructors wanting to use Facebook in their courses encounter.

Development

The Education Page within Facebook allows instructors to create a Facebook page for courses that is separate from their personal or other professional Facebook pages. Moreover, the Facebook Educational Page permits students to "like" the Education Page just as they would "like" a page from their favorite musical group or clothing retailer. This level of abstraction permits students and instructors to interact with the course Educational Page without the student and instructor being "friends"; so, no personal information is shared.

A template for a Facebook in Education page can be found at www.facebook.com/education. Then, simply click the link in the upper right-hand corner entitled, "Create a Page". From this page, select either "Local Business or Place" or "Company, Organization, or Institution". The "Local Business or Place" was chosen for this work, then "Education" was selected from the "Choose a category" drop down menu. Next, the administrator/owner will be asked to supply a Profile Photo, then provide information about the course, and provide a Facebook Web Address. Any or all of these steps can be skipped and returned to later. This creates a skeleton page, opens

the Admin Panel, and then Facebook automatically walks you through a standard tutorial development scenario. The owner/administrator may now add content as with any traditional Facebook page.

Deployment

As the Education Page administrator, the Admin Panel will always be available, unless manually hidden. The "Manage" button in the Admin Panel provides access to privileges, security and other management settings for the current Education Page. From the "Manage" button, selecting "Edit Page" allows the administrator/owner to set and modify most settings in the Education Page. The "Manage Permissions" tab opens first. It is highly recommended to set "Block Profanity" to "Strong". Other settings can be modified using the tabs on the left side of the page. In the "Manage Admins" tab, the owner/administrator can select other users to modify the layout of the page.

The "Build Audience" button in the Admin Panel permits the administrator/owner to invite people to "like" the page. The administrator(s) may share a link to this Educational Page via their personal or professional Facebook page with the "Share Page" link from the "Build Audience" tab. The administrator(s) may also invite people to "like" the page via email contacts or cell phone text message, if available. Perhaps the most successful way to advertise an Educational Page is to send a mass email to all members of a particular course or courses via some course-management software. Administrators of the Educational Page may also choose to create a Facebook "Ad". This permits the page to be seen as an ad on other's Facebook pages, similar to product placement, groups and organizations seen frequently. The administrator may select specific demographics to display the page and it may reach a much larger audience. However, this has two key hindrances. First, there is a cost associated with this feature, but moreover, a typical Educational Page is created for a specific course or a set of courses, with a specific audience in mind. So, while access from individuals outside the targeted course(s) may occur, it may not be the main purpose or desire of the page administrator.

Once created and the audience targeted, specific materials are created and deployed on the Facebook Educational Page. The primary goal of the Facebook Educational Page is communication outside of the classroom. So, a major function is as a bulletin board, similar, if not identical to the announcements section in most course management systems. Also, photos, pdf files and links to videos from sources like YouTube can be created just as with any Facebook page. Many times, student work-study workers enjoy developing the aesthetic portions of the page by adding photos and banners created during class activities.

Analysis

Once thirty or more individuals "like" the Facebook Educational Page, the "Insights" section will become active for the administrator. In the "Overview" section, the administrator will see statistics like Weekly Total Reach, Posts, and People Talking About This. The Weekly Total Reach is the number of unique people who have seen any content associated with the Facebook Educational Page in the past 7 days. The Posts is the total number of posts each day represented by a bubble that grows as the number of posts grow. And, the People Talking About This is the total number of unique people who have created content on the Facebook Educational Page in the last 7 days. A timeline graph over the past week is prominently displayed that can be

analyzed to investigate topics of interest or disinterest as well as difficult portions of the course as identified by individuals liking the page. A list of all posts made on the Educational Page is listed at the bottom of the screen. Posts can be queried by type in this section as well and the administrator also has the ability to Export Data for a specified date range in either Excel (.xls) or Comma-Separated Values (.csv) formats for page level and post level data. The Help screen in the overview section provides a tour of the features and a pdf guidebook to using these statistics.

The "Likes" section gives demographic information regarding those individuals that "like" your Educational Page. Gender percentages broken into age groups are prominently displayed via bar charts. Also, country, city and language information is provided. A line graph of new Likes versus new Unlikes is displayed at the bottom of this section for the past week of data. The administrator also has the ability to export this data similarly as the previous section.

The "Reach" section gives information on how many people saw any content about this page for the past month through three different channels: Organic, Paid, and Viral. Organic reach is the number of unique individuals that saw content in News Feeds, tickers or on the page in the past month; Paid reach is the number of unique individuals that saw an Ad or Sponsored story directed to this page in the past month; and Viral reach is the number of unique individuals that saw a story about this page published by a friend in the past month. A Viral story can include liking this page, posting on the page's wall or commenting or sharing a post from this page. A frequency of users over the past month graph that indicates the number of times an individual user returned to the page is also displayed. Finally, total page views and unique page views are indicated by a line-chart at the bottom of the page.

The "Talking About This" section mainly gives information on the number of unique individuals that created a story about the Education Page in the past month and its Viral reach. Much demographic data for the Reach and the Talking About This Page sections are only available when 30 or more individuals access the Educational Page in a given month.

Conclusions

The Facebook Education Page can be a power conduit for student communication that is readily accessible to both instructors and students from wifi enabled devices. From a student view, the Educational Page is similar to any other page that they might "like". Information from the liked-Educational Page appear on their page's news feed normally, so when students access Facebook they have the opportunity to view announcements on the Educational Page, post topics to the Educational Page's Wall, and interact with multimedia posted within the Educational Page.

From an instructors view, the Facebook Educational Page is very simple to design and create. Content can be created and displayed as with any Facebook page. However, students must no longer "friend" the instructor's personal or professional page; students simply like the Educational Page so no personal information or personal wall postings are viewable by either instructor or student. Also, instructors have the ability to analyze many statistics regarding the Educational Page that could be useful for annual preference review or assessment purposes

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Privacy and Security Considerations when using Facebook Applications

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Abstract

Social networks such as Facebook are becoming increasingly popular. One can connect with many networks of friends using the built-in capabilities and the large number of available applications. This paper/session will provide an overview of both creating and using Facebook applications and then cover some relevant privacy and security considerations. Operationalizing the ideas with a simple application created by the author makes the usability, privacy, and security considerations easier to understand.

Introduction

Social networks such as Facebook are becoming increasingly popular. This paper will look at various issues and considerations when creating and/or using Facebook applications.

As Scott McNealy, founder and CEO of Sun Microsystems, is famous for saying about privacy in the information age, "You have zero privacy anyway. Get over it.".

Facebook Graph

In mathematical terms, a graph is a set of nodes with edges (or arcs) between nodes. Graphs can have directed (uni-directional) edges or undirected (bi-directional) edges. The social graph has nodes that are people, places, organizations, etc. Each node has properties, some of which are easily available and some are not. The edges between the nodes are connections such as "likes", "friend-of", "married-to", etc. Some connections (are supposed to) go both ways, such as "friend-of", "married-to", "in-a-relationship-with", etc., while some connections are not necessarily both was, such as "likes". In the Facebook graph, users, companies, etc., are nodes in the graph while relationships such as "like" are directed edges and "friend" is an undirected edges.

The data structures and algorithms for a graph consisting of a collection of nodes and edges between nodes have been well-studied and have many interesting properties (not covered here). There are many interesting properties of graphs that are relevant to social networks. Details are omitted except where relevant.

A Facebook URL reference to a user can take one of the following forms:

```
http://www.facebook.com/profile.php?id=9999999999
```

where the user's id (i.e., a node in the graph) is **`9999999999`**, or

```
http://www.facebook.com/domain.name
```

where **`domain.name`** is the domain name selected by that user.

Some minimal information is publically available for each node to everyone on the Internet. One way to obtain this information is the following.

Assume that the domain name is BarackObama.

Enter the following URL in a browser.

```
https://graph.facebook.com/BarackObama
```

One need not be logged into Facebook, nor even have a Facebook account, to obtain the following (on 2012-05-05).


```
{
"id": "6815841748",
"name": "Barack Obama",
"picture": "http://profile.ak.fbcdn.net/hprofile-ak-ash2/373522_6815841748_1977252057_s.jpg",
"link": "http://www.facebook.com/barackobama",
"likes": 26390718,
"cover": {
"cover_id": "10150761119476749",
"source":                                                    "http://sphotos.xx.fbcdn.net/hphotos-
ash3/s720x720/531266_10150761119476749_6815841748_9521158_1314408072_n.jpg",
"offset_y": 0
},
"category": "Politician",
"is_published": true,
"website": "http://www.barackobama.com http://www.whitehouse.gov/",
"username": "barackobama",
"about": " This page is run by Obama for America, President Obama's 2012 campaign.
   To visit the White House Facebook page, go to facebook.com/WhiteHouse.",
"birthday": "08/04/1961",
"talking_about_count": 370572
}
```


Note that the following link would provide the same results.

```
https://graph.facebook.com/6815841748
```

However, if one wants to see the "likes" of this node, the following URL will not work.

```
https://graph.facebook.com/6815841748/likes
```

The result returned is the following.


```
{
   "error": {
      "message": "An access token is required to request this resource.",
      "type": "OAuthException",
      "code": 104
   }
}
```


In 2011, after some privacy/security revelations, Facebook introduced OAuth authentication.

After a Symantec report about Facebook lack of security/privacy broke in May 2011, Facebook worked with Symantec to close the flaw. From the Facebook site: "*In addition, we have been working with Symantec to identify issues in our authentication flow to ensure that they are more secure. This has led us to conclude that migrating to OAuth & HTTPs now is in the best interest of our users and developers.*". This and more is at http://developers.facebook.com/blog/post/497/.

Facebook's progressive deadlines for using the new API (to address fix the flaw) called OAuth 2.0 + HTTPS (for authentication during login) ended on October 1, 2011, which should have closed the vulnerability.

This oversight disclosure in May 2011, along with the release of the Firesheep add-in to see passwords and authentication details by anyone running the add-in on a public wireless network, led to the adaptation by Facebook (and other sites) of increased use of secure HTTPS during log-in and during the resulting sessions.

As noted above, one can see any user/node information to some degree. However, users can block other information. So for example, one cannot see a protected page if one is not logged in. The message is as follows.

> *This content is currently unavailable: The page you requested cannot be displayed right now. It may be temporarily unavailable, the link you clicked on may have expired, or you may not have permission to view this page.*

Permissions

It is eye-opening when a simple app, when given permission by a user, can access all sorts of information – friends' names, photos, etc. A weak link appears to be that a user can also give access to friends' information - except email address. So if a user has "100 friends", it only takes one friend to agree to provide access to much of the user's information. However, testing such rights requests, those rights do appear in the rights request list as a right to friends' information, I have not seen any app yet that does request those rights.

It is currently difficult for a user to block an application. Going to the application's page via the id number (as in most links) redirects to the permissions page. One must find the fan name for the id and use that to get to the page that allows the obscure dropdown that allows one to block the application. Unless there is an easier way, most applications are not blocked from appearing in a user's feed if a friend uses that application.

It is unclear what the catch-all right "any other information I've made public" means.

Privacy Settings

Here are some excerpts from the Facebook site regarding privacy settings in Spring 2012 - Facebook changes these from time to time. These include features enforced using the OAuth security standard.

- How You Connect. Control how you connect with people you know. Edit Settings.
- Profile and Tagging. Control what happens when friends tag you or your content, or post on your wall. Edit Settings.
- Apps and Websites. Control what gets shared with apps, games and websites. Edit Settings.

- Limit the Audience for Past Posts. Limit the audience for posts you shared with friends of friends or Public. Manage Past Post Visibility.
- Blocked People and Apps. Manage the people and apps you've blocked. Manage blocking.

Here are the choices: (not all available for all questions)

- Everyone
- Friends
- Friends of Friends

Here is how you connect:

- Who can look up your profile by name? Friends
- Who can look you up using the email address or phone number you provided? Friends
- Who can send you friend requests? Friends of Friends
- Who can send you Facebook messages? Friends

Profile and tagging

- Who can post on your Wall? Friends
- Who can see what others post on your profile? Friends
- Who can see posts that appear on your profile because you've been tagged? Friends
- Review posts friends tag you in before they appear on your profile. On
- Review tags friends add to your own posts on Facebook. On
- Who sees tag suggestions when photos that look like you are uploaded? Friends

Apps, Games and Websites

On Facebook, your name, profile picture, gender, networks, username and user id (account number) are always publicly available, including to apps (Learn Why). Also, by default, apps have access to your friends list and any information you choose to make public.

Edit your settings to control what's shared with apps, games, and websites by you and others you share with:

- Apps you use. You're using 1 app, game or website: HelloWorld. Edit Settings.
- How people bring your info to apps they use. People who can see your info can bring it with them when they use apps. Use this setting to control the categories of information people can bring with them. Edit Settings.
- Instant personalization. Lets you see relevant information about your friends the moment you arrive on select partner websites. Edit Settings.
- Public search. Show a preview of your Facebook profile when people look for you using a search engine. Edit Settings.

Instant Personalization

We've partnered with a few websites to provide you with great, personalized experiences the moment you arrive, such as immediately playing the music you like or displaying friends' reviews. To tailor your experience, these partners only access public information (like your name and profile picture) and other information you've made public. When you first arrive at the following sites, you'll see a notification message and an option to turn off the personalized experience:

- Bing - Social Search
- Pandora - Personalized Music
- TripAdvisor - Social Travel
- Yelp - Friends' Local Reviews
- Rotten Tomatoes - Friends' Movie Reviews
- Clicker - Personalized TV Recommendations
- Scribd - Social Reading
- Docs - Document Collaboration

To turn off instant personalization on all partner sites, uncheck the box below.

(checkbox): Enable instant personalization on partner websites.

If you uncheck the checkbox, the following message appears. "*Are you sure?*"

"*Recently people have been spreading false rumors about instant personalization. This program was introduced in April 2010, and if you choose to disable it, none of your information can be shared when you or your friends arrive on these websites.*"

By confirming, you will no longer immediately see customized content and friend activity on partner websites.

Public Search

Public search controls whether people who enter your name in a search engine will see a preview of your Facebook profile. Because some search engines cache information, some of your profile information may be available for a period of time after you turn public search off. See preview

To use this feature, first go to How You Connect and set "Who can look up your profile by name?" to "Everyone".

(checkbox) Enable public search

Manage Blocking

Blocked apps. Once you block an app, it can no longer contact you or get non-public information about you through Facebook.

Blocking apps

Facebook does not make blocking apps (and app invites)particularly easy nor obvious. And the way to do it appears to change from time to time - to make it harder to do. Here is one way to do it at the time the author investigated this capability.

1. In the search box, locate the app fan page. For example, "Hidden Chronicles". Here is how Facebook says to find an apps fan page. To find an app's fan page,

- Return to your home page by clicking Back to Facebook at the top right corner of the Help Center
- Enter the name of the app in search
- Select the result under the Pages heading
- This result is the app's fan page

2. Unfortunately, most apps appear to redirect to their permissions page rather than their fan page. One must find the app fan page itself. The URL has the following form.

```
https://www.facebook.com/dialog/oauth?client_id=100333333405439&redirect_uri=...
```

In this case, the client id is 100333333405439. So the app page is at

```
http://www.facebook.com/100333333405439
```

Unfortunately, this page also redirects to the request for permission page. But the URL is visible for a moment and what one needs is the app name for use in the URL rather than the app id.

This app has the name "HiddenChronicles" so go to the following url which Facebook calls a "fan page".

```
http://www.facebook.com/HiddenChronicles
```

3. To the right of "Go to App" is a dropdown. In the dropdown, there is an option to "Block App". Select this option. The displayed message is as follows.

> *Blocking Hidden Chronicles will prevent others from sending you invitations and requests for this app and will prevent this app from getting any info about you. This will also prevent you from seeing Hidden Chronicles if other people have it installed.*

Blocking this app results in the following message.

> Hidden Chronicles has been blocked. Close.

4. Go back to your "Home" screen. That app should have disappeared.

Facebook Applications

A Facebook application, initiated in Facebook from a user account, has a public id and a private id. The private id should be kept secret - known only at the server and passed encrypted (using SSL via HTTPS) when making requests to Facebook from a server (and not from a client).

Facebook supports a server-based PHP API and a client-based JavaScript API (using AJAX). Applications using .NET languages can be created and are often based on the JavaScript client API.

Like many web-based systems, Facebook often changes so it can be a challenge to keep code using the API working as changes are made that effect the application functionality. And there are many parts of the documentation that are not quite correct (as with most web-based documentation) so Internet searches can be used to find out what one is actually to do instead of what Facebook says should be done to make a given feature work.

Summary

This paper has looked at various issues and considerations when creating and/or using Facebook applications.

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Mobile Computing Robotic Devices

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Abstract

This paper/session will look at and present some interesting mobile special-purpose computing devices that involve robotics technologies with which the author has experience. The devices presented, with working examples developed by the author, include the Arduino, the NetDuino, the iRobot Create, and Lego Mindstorms. The Arduino is a open source hardware board which has many available sensors and actuators. The NetDuino adds the .NET Micro Framework. The iRobet Create is a non-vacuum cleaner version of the iRobot Roomba. Lego Mindstorms is a Lego-based robotics system. All have wireless capability available and can be used for customized and interesting applications.

Introduction

As Scott McNealy, founder and CEO of Sun Microsystems, is famous for saying about networks, "The network is the computer". Connected mobile devices are becoming more and more important in the information age. This paper will look at and present some interesting mobile special-purpose computing devices that involve robotics technologies with which the author has experience.

Zen X-Fi2

The Zen X-Fi2 is a small precursor to tablet technology today. It has an mp3 player with small screen and is fully programmable using the Lua programming language. It has wireless capability but has limited applications as the Lua port lacks some essential programming features and has a limited user and support base. It is however, an interesting piece of technology. It has a simulator system that makes it ideal as a mobile programming platform without off-the-shelf code widely available on the Internet (i.e., students would be hard-pressed to copy solutions to problems). The author used the API to create an application to browse and display parts of a large hierarchical textual database. Some issues involved reverse engineering the widths of each character in each font - necessary to wrap text on the screen, and creating a custom object system for widgets. Here is a small example Lua program that draws text at the position touched on the screen.

```
red = color.new(255,0,0)
yellow = color.new(255,255,0)

while true do
   if control.read()==1 then
      if control.isTouch()==1 then
         x1,y1 = touch.pos()
         text.size(30)
         text.color(red)
         screen.fillrect(0,0,
            screen.width(),
            screen.height(),
            yellow)
         text.draw(x1,y1,"Hello, World","left",screen.width())
         screen.update()
      elseif control.isButton()==1 then
         if button.click()==1 then
            break
            end
         end

   else
      os.sleep(10)
      end
   end
```

Android devices

Android devices such as tablets and phones run the Google Android mobile operating system. This system is Java-based with customizations to the API from Google. The system is extensive and examples are widely available. The author ported the same large hierarchical textual database to the Android platform. Some issues involved creating a custom layout manager, using absolute layout, determining when the layout was actually invoked, and reverse-language display issues for some right-to-left languages. This issue is present in Android 2.2 but appears to have been resolved in Android 3.0+. Other interesting mobile apps used by the author, both free and from Google, include Google Sky Maps and My Tracks. Google Sky Maps allows one, via a GPS and accelerometer in the phone to display the stars, planets, etc., where they would be seen - even if the sun is out and even through the earth. My Tracks makes the phone a GPS tracker with maps, etc. Each route can be uploaded to Google docs and maps and edited/published from there.

The rest of this paper will concentrate on less well-known mobile devices.

Communication and development

Any mobile device will almost certainly need a larger host system in which to develop the software used in the mobile device. Although simulators can be useful, it is not as motivating as having an actual device with which to get feedback on what is being developed.

The typical communications transfer between host and device uses serial communication. This can be via a traditional serial port or a more modern USB (Universal Serial Bus) serial transfer. There are many freely available programs to do serial communication. For DOS/Windows users, the serial ports are COM1, COM2, etc. With USB, these ports can have much bigger numbers than with the DOS. Be aware that serial communication often requires that the program run under administrator privileges (or use a device driver that has such privileges).

Remote transfers are usually done via wireless technologies like Bluetooth, Wi-Fi, or related wireless technology (e.g., ZeeBee). For robotics applications, having a robot connected via a serial line is very limiting. Therefore, one of the first objectives for robots that are not wireless is to add some form of wireless communication.

Most systems can be troublesome to set up and configure. Luckily, the web has made it easier to find someone else who has had the same issues and, hopefully, find resolutions to those issues.

Some examples.

- Bluetooth varies widely in how compatible it is with what is being used. If a Bluetooth connection does not work, try it with multiple computers/devices to see if it is the system being used.
- Some systems were developed with one operating system (e.g., Windows XP) and never updated to more recent operating systems (e.g., Windows 7). Various means can often be used to connect - but Internet searches can save time in this respect.
- Many devices have ways to update the firmware and/or development systems. It usually helps to have the most recent versions. However, occasionally it is useful to have an older version of the firmware, etc.

In general, the author has found that for many devices, when a Microsoft software alternative is available (i.e., variants of the .NET architecture), it is easier to develop using the Microsoft development systems than with other systems. For some systems, such as Android phones, one has few choices - the Google Android development system.

However, Microsoft has the Microsoft Robotics Development system using the Visual Programming Language that supports a large number of robot technologies. The Microsoft .NET Micro Architecture supports small mobile devices. And various Express (i.e., free for non-commercial use) versions of Visual Studio can be used to get started in developing applications.

Arduino

The Arduino is a low-cost open source microcontroller board with on-board processor, memory, input/output ports, etc. It communicates to the host computer via a serial port although there are versions that have network and wireless connections. Many add-on boards are available. A bootloader loads the on-board flash program that is downloaded from the host computer, typically via a USB connection - which also serves to provide power to the device. A battery, or separate power source, can be added to power the device for remote applications. The installed program will run every time the device starts. A reset button allows the board to be restarted without disconnecting and re-connecting the power.

There are many sensors that can be added for input and/or output. Some devices such as the Nunchuck, used for the Wii, can be interfaced to the Arduino - which is less expensive than custom-building such a device.

A good way to get started is to purchase a kit that has an Arduino and many common parts and projects with which to get started. The author used the Sparkfun Inventer's kit but there are many

other good kits available. Some common parts with which to get started include LED's (Light Emitting Diodes), diodes, resistors, transistors, capacitors, etc. A multimeter, breadboard, and soldering equipment can also be useful.

The LilyPad is a minimal version of the Arduino that is intended for wearable computer applications.

The standard Arduino IDE is written in portable Java though one can a customized IDE. The Arduino IDE is useful for obtaining the exact command line commands needed to run a project which can then be replicated via the customized IDE. Like any Java-based project, setting up path hierarchies and access correctly is very important to getting the system to work. The Arduino software, with IDE, can be downloaded from the Arduino site at http://www.arduino.cc. The newer IDE, version 1.0, is a big improvement over previous versions. One improvement is the autodetection capabilities that make getting started easier.

The actual language used to program the Arduino is C++ with libraries to simplify access to the Arduino. Here is an example program - called a sketch.

```
#include <WProgram.h>

const unsigned int PAUSE = 1000;
const unsigned int BAUD_RATE = 9600;

int count1 = 0;

void setup() {
   Serial.begin(BAUD_RATE);
   Serial.print("Begin led-04\n");
   }

void loop() {
   count1++;
   Serial.print("\n");
   Serial.print(count1, DEC);
   delay(PAUSE);
   }
```

Like most such programs, there is a loop that runs continuously and events are detected and/or created within that loop. Diagnostics can be monitored via a serial interface.

Once the program is compiled, it can be uploaded and run (which happens automatically by the IDE).

In a custom configuration, the author uses the freely available plink software, part of Plink, to monitor the output of the Arduino board. Here is the command to start the serial monitor.

```
D:\E\PUTTY\plink.exe -serial -sercfg 9600,8,n,1,N COM11
```

Here is the start of the output from the Arduino board.

```
Begin led-04

1
2
3
4
```

Here is a more involved program that reads an input sensor from pin 7 while outputting to pin 13 to turn an LED on/off when the button is pressed.

```
#include <WProgram.h>

const unsigned int PAUSE = 1000;
const unsigned int BAUD_RATE = 9600;

int count1 = 0;
int state1 = 0;

const unsigned int INPUT_PIN = 7;
const unsigned int OUTPUT_PIN = 13;

void setup() {
   pinMode(INPUT_PIN, INPUT);
   pinMode(OUTPUT_PIN, OUTPUT);
   Serial.begin(BAUD_RATE);
   Serial.print("Begin led-02");
   Serial.print("");
   }

void loop() {
   const int INPUT_STATE = digitalRead(INPUT_PIN);

   if (state1 != INPUT_STATE) {
      state1 = INPUT_STATE;
      Serial.print(state1, DEC);
      }

   if (INPUT_STATE == HIGH ) {
      digitalWrite(OUTPUT_PIN, HIGH);
      }

   if (INPUT_STATE == LOW) {
      digitalWrite(OUTPUT_PIN, LOW);
      }
   }
```

Netduino

The Netduino is a plug-compatible version of the Arduino that is customized for the Microsoft Micro-Architecture Framework. It has more memory then the Arduino and can be programmed in C# using Visual Studio Starter Edition. The Micro-Architecture Framework is a stripped down version of the full .NET architecture.

The Netduino Plus has a wired network connection and can be used, with an Internet connection, as a web client, web server, etc. Many programming features are available in the Micro-Architecture.

Here is an example program.

```
using System.IO;
using System.Net.Sockets;
using System.Net;
using System.Text;
using System.Threading;
using System;

using Microsoft.SPOT.Hardware;
using Microsoft.SPOT.Net;
using Microsoft.SPOT;
using SecretLabs.NETMF.Hardware.NetduinoPlus;
using SecretLabs.NETMF.Hardware;

namespace rsDuinoCS {

   public class btDuino {

      public static int Main(string[] args) {
         int result1 = 0;
         WebServer webServer = new WebServer();
         webServer.ListenForRequest();
         return result1;
         }

      public class WebServer : IDisposable {
         private Socket socket = null;
         private OutputPort led = new OutputPort(Pins.ONBOARD_LED, false);
         public WebServer() {
            socket = new Socket(AddressFamily.InterNetwork
               , SocketType.Stream, ProtocolType.Tcp);
            socket.Bind(new IPEndPoint(IPAddress.Any, 80));
            socket.Listen(10);
            ListenForRequest();
            }
         public int count1;
         public void ListenForRequest() {
            while (true) {
               using (Socket clientSocket = socket.Accept()) {
                  IPEndPoint clientIP = clientSocket.RemoteEndPoint as IPEndPoint;
                  EndPoint clientEndPoint = clientSocket.RemoteEndPoint;
                  int bytesReceived = clientSocket.Available;
                  if (bytesReceived > 0) {
                     byte[] buffer = new byte[bytesReceived];
                     int byteCount = clientSocket.Receive(buffer
                        , bytesReceived, SocketFlags.None);
                     string request = new string(Encoding.UTF8.GetChars(buffer));
                     Debug.Print(request);
                     count1++;
                     string response = "Hello [" + count1 + "]";
                     string header = "HTTP/1.0 200 OK"
                        + "\r\nContent-Type: text; charset=utf-8"
                        + "\r\nContent-Length: "
                        + response.Length.ToString()
                        + "\r\nConnection: close\r\n\r\n";
                     clientSocket.Send(Encoding.UTF8.GetBytes(header)
                        , header.Length, SocketFlags.None);
                     clientSocket.Send(Encoding.UTF8.GetBytes(response)
                        , response.Length, SocketFlags.None);
                     led.Write(true);
                     Thread.Sleep(150);
                     led.Write(false);
                     }
                  }
               }
            }

         #region IDisposable Members
         ~WebServer() {
            Dispose();
            }
         public void Dispose() {
            if (socket != null) {
               socket.Close();
               }
            }
         #endregion
         }
      }
   }
```

A recent introduction is the Netduino Go - priced about $50. "*Netduino Go has four times the speed (168MHz), six times the code space (384KB), and twice the available RAM (100KB+) of Netduino Plus.*", from http://netduino.com/.

Create from iRobot

The iRobot Create is a low-cost robotics system with a large set of transducers for sensing conditions and taking actions. It is a non-vacuum cleaner version of the iRobot Roomba - itself a programmable robot. The iRobot Create has the vacuum cleaner removed to provide room for a cargo bay. Since it is not a vacuum cleaner, iRobot calls it iRobot Create rather than Roomba. However, one can use a Roomba for robotics work as it has the same interface to the control mechanisms. General robotics details are at http://spark.irobot.com, some of which applies to the iRobot Create.

One software support system is the Microsoft Robotics Developers Studio (RDS), now at version 4. A related support system is the Kinect for Windows SDK (included in RDS 4). The XBox video game system is not exactly a mobile system but Microsoft provides free tools to program the XBox, though a developers license costs $99 per year. It could be said that the Kinect for XBox helps make the user more mobile.

A disadvantage of the iRobot Create is that it uses a slow microcontroller, but, more importantly, has substantial memory limitations. To program the iRobot Create, commands are sent through a serial line. Sensor data can be read from the same serial line. The command module (the green box) makes this easier than using the traditional serial cable as USB support is provided via a USB cable.

iRobot recommends using an open source program called WinAVR - which provides a programming interface to the serial ports. WinAVR includes AVR Dude (apparently also part of the Arduino system). From the WinAVR documentation: "*WinAVR is a suite of executable, open source software development tools for the Atmel AVR series of RISC microprocessors and AVR32 series of microprocessors hosted on the Windows platform. It includes the GNU GCC compiler for C and C++.*".

Here are the project instructions from the quick start guide.

- 1. Open WinAVR
- 2. Create a new project and add the source files (e.g. input.c, oi.h and makefile from the input example program on the product CD)
- 3. Compile the project using Tools->[WinAVR] Make All
- 4. Connect the Command Module to iRobot Create and connect the USB cable from your PC to the Command Module
- 5. Press Reset on the Command Module
- 6. Download the project using Tools->[WinAVR] Program

For direct serial interaction with the iRobot Create, iRobot recommends the freeware RealTerm Serial Capture Program. Note that RealTerm needs to be run with system administrator privileges. RealTerm can be used to monitor any serial port activities, such as from the Arduino.

Lego Mindstorms Nxt 2.0

Lego Mindstorms is a robotic kit system where one builds models using Lego bricks and then customizes the creations with sensors and a microcomputer-based control system. The original Mindstorms stared life as an MIT project and was eventually migrated to Lego and has been improved and advanced over the years. The author tried version 1.0 of Lego Mindstorms which used a graphically-based programming system and had more limited alternative programming options.

The brains of the system is called the brick and controls input from and output to various sensors. Sounds can be generated and sensed, as can colors, motion, etc. There are many add-on sensors that can be integrated into projects.

Thus, one can use traditional Lego building techniques with the robotic brick and programming to make such systems more intelligent.

Projects are created as program code and downloaded via wired USB or Bluetooth wireless connections. Bluetooth is nice because it requires no wires. Lego supports a programming model based on Java. Since Lego has published the firmware and workings of the sensors, there are ports that allow many different language systems to be used. pbLua is a version of Lua adapted for Lego Mindstorms. There are many other custom languages that can be used, with varying degrees of effort, to program the Lego Mindstorms NXT. For those who prefer functional programming, Robotics.NXT is a Haskell interface to NXT that runs over Bluetooth. C# can be used with Visual Studio Express (free version of Visual Studio) and the Robotics Developer Studio.

The Robotics Developer Studio, through the Microsoft Visual Programming Language IDE provides a nice graphical alternative to the Lego Mindstorms proprietary IDE.

Raspberry Pi

A recent addition to the mobile computing market is Raspberry Pi. Raspberry Pi as a credit-sized board supporting a Linux operating system, USB for mouse and keyboard input, and HDMI and RGB video out. It was developed by a non-profit UK-based group that has targeted the teaching of computer science and programming using very low-cost hardware. The first versions were made available to a limited audience in Spring 2012 with more and improved offerings promised for Summer 2012.

The advanced Raspberry Pi, at an announced price of $35, has two USB ports (with embedded hub), SD card slot, Ethernet connectivity (10/100MBPS), 256MB RAM, SD Card slot, an ARM processor, and various Linux systems available via the SD card (not provided but software/data freely available).

Summary

This paper/session has presented some interesting mobile special-purpose computing devices that involve robotics technologies.

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Starting Early: Recruiting the Next Generation of IT Professionals

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Abstract:

Where can you find Harry Potter, a flying car in space, and Disney princesses all in the same place? You can find those along with many more at Purdue's computer animation camp. Last summer the inaugural camp was offered for middle school students and by all accounts it was a great success. Over the years at our Statewide Technology location of Purdue University at Columbus, we have developed many events to recruit the traditional and non-traditional student. The events and activities for the traditional students are generally geared toward juniors and seniors in high school when they start thinking about potential colleges. This past year we developed a computer camp for middle school students. Our goal was not only to let students and parents know we are here but to get them on campus and start building a relationship with them. With fierce competition for students and especially in information technology where enrollments are stagnant and in many cases declining, we felt it important to cultivate a relationship with these potential students. In this paper I will discuss the development and contents of the camp and evaluate the success of the first camp offered in the summer of 2011 and plans for future.

Introduction

Last June we opened our new Advanced Manufacturing Center for Excellence (AMCE) building in Columbus. This is the new home for Purdue University's College of Technology in Columbus. A very exciting time for Purdue and the first event to occur was the inaugural Purdue's Computer Animation Camp. Three days before the grand opening ceremonies, twenty one fourth through ninth graders came to campus for a four day camp to have fun and learn about creating animated programs. Fourteen boys and seven girls participated in a sold out camp. In this paper I will discuss how the camp came to be, how we developed the camp and the activities we covered. I will also discuss what we hope to gain from activities like the camp, the lessons learned and what we plan to do in the future with the camp.

Background

Believe it or not, the original idea for this middle school camp came from brainstorming ideas for recruiting students into our Computer and Information Technology (CIT) program in Columbus. First, a little background on Purdue's College of Technology and our program in Columbus.

Purdue University College of Technology (COT) has a statewide system that has programs throughout the state of Indiana. One of the goals is to make technology programs available throughout the state of Indiana. In Columbus we have the Organizational Leadership and Super-

vision (OLS), Mechanical Engineering and Technology (MET) and Computer and Information Technology (CIT). At each statewide site the College of Technology partners with a local college to provide non-major related classes such as Mathematics, Science, English, etc. In Columbus the partner is Indiana University Purdue University Columbus (IUPUC). The Purdue in the name is NOT the College of Technology but instead Science programs from IUPUC's main campus in Indianapolis. This causes great confusion in the community and even with students on campus.

Purdue College of Technology has its' own admissions, programs and recruiting activities in the community. This constant "identity crisis" is problematic in recruiting new students. Besides the identity issue we have also seen increasing competition in recruiting students from other universities in southeast Indiana and online programs as well. Our program has seen decreasing number of students over the last ten to twelve years. The CIT program has gone from a high of over 120 students to approximately 40 students in 2011-2012. This is not just an issue for our program but for other Purdue College of Technology programs in Columbus and other statewide locations. In the past several years there have been programs and locations closed. In fact our main campus program has seen decreases in recent years as well. In many respects we are in a fight for survival.

What we have found out over the years is that there does not seem to be a silver bullet when it comes to recruiting. As many universities do, we have tried multiple approaches, from advertising in newspapers, magazines, billboards and movie theaters to a multitude of face to face activities. Our Student Services visit all of the surrounding counties talking with students. We also have a variety of on-campus activities for students, parents, and counselors. All have had some degree of success but it is a constant battle. Most of the activities focusing on students were centered on high school students. They were generally students in their junior or senior year in high school.

One of the more successful activities we have had on campus in recent years does not focus on high school students but instead elementary and middle school students. The event is a robotics camps held in the summer on our campus. The camps are so successful that the MET professor who developed and runs the camps has organized multiple camps in the summer. These summer camps along with competitions during the year have gained publicity locally and at our main campus in West Lafayette. The activities seem to be a good way to help parents, teachers and students to realize we are Purdue in Columbus. Another goal would be that when these students start looking at colleges they will now know who we are.

Camp Concept

The success of the robotics camps caused me to brainstorm with local staff as to what IT might be able to do to appeal to a similar age group. In the summer of 2010 after throwing around several ideas, the idea of a hands-on type of computer camp seemed the most plausible. Our Purdue main campus had a high school program named SPIRIT, geared towards getting high school girls interested in information technology.

Part of the program involved using Alice software from Carnegie Mellon. According to the Alice website "Alice is an innovative 3D programming environment that makes it easy to create an animation for telling a story, playing an interactive game, or a video to share on the web. Alice is

a teaching tool for introductory computing." Also, at a previous ASCUE conference there was a presentation by Robert Sedlmeyer from IPFW entitled "Adventures in Computing for Teens: Revitalizing a Summer Exploration Camp." In that summer camp, geared towards high school students, they also used Alice. Based on this information, along with doing additional reading and experimenting with the tool, I thought this would be a good tool to use in the camp. My main concern was that most of the material I referenced involved high school students and I wanted to make sure it would work with a younger age group. After experimenting with Alice I was convinced we could use Alice for the sixth through eighth graders. One of the strengths of Alice was the ability to easily create 3D animation. I thought a computer animation camp might have more appeal to middle school students than calling it a programming camp, so I decided we would have a computer animation camp.

Camp Development

Once the basic premise of a computer animation camp was decided upon it was time to develop the details of the camp. How long, how to fund, where, how to advertise, how much to charge, how to handle funds? All of these are questions I needed to address since I had never developed a camp for middle school students. My first stop was Joe Fuehne the MET professor who developed the highly successful robotics camp in Columbus. This proved to be a very fruitful visit.

From those meetings many issues were resolved. We decided we might be able to save on a few costs if we ran the camps concurrently on our campus. The format for the robotics camp was a four day camp that ran 3 hours each day. Originally, I had thought about a 5 day full day camp but this would require added cost of providing lunches and providing enough content for thirty to forty hours. The robotics camp received all of its funding from camp tuition of $50 per camper. There was no support from local companies or Purdue (other than providing the labs). The expenses were for camp snacks, camp prizes, camp t-shirts, paper/copying used for advertising, expenses for support such as collecting the camp fees and providing workers to support the camp and with registration. The Columbus Center for Teaching and Learning (CTL) assisted Joe on many of the camps basic needs. The Center for Teaching and Learning at IUPUC has a mission to support learners of all ages and teachers in the Columbus area. The CTL provided the following services for the robotics camp:

- Developed a website to register campers
- Collected camp fees
- Worked with Joe to develop an advertising flyer
- Made copies of the flyer and distributed to all local schools in the county
- Purchased snacks and drinks for campers
- Purchased supplies for camp such as name tags
- Provided volunteers to help campers register each day of camp
- Helped with liability issues

The CTL was very supportive of the development of a computer animation camp. They agreed to provide the same assistance to the animation camp as they did for the robotics camp. This was a major relief for me because it allowed me to focus on the content of the camp.

Developing the content of the camp proved to be much easier than I originally anticipated. I had approached the SPIRIT group about adapting their content but they used textbooks and since we wanted to keep costs down and be at the same level as the robotics camp it was not a viable option. What was of great benefit was the Alice website www.alice.org. On that website was content developed by educators across the country. Most of it was free to use. I found material developed at Duke University that was free to use and turned out easy to adapt to our camp's age group and time allotments.

A final issue, where to have the camp? As I mentioned previously, our new Advanced Manufacturing Center of Excellence (AMCE) was scheduled to have a dedication in June 2011. We decided hosting a camp the week of the dedication would be a great way to open the facility. Our director agreed that it would be a great way to showcase the dedication of the building. So the camp was scheduled for June 7-10th with the dedication of the building on June 10th. We planned to use one of our new CIT labs with a capacity of 20 to 24.

Camp Implementation

Planning for the camp was finished in early 2011 and the flyers went out to all of the middle schools and high schools in Bartholomew County, shortly after spring break. By mid May the camp was sold out. With a full camp I hired a high school student, who had attended the Purdue SPIRIT camp, to help in the computer lab during camp. The first Purdue Computer Animation Camp ran June 7th – 10th. Camp ran from 9:00am to noon every day and the format was the following. I would talk for a short while about a topic in Alice, then give the camper an activity related to the activity, and then allow the camper time to explore. The first two days the campers worked on their own. On the third day I assigned the campers to teams and we had a competition. Students had to create a commercial and the winner selected from a table full of prizes.

Following is the daily agenda that was followed:

Tuesday

TIME	**ACTIVITY**
9:00-9:30	Introductions
9:30-10:30	Introduce Alice – start Part 1
10:30-10:45	Snacks
10:45-noon	Finish Part 1 and give students time to play with Alice Find the funniest animation on the web activity

Wednesday

TIME	**ACTIVITY**
9:00-9:30	Computer program activity make a peanut butter sandwich
9:30-10:30	Alice Part 2
10:30-10:45	Snacks
10:45-noon	Finish Alice Part 2 Have students create own world

Thursday

TIME	**ACTIVITY**
9:00-10:30	Alice Part 3
10:30-10:45	Snacks

10:45-11:30	Alice Part 4
11:30-12:00	Assign students to teams and create a commercial

Friday

TIME	**ACTIVITY**
9:00-10:30	Work on commercial
10:30-10:45	Snacks
10:45-noon	Demo commercial to campers and parents and prizes

Evaluating the Camp's Success

There are three criteria that I would like to use to evaluate the camp's success. First, did the campers have a good time and learn something in their time at Purdue last summer? Second, are we able to get people to realize that Purdue is in their community? Third, will this camp help in recruiting students?

In terms of the first criteria, did the campers have a good time and learn something in their time at Purdue last summer? The answer is yes. There were a few glitches such as the CTL did not check the age of the incoming campers and we had two younger campers that were a bit out of place in the camp. However, overall the camp was a resounding success. The CTL had the campers fill out a satisfaction survey on the last day of the camp. Campers had fun and learned at the same time. Some of the comments were that they would like to have an advanced camp, making commercials was fun, and they liked the prizes at the end. I talked to a few parents individually and they seemed pleased. A couple asked if I had thought of doing a full day session, and one like a camper asked if I would have an advanced camp this summer.

In terms of the second criteria , making people in the Columbus area aware that Purdue is there. It is still too early to tell. Like recruiting, this is an issue in which there is no silver bullet, and I think the answer is keep trying. We did get some exposure in the local newspaper which is a step in the right direction. A possible drawback is the CTL is now controlled by IUPUC and some of the information has both Purdue and IUPUC on it which does not help when trying to differentiate between the schools. We will have to continue to monitor this.

The third criteria, recruiting new students is still a few years away before we will able to see any results. The robotics camp is mature enough that they will start to see results in the next year or so. Most of the campers in the computer animation camp were sixth, seventh and eighth graders so we are probably at least three years away before we see any results .

Future Plans

At the writing of this paper we are planning for the second computer animation camp. The basic format is going to be the same, a four day camp meeting half days the first week of June. The only changes are a few minor tweaks in how money and applications are processed. Again, we will run our camp in conjunction with the robotics one. A potential off shoot of this camp is a one day camp for girls over the winter. Columbus area schools are going to a balanced schedule in the fall 2012. That will mean they will have more time off in the fall and spring. Many times parents are looking for things kids can do over these breaks. One of the areas we are always trying to improve is the number of females in our program. Currently, we have approximately ten

percent female enrollment in CIT. The numbers at the camp last summer were very good. A third of our attendees were girls as compared to a much smaller number in the robotics camp, so this idea may have potential. Another option we might look into is a possibility advanced camp. I think if this year's camp is a success we might look to add an advanced camp in the coming years.

Summary

We are very pleased with the first Purdue Computer Animation Camp. With a sold out camp and pleased parents and campers we plan to continue with the event. We are also looking into the possibly of expanding by offering advanced and specialty camps for girls in the next few years.

References

www.alice.org

Screencasting for Late Bloomers on a Budget

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Abstract:

If you have been wanting to explore the hows and whys of screencasting, then this show-and-tell session is for you. In our 45 minute time span, we will create and publish a narrated tutorial, as well as see many completed tutorials in multiple disciplines ranging from math, statistics, business, sociology, history, economics, shop class, bowling class, and many others shared by the audience. Geared towards \"noobies\" and more recent adopters, we will also discuss the usefulness of these creations to accomplish PREview, REview, \"lecture\" supplement and \"lecture\" replacement. The presenter will share his experiences in \"flipping the classroom\" where lectures are viewed at home and class time is spent entirely on online homework problem-solving and assessment. We will demonstrate hoe technology has helped personalize the classroom! We will also visit the work completed by students to help reinforce their comprehension and share their view with the rest of the class.

Presenter Bio:

Steve has been presenting numerous papers and workshops in the area of screencasting for over 17 years. He has been attending ASCUE for 18 years as well. He appreciates sessions where the participants walk away with something useful, at a price that does not require an NSF grant. He also makes some mean beef jerky!

Flip the Classroom – Revising the Role of the Professor

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Abstract:

Traditional approaches to higher education employ the \"lecture approach\" to some degree, with \"home\"work assigned outside of class. In the last few years, this paradigm has been \"flipped\" so that students view \"lecture\" material at home online, and do their \"home\"work IN CLASS. We have implemented a pilot study in a College Algebra section and will report on the first three semesters of Best (and worst) Practices. The discussion will NOT be discipline specific but some screen shots will be of the math class we have used in the pilot study. The techniques has been implemented across the curriculum with success. Session attendees will be encouraged to share their experiences as well.

Presenter Bio:

Steve has been presenting numerous papers and workshops in the area of screencasting for over 17 years. He has been attending ASCUE for 18 years as well. He appreciates sessions where the participants walk away with something useful, at a price that does not require an NSF grant. He also makes some mean beef jerky!

Implementing ePortfolios with Google Sites

Shawn Beattie
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Abstract:

Augustana College is a Google Apps for Education site. As part of the suite of applications, Google Sites allows for managed templates, student-created sites, commenting, and privacy control. Augustana has started utilizing this tool for an ePortfolio system at four levels: course, department, collegiate, and professional portfolios. This presentation will cover the reasons Google Sites is a good tool for this need, the technical limitations of Google Sites for this use, a brief overview of the template publishing ability, training and support strategies, integration with an LMS, and sample student portfolios.

Presenter Bio:

Shawn Beattie is Educational Technology Manager for Augustana College in Rock Island, IL. He graduated cum laude from Augustana College with a B.A. in Math and Computer Science and from Western Illinois University with an M.S. in Instructional Technology. He lives in Iowa with his wife, Kamy, and two children under two. He enjoys bluegrass music, and above all is a passionate follower of Jesus Christ.

QR Codes: Uses in Higher Education

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Tori Waskiewicz
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Abstract:

Quick Response (QR for short) Codes were originally created and used in the automotive industry in Japan. QR codes are now seen on many products you purchase and in newspapers. According to the Pew Internet & American Life Project May 2011 survey found one third of American adults own a smart phone and the growth of tablet ownership is on the rise. With more mobile devices in hand it makes sense to leverage the ability of QR codes in Higher Ed. Join us for an informative as well as creative session on making QR codes work on your campus. From digital storytelling to scavenger hunts, you will be able to create or take something back to campus.

Presenter Bio:

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 4th 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.

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. She 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.

Tori and Jean have presented at ASCUE before and enjoy planning for and participating in this conference.

The Future of Teaching and Learning

Wayne Bovier
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Abstract:

To support the teaching and learning mission on your campus, you need to satisfy both the teaching goals of the faculty and the learning needs of students – all at a reasonable cost. Ellucian has helped higher education institutions improve the efficiency of online learning and increase faculty adoption of the learning management system by more than 50 percent. Hear how Ellucian's technology vision supports the integration of academics and administration to provide faculty and students with greater flexibility, efficiency, and user satisfaction.

Presenter Bio:

Wayne Bovier brings more than 16 years of diverse experience in leading commercial software strategy, operations, and product development in the education, Internet, and telecommunications industries. Before joining Ellucian in August 2009, he served as Director of International Product Strategy at Blackboard, and has held a number of product executive and management positions at Broadsoft Inc. He also has held product management roles with Wired in San Francisco and with four start-up companies.

Managing the Five P\'s of a Project

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Abstract:

Managing a project can be a nightmare filled with potholes that delay implementation and create cost overruns. Join me in a discussion of the 5 P\'s which are critical to successful project management.

Presenter Bio:

Instructional Strategies for Online Teaching: A Design Course for Faculty

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Abstract:

Creating a course online can be an overwhelming task. How do you take traditional course content and place it online? How do you use the technology to enhance the instruction? Milligan College's faculty were asking these questions. The Instructional Strategies for Online Teaching course was designed and developed to help answer those questions. The course led the faculty step-by-step through the thought process of creating a course online along with developing an understanding of how technology could improve student outcomes. Faculty became the students and saw a different side to online learning while at the same time expanding their outlook of course objectives and technology within their instruction. The Instructional Strategies for Online Teaching course assisted the faculty to strengthen current teaching methods besides developing new ones. The three-week class gave the faculty a taste of online learning and online teaching. This presentation will cover design, development, implementation and evaluation of the Instructional Strategies for Online Teaching course. Examples of the faculty projects along with comments about the course will be reviewed. Designing an online course is never easy, and is particularly difficult when you don't know where to start. This course will help faculty find the starting point and point them in the right direction.

Presenter Bio:

Rebecca Burgner is an instructor for Milligan College\'s Computer Information Science program. Her focus of instruction is Web Design Theory. She has a Master in Education with a concentration in Educational Media & Technology. Other areas of professional interest include mobile technologies and instructional technology. She is currently, conducting research with iPads in Milligan\'s MBA program.

SCALE-UP Classroom Designs and Use: A close look at new SCALE-UP classrooms at Fayetteville Technical Community College

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Abstract:

One of the fundamental principles of education is the sharing of information. The world we live in has advanced in technology to a point where many tools can be used that makes sharing easier. This presentation will showcase new SCALE-UP (Student-Centered Active Learning Environment with Upside-down Pedagogies) classrooms at Fayetteville Technical Community College. The information will demonstrate how instructors are mixing technology with collaborative designs. The presentation will define what goes on during a typical SCALE-UP class, why some say the design works, what is meant by "upside-down pedagogies", which schools are deploying the pedagogical practice, and what subjects are taught using the design? Additionally, the presenter is a doctoral candidate at Liberty University who wishes to research the following questions using a quantitative experimental design: What are the effects of scale up classroom designs on developmental students in higher education? What impact does scale up classroom designs have on developmental students learning and achievement? Are some developmental students better suited for scale up classrooms than others? What impact does instructor proficiency have on developmental student learning? And does instructor feelings regarding technology impact student learning outcomes?

Presenter Bio:

Aaron Cox is the Public Service Division Chair at Fayetteville Technical Community College. He supervisors the following curriculum programs: Criminal Justice, Basic Law Enforcement Training, Fire Investigation Protection, Emergency Preparedness, Early Childhood Education, and Cosmetology. He teaches criminal justice classes. He has worked in the criminal justice field as a SC Highway Patrol, Military Policeman, Correctional Officer, Correctional Counselor, North Carolina Magistrate, and Criminal Justice Instructor in higher education.

(Re-)Designing an Engaging Online Course

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Abstract:

In recent years, there has been an increasing focus on student engagement (e.g., Pike & Kuh, 2009; Porter, 2009). Student engagement occurs when \"students make a psychological investment in learning. They try hard to learn what school offers. They take pride not simply in earning the formal indicators of success (grades), but in understanding the material and incorporating or internalizing it in their lives" (Newmann, 1992). To redesign an online social psychology course to be more engaging, we employed a number of different strategies and pedagogies. First, so that students would be more engaged with the material over the course of the week, there were multiple due dates, spread over time, for module assignments. Second, we created mini-projects for each module that required students to apply material from the module content. For example, one project asks students to write a description of themselves and then to ask a close friend to write a description of them as well. The student was then asked to submit both descriptions to Wordle and to provide an analysis . Third, students were required to engage with other students in a discussion forum, which had multiple due dates over the course of the week. Finally, the course included rich, interactive activities and videos that were designed to engage students with the material. In this presentation, we will share the process of course re-design, provide examples of the activities that we created for the course, and provide some data on the effectiveness of this redesign

Presenter Bio:

Beth Dietz-Uhler is a Professor of Psychology at Miami University. Her research focuses on computer-supported interaction, the use of technology in teaching and learning, and the scholarship of teaching and learning. She has been teaching online courses for more than 10 years.

Janet Hurn has taught physics at the Middletown campus of Miami University since 1990. She focuses her efforts on integrating technology in teaching and loves working with faculty interested in doing the same. She spends half her time working with faculty who are creating online and hybrid courses.

Helping Students Identify Information: An Investigation

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Abstract:

From their internet device of choice, students can search for and locate the scholarly information that faculty want them to use as well as the less-reputable or even dubious information that faculty want them to avoid. Learning to know the difference is essential, and being able to correctly identify different types of information like magazines, journals, newspapers, conference proceedings, websites, videos, discussion boards, and blogs is an important skill for students to develop. This skill is also part of the Association of Research and College Library's Information Literacy Competency Standards for Higher Education. While learning to identify different types of information may seem like a straightforward task, it can be overwhelming, especially for freshmen researchers who are often being introduced to academic information sources for the first time. This study looks at the ways freshmen students enrolled in three sections of a 1-credit Information Literacy Lab course identified and misidentified sources that they found online. By looking closer at the common problems that students encounter in identifying and evaluating online sources from the internet and library databases, faculty can develop classroom activities and assignments which will encourage and promote these important information literacy skills. Suggestions based on this research will be made to help faculty who are interested in building research assignments for students. Students who become adept at identifying and evaluating information will produce higher quality research projects throughout their college careers.

Presenter Bio:

Allison Faix is a reference librarian and the coordinator of reference services at Kimbel Library, Coastal Carolina University, in Conway, South Carolina.

BYOD Classroom Response Systems & Active Learning

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Abstract:

The presentation will begin with a brief overview of how mobile technology is currently used in higher education to foster an environment of active learning. Then, Top Hat Monocle will be used as an example of how these pedagogies are incorporated into the technology with things like polls and quizzes, interactive simulations, real-time discussions and gamification features. Lastly, data will be presented from case studies conducted by professors using Top Hat Monocle in their classroom and discuss its effects on student learning outcomes.

Presenter Bio:

Top Hat Monocle

Improving Online Course Performance Using Video Lectures

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Abstract:

The push to add computer science programs to online modalities has made a significant impact on teaching and learning at Columbus State Community College. Many faculty feel the quality of education is not as good in an online environment compared to a traditional setting, and that significant chunks of learning are not being transferred to the student. Regardless, because of work, family and convenience, our students want online programs and the world is changing rapidly such that if we don\'t offer them, someone else will. Since the future of education is certainly going to be made up of some amount of online learning, the answer is to create online courses with the highest quality possible. This means more than just putting traditional courses online with the required materials up on the website. Students want some measure of interaction with the instructor and ways to interact with the content. There are many techniques to create interactive materials using modules and media packages to replicate the best of instruction. This session will cover one necessary component of teaching--instructor lectures. We use Camtasia to create online voice-over lectures that can be streamed by students to any Internet connected device an unlimited amount of times. We will introduce and demonstrate creating and editing lectures for online use, and distributing the media packages for use by a variety of Internet connected devices. The methods will include demonstration of using software while the instructor explains the action occurring.

Presenter Bio:

Ty received his M. S. from the Ohio State University in 1995 and is currently working on a doctorate in Online Instructional Design. He is an associate professor in the Computer Science Department and is the coordinator of the department\'s MIS program.

Mary got her B.S. and M.S. in Computer Science from the University of Pittsburgh. Mary has been with Columbus State Community College since 1993 and is currently the coordinator of the Computer Science Department at the Delaware County campus of CSCC.

Innovative Strategies for Differentiating Instruction to Meet the Needs of Adult Learners in a Hybrid Learning Environment: Modeling What We Teach

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Abstract

The purpose of this presentation is to describe the process used to engage graduate students enrolled in an early childhood curriculum hybrid course in connecting theory, research and best practices in curriculum and instruction. Recommended guidelines for planning, developing, and implementing a graduate early childhood curriculum and instruction course in a hybrid environment will be delineated, including learner outcomes, course assignments, multimedia resources, guided online discussion topics, assessment and evaluation, and strategies for building an online learning community. Strategies for constructing guided online discussion topics to build on teachers' first-hand experiences and personal reflections will be provided. Differentiated instruction projects conducted in early childhood classrooms will be shared to demonstrate how developmentally appropriate instruction can be used to meet the needs of young children. Final reflections regarding the process used to teach early childhood curriculum and instruction in a hybrid environment will be presented.

Presenter Bio:

Dr. Catherine M. Gardner is a Professor of Education at Mercer University in Georgia. Her interests are curriculum, technology and early science and mathematics education. She has collaborated with peers to develop graduate hybrid teacher education programs for early childhood educators. She has published in peer reviewed journals and made numerous presentations at professional conferences.

Dr. Dana Lilly is a Professor of Early Childhood Education at Mercer University in Georgia. Her research interests include early literacy, family involvement, technology and early childhood curriculum development. She has published articles in peer reviewed journals, including Young Children. She has developed graduate hybrid teacher education programs for early childhood educators. She has also made numerous presentations at professional conferences.

Quality Matters at Coastal Carolina University: A Rollout

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Abstract:

In the fall of 2011, Coastal Carolina University became a Quality Matters Institution. Quality Matters is a faculty-centered peer review process for online and blended courses. Quality Matters began in 2003 out of Maryland Online as a part of a FIPSE (Fund for the Improvement of Postsecondary Education) Grant and has since become a self-sustained organization. Quality Matters has more then 530 subscribers and has become the benchmark for quality distance education courses. At the heart of the Quality Matters process is The Quality Matters Rubric that is built around eight general standard and forty-one specific standards. These standards can be used for faculty professional development or for formal course reviews sanctioned through Quality Matters. Although the necessary paperwork was signed for Coastal Carolina University to become a Quality Matters Institution, the university community at large was unaware of any change. It fell upon the TEAL (Technology in Education to Advance Learning) Center at Coastal Carolina University to raise awareness about Quality Matters among the campus community. The rollout was led by Jacob Bane, Instructional Designer, who is a certified Quality Matters Peer Reviewer and the Institutional Representative for Quality Matters at Coastal Carolina University. This session will include a brief introduction to The Quality Matters Program, detail the steps that were taken to raise awareness around Coastal Carolina University about Quality Matters, and the reception it received. The session will conclude with a time for questions and answers.

Presenter Bio:

Tracy Gaskin is the Senior Blackboard Administrator in The Center for Teaching Excellence to Advance Learning at Coastal Carolina University. Tracy handles the administrative tasks of Blackboard on campus and works one-on-one with faculty for technical support questions. Beyond Blackboard, Tracy designs and delivers faculty training and instruction. Tracy is a Quality Matters certified peer reviewer.

A Primer on Open Education Resources

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Abstract:

Open Education Resources (OERs) have garnered an enormous amount of press in recent times. But what exactly are OERs and where do they fit within the movement towards \"openness\" in higher education? In this session we\'ll talk about OERs, what they are, where to find them, how to create them and (most importantly) how you can use them for teaching and learning at your institution. We\'ll also explore the future of OERs and what changes to expect in the coming years.

Presenter Bio:

Andrea is an instructional technologies analyst at the University of British Columbia and is the current president of ASCUE. This year, she\'s been working with on a number of projects involving OERs and is looking forward to sharing them with you.

Could There Be Even MORE Cool Tools?

Janet Hurn
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Abstract:

Come see what I have found in the way of cool tools over the last year. This time I will be including iPad applications as well as my collection of web applications and free downloads. Learn how my iPad has become a crucial part of my everyday teaching and learning as well as my everyday activities.

Presenter Bio:

Janet has been attending ASCUE so long she has lost count. She is currently the Interim Coordinator of E-learning at the Miami University Regional campuses and is STILL finding cool tools.

e-Readers Revisited

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Gerri Jenny
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Abstract

This presentation is a follow up to a previous ASCUE presentation concerning Amazon\'s Kindle. Featured will be resources for e-Readers such as the Kindle, the Kindle Fire, and the ever popular iPad. Discussion will also include Apple\'s iBooks 2 educational initiative.

Presenter Bio:

Fred is a former ASCUE President ASCUE Member since mid-80s Computer Science & Education Departments at Grove City College, Grove City, PA. Employee at GCC since 1984

Gerri is an Assistant Professor of Early Childhood and Elementary Education at Slippery Rock University, Slippery Rock, PA. Teaching elementary education courses and supervising student teachers at SRU for 6 years.

25 years of Intelligent Agent Progress – From the Knowledge Navigator to Siri, Watson, and beyond

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Abstract

For 25 years, since the vision of the Knowledge Navigator was first unveiled in 1987, progress in the field of intelligent agent development has been a utopian goal, with progress occurring sporadically. Within the last year, however, much fanfare has been made about the emergence of several useful agents which provide real utility and provide evidence of great strides being made in the field. The emergence of true "intelligent" agents began with the all important CALO (Cognitive Agent that Learns and Organizes) research at DARPA (Defense Advanced Research Projects Agency) in 2003. This effort was designed to produce artificially intelligent agents that could reason, learn from experience, be told what to do, explain what they were doing, reflect on their experience, and respond robustly to surprise---quite an ambitions task. Today, several advanced Intelligent Agents, while not quite ready to totally automatically 'learn' as we do, are providing real value in finding, filtering, and fusing information. Whether searching, filtering, suggesting alternatives, or carrying out instructions, these agents are providing services heretofore relegated to humans. Running on a variety of platforms, including smartphones, Watson, Siri, and Denise, among others, are already solidifying their place as valuable augmenters of human capabilities. Starting with chatbots, such as Sylvie in 1998, we have followed and stayed involved with the development of agents, including some of our own, that can actually facilitate dealing with the information overload problem. This presentation will update the progress, utility and limitations, including several demonstrations, of the latest developments.

Presenter Bio:

A professor, Steve Knode has an extensive background in artificial intelligence, emerging technologies, intelligent agents, virtual reality, decision support systems, quantitative methods and decision making. He has published and presented papers in several areas, relating emerging technologies to decision making and problem solving. He maintains a website, www.steveknode.com, where he tracks emerging technologies. Further, Dr. Knode consults with government and private sector officials from the State Department, Department of Defense, Department of Veterans Affairs, among others.

J-D Knode is a marketing professor at Methodist University in North Carolina. Along with his teaching, J-D develops mobile phone applications and intelligent agent applications. He has started several new companies, including BotKnowledge, a small start-up firm for intelligent agent development. Further he is recognized as an expert in the use of social media and other web 2.0 technologies.

Hands-on Demonstration of the Finch Robot - Integrating Robotics in Introductory Programming Classes

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Abstract:

Keeping students engaged and motivated is one of the major struggles I face in introductory programming classes. The challenge is finding interesting, real-life activities that will work in whatever programming language is being taught. The Finch Robot, developed by Tom Lauwers, is inexpensive, portable to many current programming languages and fun for students. Our Intro to CS I, Intro to CS II and Visual Basic courses are ideal for using the Finch Robot. Students can learn coding techniques such as loops, selection statements and methods as well as advanced coding such as classes and abstract data types. This hands-on demonstration will allow participants to install the JES+Finch software and create programs that will run the Finch Robots.

Presenter Bio:

I received my Bachelor's degree in Psychology/Sociology from Northwest Missouri State University in 1975. After 8 years in retail, I returned to school and received my Masters degree in School Computer Studies from NWMSU in 1985. I started teaching at Avila January 1986. In 1989 I was promoted to Assistant Professor and I took over as Chair of CS. Fall 2012 will be our first offering of the Software Engineering major.

Volume Licensing Agreements and Education Consortia

Timothy Lilly
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Abstract:

This content will discuss how major software vendors view consortia, where there may be opportunity for ASCUE and/or for single state organizations to participate in volume licensing agreements, and suggestions for negotiating/uncovering new opportunities.

Presenter Bio:

Timothy W. Lilly National Consortia Manager Digital River Education Services, Inc.

Producing a Tech Tip of the Week Video Series

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Abstract:

It's hard to keep your campus community informed about all the rapid technology changes that can affect their every-day life. This session will explain the process we used at Sweet Briar College to produce a weekly tech-tip video distributed via campus email. No pricey equipment or software was necessary, just some help from a small number of motivated student workers. We'll discuss all aspects of this project, including: selecting topics; coordinating assignments; screen-capture; video editing; distribution, tracking and campus reaction. Through this initiative, we were able to help educate our campus about recent and upcoming technology changes with minimal effort. We'll even give you a sneak peak at some of our most popular videos, and show you how you can subscribe (for free!) to our Tech Tip of the Week Series!

Presenter Bio:

Tom Marcais is the Academic Technology Trainer & Consultant at Sweet Briar College. He is responsible for developing and delivering classes, presentations, workshops and consulting for students, faculty and staff in computer applications and technology supported at Sweet Briar College.

Sweet Success with Technology Training at Sweet Briar College

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Deb Meester
National Higher Education Sales Manager
Atomic Learning
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Abstract:

From staying up-to-date on the latest and greatest technology available, to engaging students in classroom through the use of technology, online training is the answer. In this session, learn how Sweet Briar College utilizes Atomic Learning to ensure technology training and support resources are never more than a click away.

Presenter Bio:

Tom Marcais is the Academic Technology Trainer & Consultant at Sweet Briar College. He is responsible for developing and delivering classes, presentations, workshops and consulting for students, faculty and staff in computer applications and technology supported at Sweet Briar College.

Solving the Electronic Annual Technology Budget Request Solution

Steve McKinney
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Abstract:

Stop by to learn how Moravian College and Moravian Theological Seminary (Moravian) developed an electronic solution for their annual technology budget requests. Moravian used to manually process their annual technology budgets with individuals submitting their own requests as Microsoft Word e-mail attachments directly to Center for Information Technology (CIT). This process proved to be very tedious and time consuming since CIT could receive over 100 individual requests that had to be consolidated and prioritized by CIT. Chairs, directors, and vice-presidents did not know what had been submitted since they were not involved in the request process. Moravian's solution: • Greatly simplifies the process, making the process much easier and quicker. • Eliminates paper; no need for Word documents or Excel spreadsheets. • Automatically builds next level of request. • Sends confirmation and status of request to requestor. • Integrates departmental academic chairs, administrative directors, and vice-presidents. • Generates a single electronic document consolidated at Institutional level for submission to the Planning and Budgeting Committee (PBC) for approval. With this electronic process, management at all levels must review and approve or deny each request from individuals and departments before that request can move to the next level. Electronic process requires: • Individuals and Directors/Chairs to complete an on-line request form and electronically submit it to Directors/Dept Chairs. • Directors/Chairs to review and prioritize applicable on-line individual requests and electronically submit them to VPs. • VPs to review and prioritize departmental requests and submit for compilation into PBC's campus technology budget request.

Presenter Bio:

Experience: Director, Center for Information Technology, Moravian College & Moravian Theological Seminary; Director, Education Technology, Army War College; Director, Information Systems Management, Department of the Army; Director, Systems Integration and Simulations, Combined Arms Center; Education: Chief Information Officer, National Defense University; Information Systems Security Professional, National Defense University; M.A., National Security and Strategic Studies, Naval War College; M.S., Systems Technology, Naval Postgraduate School; B.S., Engineering, U.S. Military Academy; A+ and Network+ Professional;

Technology Fairs: Engaging Faculty and Staff with Chocolate and Balloons

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Abstract:

Roanoke College has conducted two Technology Fairs (2010 & 2012) with the goal of introducing new technologies to faculty and staff in a fun and informative way. This session will describe how Roanoke College planned, promoted and hosted these successful & festive events. Roanoke College's Technology Fairs consisted of food, fun & prizes plus informative tables introducing new technologies and showcasing existing technologies.

Presenter Bio:

Mark Poore is the Director of Information Technology at Roanoke College. Before coming to Roanoke College in 1997, he held several IT positions in software development companies. He holds a B.A. from Roanoke College and an M.S. from Baylor University. Mark was a Fulbright Scholar to Germany. He likes astronomy, camping, contra dancing, and playing the cello, bowed psaltery and banjo (but not all at the same time).

Mobotrix Decentralized Video Surveillance Systems

Keith Romano
Mobotrix
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keith.romano@mobotrix.com

Abstract:

Megapixel CCTV cameras have changed the landscape of video surveillance. This requires innovation in hardware as well as processing of the video. The following presentation takes a look at decentralized concept architecture for a video surveillance system and the advantages it provides over the traditional centralized approach. This presentation will address the following subjects: - LowRes vs. HiRes - Cost Analysis - Flash Recording - Hemispheric Technology

Presenter Bio:

Mobotrix

Distance Learning Boot Camp: Building Quality Online Courses

Jennifer Marshall Shinaberger
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Abstract

Since July 2009, Coastal Carolina University's faculty technology development center has been offering a distance learning boot camp to faculty members. During this time, approximately 70 faculty members have been trained in ten sessions of our boot camp. This session will chronicle how this program has evolved from a face-to-face, week-long session in the summer to a variety of delivery formats to meet the needs of our faculty. Distance Learning Boot Camp is now available as a "mini-camp," a workshop series, in hybrid format, in webinar format and completely online. In September 2011, Coastal Carolina became a Quality Matters institution and the boot camp sessions were aligned to the Quality Matters rubric standards. Additionally a corresponding website (http://libguides.coastal.edu/distancelearningbootcamp) was developed through LibGuides on the Kimbel Library's website to make current version of documents available to faculty as a resource. Data will be presented on types of sessions and participant satisfaction survey results compiled from all boot camp sessions.

Presenter's Bio:

Jennifer Shinaberger is the assistant director of distance learning and the TEAL Center, the faculty technology development center, at Coastal Carolina University. She works with faculty in the development of distance learning courses and the integration of technology and is a teaching associate in the University's Spadoni College of Education where she teaches instructional technology. She has been in the field of education for 18 years and in faculty development for almost ten years.

Internet Peripherals Demo

M.J. Stinnette
Sweet Briar College
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Abstract:

Networks aren't just for surfing the web anymore! They can play a critical role in the academic environment. Our campus implemented several new network-based peripherals for education this year. I will either demonstrate or have examples of each of the following: • Apple TV • Google TV's and other network enabled televisions • Aver HVC310 HD Video Conferencing Solution • Wireless Projectors I'll cover many features and will share some specific examples of how we've taken advantage of this technology on our campus. Come learn how some of these products may revolutionize the teaching experience!

Presenter Bio:

M.J. Stinnette is the Campus Technology Lab Coordinator at Sweet Briar College. She is responsible for maintaining the AV equipment, hardware, and software in all the classrooms and computer labs on campus.

Decrease Your Physical IT Footprint/Costs Utilizing Virtualization Technologies While Keeping Up with Ever Increasing Performance and Capacity Requirements

Randy Stubstad
Mike Taylor
Tegile
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Abstract:

IT administrators in today's Higher Education Organizations are increasingly challenged to curb the exploding expansion of server and storage hardware footprints necessary to keep up with the growing reliance on technology by students and faculty. Many organizations are quickly adopting server and storage virtualization strategies to more efficiently manage this growth. This session will introduce a "hybrid" storage technology designed to balance the need for delivering the high performance and high capacity that virtual environments require while keeping costs within ranges Schools can afford. Roanoke College will discuss their success adopting this technology and how it has helped them reach their goals.

Presenter Bio:

SouthEast Regional Sales Manager, Tegile

Social Learning Best Practices: Increasing Student Engagement with Online Collaboration and Personal Learning Spaces

Emilie Udell
Learning Objects
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Abstract:

Social learning tools foster creativity, innovation, and encourage students to collaborate, communicate, and think critically; the goal of every educator and educational institution. Today's students, and educators, need tools for collaboration, personal learning spaces for individuals to collect and reflect on their course work and personal interests, and community areas for group projects, and departmental and administrative collaboration spaces. The social learning applications found in Learning Objects' Campus Pack, provide tools for users to create wikis, blogs, and podcasts for assignments or around personal interests, build a portfolio of academic work across time, and collaborate online with self-organized groups or campus. In this session, we will explore best practices and ways to use these tools in the classroom, as well as how to use a personal learning space to showcase academic and co-curricular work.

Presenter Bio:

Marketing Manager, Learning Objects

Mitigating Risks and Maximizing Benefits of the Open Source LMS

Chris Vanderbosch
Moodlerooms
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cvanderbosch@moodlerooms.com

Abstract:

MoodleRooms Vendor Session

Presenter Bio:

Marketing Manager

Mobile Web 2.0

Tori Waskiewicz
vwaskiewicz@ursinus.edu

Jean Bennett
jbennett@ursinus.edu

Ursinus College
601 E. Main Street
Collegeville, PA 19426

Abstract:

This session will cover web 2.0 applications and websites which allow the user to move freely between different devices, iPad, iPhone, Android, laptop, etc. Join us in our session to find apps/websites that will work for you, feel free to bring your favorites to share!

Presenter Bio:

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. She 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 4th 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.

Tori and Jean have presented at ASCUE before and enjoy planning for and participating in this conference.

Creating a Culture Using Social Media

Steve Weir
ASCUE
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Abstract:

We use the term \"culture\" or \"ethos\" often. What does it mean? How to create a culture? I believe there are three (maybe four) key ways to create a culture and we can use social media to help us do that.

Presenter Bio:

Steve Weir is the Website Coordinator and ad-hoc marketing guy for ASCUE. He wears too many hats to list, but he works to create cultures wherever he is. His more than 10 years experience in IT and Higher Education has provided him a unique set of experiences from which he learned many lessons. He holds a Masters Degree in Education and has taught as an adjunct professor at Philadelphia Biblical University.

A Unique Approach to Higher Education Technology Assessments

Jim Workman
Eruption Technologies
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Abstract:

It is vital to know whether an institution's technology is effective. Colleges and universities today are saying to themselves, "What we need is a way to assess our college's technology and a way to identify areas of strength and areas of greatest need." The CEATH Higher Education Technology Assessment (CHETA) is based on COBIT, an international standard for assessing technology in an institution of higher education. Learn about our unique TEAM approach and how an assessment may be of benefit to your school.

Presenter Bio:

Prior to starting Eruption Technologies Jim Workman spent 15 years at the University of Pikeville. During that time he lead elite groups of technology professionals in some of higher education's most challenging technology developments. As VP/COO of Eruption Technologies he brings that same expertise in problem solving to assist in all levels of client projects. Jim was a long time member of ASCUE and served on the Board of Director's in a variety of offices.

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