ASSOCIATION OF BUSINESS INFORMATION SYSTEMS

2009 Refereed Proceedings

Oklahoma City, Oklahoma

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1979	Reba Neal, Louisiana Tech University
1978	Reba Neal, Louisiana Tech University

ASSOCIATION OF BUSINESS INFORMATION SYSTEMS
Program

February 26, 2009
(Thursday)

8:30 a.m. – 10:00 a.m. Room 14

SESSION A Breakfast and Business Meeting

Yearly Business Meeting: Old and New Business of ABIS

Carla Barber, University of Central Arkansas, ABIS President

10:00 a.m. - 10:30 a.m. Ballroom C

FBD Coffee Break

Please make plans to visit the exhibits for information on the latest books & newest educational technologies.
Please let exhibitors know how much we appreciate their presence and continued support!
Drawings for a complimentary FBD 2010 & FBD 2011 registration fee only and an I-Pod
Must be present to win.

10:30 a.m. - Noon Room 14

SESSION A Students and Graduates & ABIS Distinguished Paper

Session Chair: **Margaret Kilcoyne, Northwestern State University**

Using Experiential Learning to Develop Communication Skills and Increase User Satisfaction with Student Developed Projects (Distinguished Paper)
Kimberly L. Merritt, Oklahoma Christian University
K. David Smith, Cameron University

A Correlation Study: The Effect of Online Quality on Student Learning Outcomes and Attrition
Joselina Cheng, University of Central Oklahoma
Lisa Miller, University of Central Oklahoma

Determinants of Well-being and Growth of University Graduates in US
Jacob Ogunlade, Walden University

Active Learning and Perceptions of First Generation College Students
Chynette Nealy, University of Houston-Downtown
Carolyn Ashe, University of Houston-Downtown

1:30 p.m. – 3:00 p.m. Room 14

SESSION A Pedagogy I

Session Chair: **Walter Creighton**, Northwestern State University

Can They Really Walk the Talk?
Margaret S. Kilcoyne, Northwestern State University
Julie McDonald, Northwestern State University
Brenda L. Hanson, Northwestern State University
Sue Champion, Northwestern State University
Margaret Garland, Northwestern State University
Glenn Maples, Northwestern State University

1:30 p.m. – 3:00 p.m. Continued Room 14

Protecting Information Assets: Attitudes and Actions of Business Students
Beverly Oswalt, University of Central Arkansas
Roslyn Lisenby, Southern Arkansas University
Sean Johnson, The Boeing Company

Teaching ERPs without ERPs
Michael K. Bourke, Houston Baptist University

Blogs: A View through the Lens of Business and Education
Marsha L. Bayless, Stephen F. Austin State University
Betty S. Johnson, Stephen F. Austin State University
S. Anne Wilson, Stephen F. Austin State University

3:00 p.m. – 3:30 p.m. Ballroom C

FBD Coffee Break

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Drawings for 2-night regular hotel room at 2010 FBD conference ($325 value) and an I-Pod. Must be present to win.

3:30 p.m. - 5:00 p.m. Room 14

SESSION A Pedagogy II

Session Chair: **Joselina Cheng**, University of Central Oklahoma

Is Compliance Enough to Suggest Accommodation – Do You Hear What I See?
Susan Evans Jennings, Stephen F. Austin State University
Matthew Evans Sutherlin, Stephen F. Austin State University

Communicating with PowerPoint the Right Way
Walter Creighton, Northwestern State University
Margaret Kilcoyne, Northwestern State University

Analysis of Improvement in Student Achievement when Teaching Excel and Access Using Screen Recorder Software
Carla Barber, University of Central Arkansas
Lea Ann Smith, University of Central Arkansas

Stop Grading and Start Teaching
Ian J. Shepherd, Abilene Christian University
Brent Reeves, Abilene Christian University
Darryl Jinkerson, Abilene Christian University

5:30 p.m. – 7:30 p.m. Ballroom C

FBD Swap Meet

Entertainment and fun

Bring something from your school (T shirt, coffee mug, etc.) to trade

Cash bar (with first drink free)

ASSOCIATION OF BUSINESS INFORMATION SYSTEMS
Program

February 27, 2009
(Friday)

8:30 a.m. - 10:00 a.m. Room 14

SESSION A **Technology Issues**

Session Chair: **Betty Kleen**, Nicholls State University

Cell Phone Etiquette
Amanda A. Jensen, Accenture
Bradley K. Jensen, Microsoft
Janet L. Bailey, University of Arkansas at Little Rock
Robert B. Mitchell, University of Arkansas at Little Rock

Video Technology in Computer Applications
Walter Creighton, Northwestern State University

The Invisible Guardian: Wireless Asset Control
Anthony Pistilli, Eastern Kentucky State
Marcel Robles, Eastern Kentucky State

COBOL: Excellent History and Great Future
Dayanand Thangada, Southern University at New Orleans
Adnan Omar, Southern University at New Orleans

Cross Culture Management, Transcendence and Empathy
William R. Venable, Oklahoma State University
Aswin Subanthore, University of Wisconsin-Milwaukee
Alfred F. Carlozzi, Oklahoma State University-Tulsa

10:00 a.m. - 10:30 a.m. Ballroom C

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10:30 a.m. – 12:00 p.m. Room 14

SESSION A **Disaster Recovery and Knowledge Management**

Session Chair: **Chynette Nealy, University of Houston-Downtown**

Disaster Recovery Plan for Successful Educational Continuity
Adnan Omar, Southern University at New Orleans
Devi Meenakshi Mantha, Southern University at New Orleans

Security Training Use of Color to Improve Recall
Bradley K. Jensen, Microsoft
Janet Bailey, University of Arkansas at Little Rock
Amanda A. Jensen, Accenture
Robert B. Mitchell, University of Arkansas at Little Rock

10:30 a.m. – 12:00 p.m. Continued Room 14

Knowledge-Sharing and Information Management in the Small Church: A Disaster Waiting to Happen?
Lynn R. Heinrichs, Elon University
Betty A. Kleen, Nicholls State University

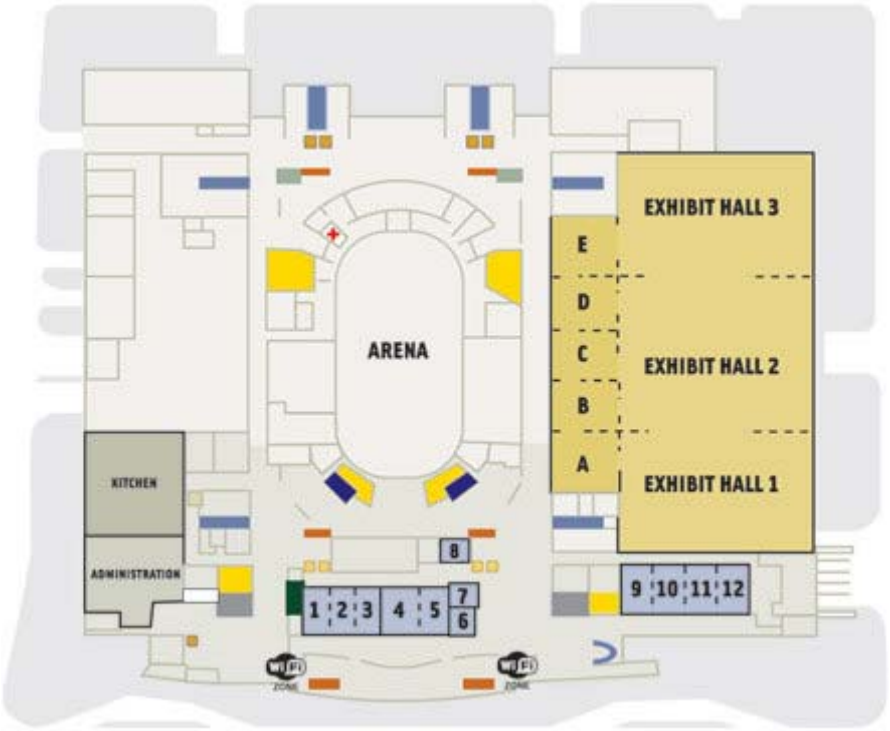
3:00 p.m. – 3:30 p.m. Ballroom C

FBD Coffee Break

Please make plans to visit the exhibits for information on the latest books & newest educational technologies.
Please let exhibitors know how much we appreciate their presence and continued support!
Drawing for an I-Pod.
Must be present to win.

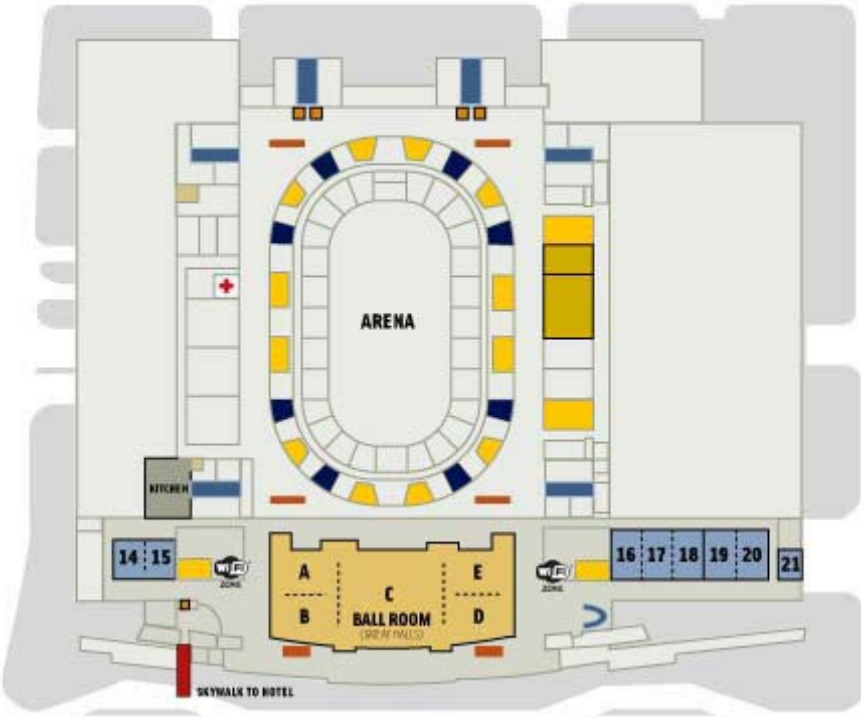
HOTEL FLOOR/ROOM MAP

Floor Map of the 1st Floor of the Convention Center Meeting Rooms



HOTEL FLOOR/ROOM MAP

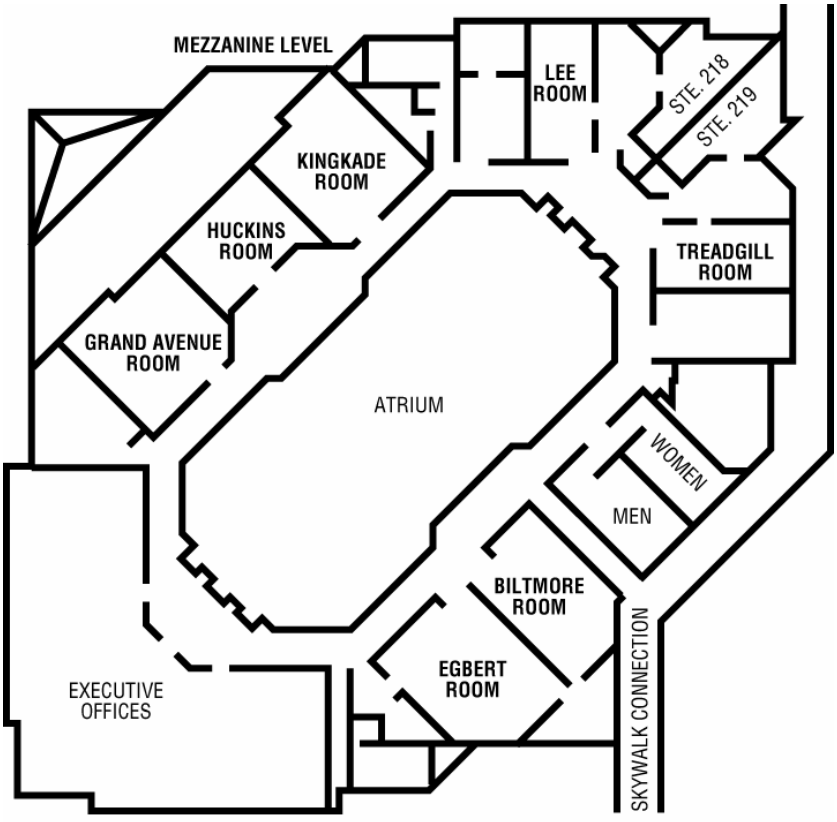
Floor Map of the 2nd Floor of the Convention Center Meeting Rooms



HOTEL FLOOR/ROOM MAP

Floor Map of the Renaissance Hotel Meeting Rooms

(on the 2nd floor of the hotel)



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USING EXPERIENTIAL LEARNING TO DEVELOP COMMUNICATION SKILLS AND INCREASE USER SATISFACTION WITH STUDENT DEVELOPED PROJECTS

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Abstract

This paper presents the experience of a regional university in implementing experiential learning in core MIS courses. In these courses students and clients must interact. The initial interaction is actually when the client describes the project scope to the students. Often, clients only have a vague understanding of what they want from the project, and often they have just a list of outcomes for the project. Students must use interview techniques and other communication methods to uncover more specifics, definitions of entities and attributes from the client's perspective, data flows, processes, etc. Additional opportunities to develop effective communication skills occur with project updates. This interaction with clients also ensures that the client will be satisfied with the final product. It is the experience of this university that the use of experiential learning improves the communication skills of students and increases system success as measured by user satisfaction.

Introduction

Preparing management information systems students (MIS) for successful careers is a complicated challenge. Students must be adequately prepared with technical skills in programming, database development, systems analysis, and much more. But that is not all. The literature is full of mandates to improve the soft, or non-technical, skills of MIS graduates as well. Students must be able to write, speak, present information and interact with others in addition to the broad range of technical skills required.

Many programs have implemented real-world projects in one or more of the required courses for IS students (Smith & Smarkusky, 2008; Mitri, 2008; Smith & Clinton, 2006) . This experiential learning reaps many benefits for students, universities, and businesses. In these projects, students often interact with actual clients to determine project requirements and complete systems development. In addition to the technical skills honed during this work, students are afforded opportunities to improve team-building skills, written and oral communication skills, along with interpersonal skills that are required for good user relations. These diverse skills are used throughout the project to ensure system success.

An important part of this process must be to increase students' understanding of system success. While technological functionality is vital, user satisfaction with the system is paramount (Chen, Soliman, Mao, & Frolick, 2000). Student projects completed thought experiential learning must ensure the developed system meets the needs of the final user, or client. By increasing the importance of user satisfaction, students are encouraged to focus on the communication and interaction with the users as much on the technical functionally of the product.

This paper presents the success of one regional university's MIS program in developing student's communication skills by requiring experiential learning in two of the required courses. This experiential learning requires students to work in groups,

communicate with end-users, and develop a system to the end-user's satisfaction.

Literature Review

Importance of Communication Skills

Social / interpersonal skills (sometimes called "soft skills") are ranked high by employers as a criterion for job seekers. Social skills include teamsmanship as well as oral and written communication skills. However, they also include the ability to present findings, the ability to listen and draw conclusions, and even understand body language. Lee (2005) indicated that over three quarters of job ads state a requirement for communication and interpersonal skills. Fang, Lee, and Koh (2005) further this thought by stating that "With regard to the most important factors in full time hiring decision, 40% . . . chose the communication skills followed by [other skills]" (61). They further indicate that Team Skills rank only slightly higher than communication skills for an Entry-Level IS Employee.

User Satisfaction

Since the adoption of information systems in business, the topic of system success has been studied. DeLone and McLean (1992) identified six major categories of IS success: system quality, information quality, use, user satisfaction, individual impact, and organizational impact. As systems developed, additional factors of ease of use, end-user perceptions, and available support were added as important factors. However, user satisfaction is considered to be the most useful measurement of system success (Chen, Soliman, Mao, & Frolick, 2000).

Benefits of Experiential Learning

Benefits of experiential learning accrue to the students involved, the university that provides the opportunity, and to the business that benefit from it. Students reap many benefits from the experience, including: improved concept recollection and student outcomes (Polito, Kros, & Watson, 2004); critical thinking and problem-solving skills (Kinsley, 1994); the ability to apply knowledge to related situations (Roberts, 2003); higher levels of student interest and motivation resulting from working on a hands-on project (Elbert and Anderson, 1984; Kinsley, 1993); and improved oral and written communication skills (Harris, 1994). Many authors recommend experiential learning projects as an excellent way to improve student creativity (Cougar, 1995; Gose, 1997; Jacoby, 1996).

The university also benefits from experiential learning. Through constant interaction with the business community, the university strengthens relationships with employers and garners real-world experience for faculty and students (Cooke & Williams, 2004; Fox, 2002; Hervani & Helms, 2004; Stanton, Giles, & Cruz, 1999). Research has shown that additional benefits include improved classroom practices (Richards & Platt, 1992), instructional productivity (Johnson, Johnson, & Smith, 1991). It allows teachers to challenge their students (Wedel, Behnezhad, & Gray, 2004) and assists the professor in remaining current in his/her field (Cooke & Williams, 2004). Experiential learning enhances the quality of the education a university offers.

Through this experience, businesses are able to collaborate with the university and evluate potential employees (Fox, 2002; Schuldt, 1991). Student thinking is shaped by the interaction with the business professionals. For the business, working with the students has many of the benefits of hiring an intern (Cooke & Williams, 2004). Additional benefits to business are the valuable expertise of the instructor, the energy of enthusiastic students and the cost savings reaped from not paying consultant fees.

Experiential Learning at Regional University

Program History

Regional University started a Management Information Systems (MIS) specialization in the School of Business in 2000. As part of the MIS curriculum, two of the mandatory classes developed centered on database creation. The first of these courses, Database Management (DBM) had its first class scheduled in the Fall 2001 semester. The DBM class was to be conducted every fall according to the rotation schedule. In the first DBM class, the instructor used a "canned" exercise for the class project and used Oracle Designer as the CASE tool for the class. Students were less than thrilled with both the project and the CASE tool. The project, which dealt with a fictional library, had an easy solution and consequently did not really challenge the students. The CASE tool, a student version, tended to lock up student home computers and even the computers in the School of Business lab had to be rebooted at least once during each class session. Shortly after this experience, the University purchased a full-version CASE tool (System Architect®) for use by students in the development courses.

Early in the 2002 academic year, the DBM instructor was approached by the School of Business Dean of Graduate Studies and asked to create a database to track MBA students and to cut down on amount of paperwork managed by the office. The instructor initiated an experiential learning exercise to complete a fully functional database solution to the stated problem.

This project was a tremendous success, as evaluated by both students and client. Students not only enjoyed the project, but also left the class with letters of recommendation from the Graduate Dean. The student product was very well executed and the client was very happy with the functionality of the resulting database. Based on this, the instructor decided to incorporate experiential learning in all the DBM classes and also instituted it in the Applied Problems in MIS (Capstone) class for all MIS majors.

Benefits were readily apparent in all classes. These included the following:

1. Students that worked on an actual project for actual clients had improved quality of work. This may have been due to the fact that student teams (students in each class were assigned to design teams) were competing to "win" the contract to build the database. Consequently, students spent more time working on the project than they had with the canned exercise. As such they left the class with a deeper knowledge of the subject area.
2. Students were able to practice and increase their oral and written communication skills. One of the criteria for being selected as the class project was that clients had to make time to meet with the database teams. This was required to ensure the students fully understood the definitions and business rules which would allow them to work through the various models used in database design. It further worked to make sure each implemented database had the required functionality. Students also had to present In Process Reviews (IPRs) at specified times. Every student in the team was required to participate. The audience for the IPRs was the instructor and the clients. During these IPRs, students had to completely update the client as to the status of the project, let the client know what would be coming next, and to ask for any clarification that might be required by the team to complete the next phase of the project. If the client was unavailable, students either made appointments to see the client, or used telephone or email to communicate.
3. Students worked in teams. Students actually graded the members of their team on teammanship and a portion of their grade was determined by team members. Additionally, students conducted counseling on students that

were not participating, and had the option after counseling of recommending to the instructor that the team member not participating be fired. Throughout the process, students became very proficient at meeting management.

Project Success

Since that first database was created for an actual client there have been numerous projects completed by students. The application of experiential learning has also been made to MIS internships in the program. A listing of these projects, including client information and description of the project is provided in Table 1.

Discussion

The success of the project often appeared to be determined by the amount of contact between the client and the students. Table 2 shows the amount of client contact, main method of contact and the overall success of the project. A Likert scale of 0 – 3 was used to show client contact level. For Contact Level the following weights apply: 0 – Clients were unable to meet with the students and communication was conducted only through email and telephone. 1 – Clients only met with the student once prior to final presentation and communication was almost entirely through email and telephone. 2 – Clients met with the students twice prior to the final presentation. Email and telephones were also used to communicate. 3 – Clients met with the students three or more times prior to the final presentation. Success of the project was determined by focusing on user satisfaction along with the amount of functionality in the database. A Likert scale of 1 – 4 was used with the following weights: 1- low functionality, client unable to use; 2 – low functionality, client still able to use portions of the database; 3 – most functionality present, usable; and 4 – fully functional, usable.

Chart one shows a scatter plot of the data from Table 2. The Correlation Coefficient of the scatter plot is .443. This indicates that there is a positive correlation between client contact and success as measured by user satisfaction.

Conclusion

Using experiential learning in the fashion described in this paper forces students to develop many skill sets other than just the technical skills that the class covers. In order to ensure client and student satisfaction, as well as ensure the database has the proper functionality, students must work together in a cohesive team, and they must develop good social / interpersonal skills, and effective oral and written communication skills. Without these, the project will not have the functionality required by the client, and students will not have all the skills required by employers. It is the experience of this university that the use of experiential learning in core MIS courses improves the communication skills of students and increases system success as measured by user satisfaction.

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Table 1: Project Listing by Year

Project Name	Class	Semester	Year	Description
MBAU	DBM	Fall	2002	Develop an application to maintain information on students; instructors; courses; grades; comprehensive finals; and course sites of the graduate school of business MBA program.
Contracting Company INC	CAPSTONE	Spring	2003	Create a database tool (COTS preferred: Access (cheap and ubiquitous) to combine a several user interfaces with a report generating output specifically for DoD business developers. The user interfaces will summarize the status of impending opportunities for executives, supervisors, capture managers, proposal managers, and other writers. I would really like it to be available at a secure website for information collaboration.
New Hope Volunteer Fire Department	DBM	Fall	2003	Create a database to track the following for the New Hope Volunteer Fire Department: training events, number of hours required for that training, and those who have completed the training and on what date; dates and locations of fires runs in the district; member and auxiliary member personal information; equipment and service dates for that equipment as well as hand receipt information; an events calendar is an item that would also be of interest to NHVFA, but is an optional item; and have the ability to print out applications for membership.
BSA Camporee	CAPSTONE	Spring	2004	Develop a more user-friendly relational database system for monitoring and maintaining records regarding the BSA Camporee. The new system must maintain all data currently in the current system and allow new information to be added to the database. Additionally, it must meet all the functionality of the current system and provide an easy to use GUI interface. Additionally, it was requested that **IF POSSIBLE** certain information, like registration application forms, from the current system be added to an online environment.
BSA Camporee	Intern	Summer	2004	Complete BSA Camporee DB
Southern Sales	DBM	Fall	2004	Create a database that has the ability to do the following: track weekly sales and inventory; print out a forecasting sheet (similar to the one provided); compute weeks of inventory based on sales and inventory; print out an exception report on items that have gone below inventory stocking levels; store vendor POC information; track transfers of inventory between three

				locations; and provide sales comparisons between products.
Regional University School of Business Scheduling	DBM	Fall	2004	Develop a database that has the ability to: print out a Course Schedule sheet for the appropriate semester as well as labels for placing on the master board; print out an exception report on multiple book resources (rooms); print out a teaching load report; print out the Student Rating Envelope instructions; print a semester class schedule and office hour report; print a semester room schedule; and print a calendar to be used for school events.
LPHS Special Education Resource LAB	CAPSTONE	Spring	2005	At a minimum, the LAB coordinator would like to be able to accomplish the following activities more effectively: document the ineligibility reports; log parent contacts; ensure the special education student to teacher count does not reach a certain limit for each separate class (must be completed in a by name fashion); monitor modifications of students and ensure general education teachers are notified of all modifications; provide monitor progress (and email it to general education teachers); log participation in the LAB and what modifications were used; monitor calendar reports – using school calendar; ensure IEP and Re-evaluation deadlines are not missed; and possibly input and report 10th of the Month reports
Regional University School of Business Scheduling	Interns	Summer	2005	Complete the Fall 2004 School of Business Scheduling database
LPHS Special Education Resource LAB	Intern	Sumer	2005	Complete the LPHS Special Education Resource LAB database
Regional Hospital Respiratory Dept	Intern		2005	Create a tracking database for the respiratory unit of a local hospital
EHomes LLC	DBM	Fall	2005	Create a database that tracks the following information: information on the rental units; information on tenants; information on rents collected and rents overdue by rental unit; expenses by rental unit; supplier/contractor information
Regional University Academic Research Center	CAPSTONE	Spring	2006	Create a database to track how courses from regional university track with other colleges, technical centers, etc. within the state.
Canned Project	*DBM*	*Fall*	*2006*	*Did not find a service-learning project for this semester.*

EHomesLLC	Intern	Summer	2006	Complete the Fall 2005 EHomesLLC database.
WOSC Flight School	DBM	Spring	2007	Specific areas that WOSC Flight database had to track were: the students' names, email addresses, & other contact information, etc; courses; sections offered by semester and year; flight hours and dates; aircraft type; flight Instructors, email addresses, & other information; possible other information; the ability to track the students' courses and flight hours; which flight instructors are flying with which students; flight schedules; and must have security
LPHS Alumni Association	CAPSTONE	Spring	2007	Create a database that allows LPHS AA to track the following: alumni: all pertinent information; years attended or year graduated; extracurricular actives, organizations, clubs, sports along to include significant offices or positions; outside school activities; occupation information; post LHS education information; post LHS education extracurricular activities; and other areas per client's request.
LPHS HOPE	DBM	Fall	2007	Create an application that tracks students in HOPE. The system must have reports that do the following: calculate each student's time in HOPE; calculate the number of students served daily, weekly, monthly, throughout the school year; provide, on a student by student basis, when each student was in HOPE; track Homework assignments received by HOPE personnel and when they were returned; track parent calls; an email capability to notify individual or groups of teachers of progress of the student / or to notify that assignments were sent, etc.; an assignment submission slip request; a bathroom log; and others reports as required based on interviews, etc.
GNHA DIST 98	DBM	Spring	2008	Create an application that can be used to track the following information: riding clubs; riders; horses and coggins tests; playday event results; points earned by contestants; dues; and who is eligible for finals. Mandatory Reports include: 1st - listing the placement by age groups at District Events, 2nd - listing the number of district play days riders have ridden in (for Finals), 3rd - district placings (for awards at the end of the season and to see who qualifies for finals).
STATE EMERGENCY MANAGEMENT AGENCY	CAPSTONE	Spring	2008	Create an online database that tracks for all towns and counties in the state: emergency managers; assets; emergencies; training for emergency managers; grant programs counties and cities/towns participate in
LPHS HOPE	Interns	Summer	2008	Complete the Fall 2005 LPHS HOPE DBM

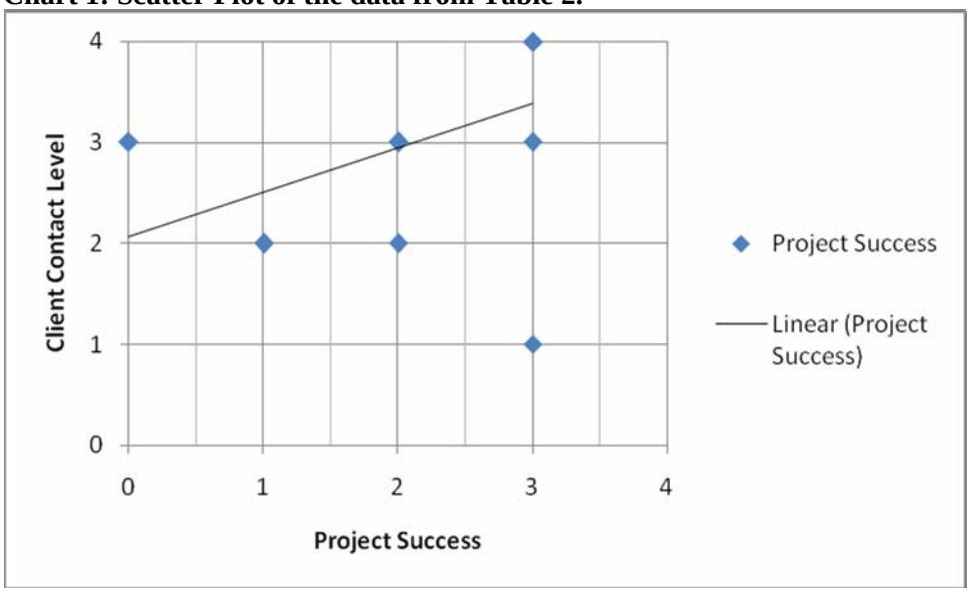
LPHS SPECIAL ED TESTING DB	DBM	Fall	2008	Create a database to track EOI testing for LPHS special education students. On going.

Table 2: Communication Between Client and Students

Project Name	Client Contact Level	Project Success	Client Currently Using Database	Comments
MBAU	3	4	No	Overseas portion of MBA program was terminated. Database was shared with other associated MBA distance offices and may be in use there.
Contracting Company INC	3	1	No	Instructor chose a project that was too complicated for the class. Client did say that the product was complete enough for him to fix it.
New Hope Volunteer Fire Department	2	3	Yes	
BSA Camporee (to include Internship)	2	3	?	May have used it for one camporee. It was placed on their server
Southern Sales	1	2	?	Client did say that it was usable and that he'd play with it
Regional University School of Business Scheduling (Plus Internship)	3	4	Yes	Was shared with several departments at the Regional University, but unsure whether they used it or not
LPHS Special Education Resource LAB	3	4	Yes	Has been shared with several schools in the district
Regional Hospital Respiratory Dept.	3	4	Yes	Has been estimated to save the Hospital over $10K each year
EHomes LLC (to include internship)	3	4	No	Client has assured the instructor that they intend to use it, but to date they are still relying on spreadsheets
Regional University Academic Research Center	2	2	No	Students met with the client at his office on at least one occasion.
Canned Project	n/a	n/a	n/a	n/a
WOSC Flight School	1	2	No	Flight director quit and moved to another job

LPHS Alumni Association	3	4	No	Alumni association wants to put the database on line. They are using this database as a template to do so
LPHS HOPE (to include internship)	2 (Chair only)	3	No	New teacher may implement next year.
GNHA DIST 98	1	3	No	
STATE EMERGENCY MANAGEMENT AGENCY	3	3	Partially	Decided to go with a packaged product with more functionality. Database has been turned over in Access form for use by individual regional manager and other managers until the new system is up
LPHS SPECIAL ED TESTING DB				Ongoing

Chart 1: Scatter Plot of the data from Table 2.



CELL PHONE ETIQUETTE: WHAT PEOPLE SAY AND WHAT PEOPLE DO

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Abstract

Most people have been in a location, such as a movie theater, a library, or even a restroom, and heard someone talking on a cell phone. Do individuals not involved in the call find it rude? Do the individuals taking calls find this action to be rude? Have these individuals set a double standard: do they consider others rude for taking a call but consider it okay to take a call themselves? Is society split on the issue, with some individuals finding it rude and others finding it perfectly acceptable? Is the reaction gender dependent? To answer these questions, the researchers created and distributed a survey to 336 students at two southern universities. The findings suggest that even when a low percentage of individuals think it is acceptable to take a call in a specific location or situation, most have done so anyway. A surprising number of additional unexpected and inappropriate locations or situations where cell phone calls have been taken were also reported. Suggestions for methods to address the problem through activities in introductory information technology and business communications courses are presented.

Keywords

Cell phone etiquette, rudeness

Introduction

Rudeness has been defined as "insensitive or disrespectful behavior enacted by a person that displays a lack of regard for others" (Porath & Erez, 2007). While this is a concept with an element of subjectiveness to it, there are certain activities most people would agree are rude. Take for instance the following story. A young man being waited on by one of two tellers in a Toronto bank took a cell call and proceeded to walk out to speak with an individual in a car parked by the front door. This left the teller helpless to complete the transaction while a line of 20 people waited their turn. Upon his return, many of those in line demanded he go to the back of the line only to have him refuse (Dell, et al., 2004).

Most upon reading that story, and certainly those who were in line at the time of the incident, would agree the man was rude. In fact, the incident was selected as an exceptional illustration of rudeness among hundreds of reader responses to a request for examples of ill-mannered behavior (Dell, et al., 2004).

Rudeness is not just confined to isolated instances. In a Public Agenda research group survey of 2,000+ adults, 88 percent of respondents said they "often or sometimes come across people who are rude and disrespectful," while only 48 percent "often see people who are kind and considerate." (Dolliver, 2002) Examples of rudeness can be found in the American entertainment industry with shows like "South Park," "American Idol," and radio host Howard Stern. However, just because it is common and often used for entertainment value does not mean people are not bothered by it. In the same Public Agenda survey, 62 percent said rudeness "bothers them a lot" (Dolliver, 2002) and 79 percent of respondents said a

lack of respect and courtesy in America is a serious social problem that should be addressed. Two-thirds reported the problem has worsened in recent years (Estell, 2002) with 61 percent of respondents under 30 in a survey by the Princeton Survey Research Associates reporting the opinion that Americans are rude (Russell, 1997).

Impact of Rudeness

What does this prevalence of rudeness mean? Rudeness can have a significant cost on a business. In one survey nearly half the respondents indicated they had walked out of a store in the past year due to poor service (Estell, 2002). However, the largest cost is what occurs inside a company. Rude employees and managers can cost a company millions of dollars a year. Rudeness can not only result in an unproductive culture and turnover (Folds, 2007) but also in lost time. According to Accoutemps, executives from Fortune 1,000 companies reported spending 6 ½ weeks a year, on average, resolving personnel conflicts. In the extreme situation where a conflict escalates to the point where people take legal action, the cost to the company can range anywhere from $100,000 to $250,000 in attorney fees and court costs, not including any potential awards. While saving on court costs and negative publicity, settling out of court is often expensive (Johnson & Indvik, 2001).

One of the most thorough studies of rudeness in the workplace was conducted by the Kenan-Flagler Business School of the University of North Carolina at Chapel Hill to assess fallout from office rudeness. Seven hundred seventy five workers participated. They found the cost of disrespect to be as follows:

- Twelve percent switched jobs for a more pleasant environment.
- Forty-six percent considered changing jobs.
- Twenty-eight percent reported lost productivity due to measures taken to avoid a rude coworker.
- Fifty-three percent reported lost productivity due to worrying about a past or possible future incident with a rude coworker.
- Twenty-two percent reduced their work effort.
- Thirty-seven percent reported lower commitment to their organization (Rudeness Damages Productivity, 2000).

A study conducted in Singapore regarding email incivility on the part of supervisors resulted in the following findings:

- Sixty-five percent reported they would be unwilling to have their supervisors continue as head of their group/department given a choice.
- Sixty-one percent were dissatisfied with their supervisor's performance as a leader.
- Sixty percent opposed rather than supported their supervisor.
- Sixty-three percent admitted to frequent consideration of a job change.
- Forty-four percent stated they would *probably* look for a new job in the next year.
- Thirty-eight percent said they *would* actively look for a new job in the next year.
- Sixty-two percent admitted that they did not care about the fate of their organization.
- Sixty-one percent told their friends their current place of work was not a great organization to work for (Kim, Teo, & Chin, 2008).

Rudeness has lasting effects. In fact, a study where participants were primed for rudeness using a sentence scrambled test showed participants who had been primed for rudeness were more likely to interrupt the experimenter more frequently and more quickly than individuals who had not been primed for rudeness (Bargh, Chen, & Burrows, 1996). This behavior is witnessed everyday when one bad incident or run-in causes an individual to snap at someone else. For example, a person who is feeling

mistreated may snap at individuals who are trying to help them. Passengers delayed waiting for a flight may yell at the airline representatives as well as each other although none of these people are directly, or indirectly, responsible for the delay.

A study conducted by the University of Southern California and the University of Florida showed that an act of rudeness can affect much more than whether an individual will be rude to someone else. The study showed that even one-time incidents of rudeness can leave individuals so flustered they lose much of their problem-solving and creative talents. The study showed that an act of rudeness affected participants' task performance, creativity, flexibility, and helpfulness. In fact, the process of just imagining a rude incident reduced routine as well as creative and flexible performance (Porath & Erez, 2007).

Unfortunately given the high cost to companies, rudeness and bad manners have become common in the American workplace. A survey done by a University of Michigan researcher found that 71 percent of workers had been treated discourteously by either their co-workers or their superiors (Missed Manners, 2001).

Businesses are taking steps to address rudeness in the workplace. The number of businesses hiring professional etiquette teachers to instill better manners in their workers has grown in recent years. A firm called At Ease Inc., a Cincinnati-based franchisor of classes on business etiquette, saw a 34 percent increase in their business during 2004 in "rudeness-reduction training." They had clients ranging from an Ivy League University to a consulting company to a law firm (Clash, Barrett, Smillie, Novack, & Weinberg, 2004). Rosanne Thomas, an etiquette consultant in Boston, reported a ten-fold increase in business between 1995 and 2000. Her specialty is working with technically brilliant but socially-challenged employees. "These young people know their jobs very well but they don't have the basics such as how to introduce themselves, how to wield their forks and knives, how not to offend people" (Jeffrey, 2000).

Rudeness and Technology

According to the Cellular Telecommunications Industry Association, 262.7 million people subscribe to wireless services (Wireless Quick Facts, 2008). As a result, cell phone war stories are growing in number. As unbelievable as it sounds, one presenter reported a front-row audience member literally crawling under a table to answer a call. In the middle of a lecture at the College of Charleston in South Carolina, the professor watched a student leave class when her phone rang; upon returning, the student felt compelled to let the professor know it wasn't an emergency, she was just "keeping in touch." The situation was reversed at a Milwaukee campus when a business student nervously gave an in-class presentation worth 20 percent of his grade while his professor talked on his cell phone (Hill, 2000).

Technology has far outstripped social norms. Before society mastered email etiquette, cell phones appeared. Not only have technological advances allowed work to become 24/7 – a concept embraced by the business world but not completely by society, they have also outpaced social conventions.

This generation is not the first to witness technology outpacing etiquette. The introduction of the telephone was fraught with issues. Callers had to determine if it was appropriate to contact someone they had never been introduced to via phone rather than in person. AT&T advised against using an informal "hello" as a way to begin a conversation. The suitability of having a servant place a call, and thus having a lag time between the time the call was answered and the caller picked up the line, was also a social concern. The social acceptability of extending an invitation by phone rather than by letter, messenger, or in person was questioned. Additionally, privacy, an issue prior to direct dialing, resulted in AT&T's creation of policies to restrict monitoring

and use of private conversations by operators (Taming Rude Technologies, 1994).

Despite the complexities and the inherent uncertainties related to technology, there are behaviors people know are rude and distracting or there are nonverbal indicators that certain behaviors are unacceptable in particular situations. Individuals complain about people who carry cell phones into restaurants, concerts, and other public areas without knowing how to turn off or silence them (Alsop, 2000). Phone companies sponsor ads in movie theaters asking the audience to please silence cell phones, and most libraries post rules against cell phone use. In fact, in some libraries a cell phone going off is grounds for being asked to leave the premises. These measures have proven to be insufficient. As a result technology is being developed to jam cell phones in specific locations. This technology is already in use in some countries and is set to be approved for use in select United States locations, such as prisons. Interestingly, a study in 1979 showed that individuals were more rude when a victim was invisible (Ahmed, 1979); however, in the case of cell phones, individuals are being rude to the individual who is visible to the benefit of the caller who is invisible.

Methodology

The purpose of this study was to identify how individuals perceive cell phone use and the resulting impact on their cell phone use. College students in a mix of lower division, upper division, and graduate level classes were surveyed at two southern universities.

The questionnaire focused on cell phone usage in four public locations: restrooms, libraries, movie theaters, and restaurants. Restrooms were selected because of the potential rudeness involved to the individual on the other end of the conversation. Libraries were chosen because historically they are a place of quiet study, reading or reference. Libraries also typically have rules in place for cell phones, which in theory, should limit cell phone use. Movie theaters were chosen because silence is typically encouraged and because screens lighting up have the potential to be distracting in a movie environment. Last, restaurants were selected because they are considered places of conversation typically with the individuals present at the table. An open-ended section was provided to allow respondents to write in three locations where it most bothered them when people took cell phone calls.

Participants were asked to respond to three categories of questions:

1) Whether an individual found the use of cell phones to be rude in a given location,
2) Whether an individual used a cell phone in a given location, and
3) Whether perception of rudeness differed if the call was a business call.

A five-point Likert scale ranging from Strongly Disagree to Strongly Agree was utilized.

Findings

The relationship between usage and rudeness was, in fact, the most surprising finding. It was originally expected that individuals would not use a cell phone in a location they considered to be rude. This expectation turned out to be completely inaccurate. Even in restrooms, where the differences between perceptions and actions were closest, the percentages differed by over 10 points. The greatest contrast was found in the case of libraries. Libraries had the second highest percentage of individuals who found cell phone usage rude. However, almost half of all individuals had taken a call while in a library. This finding was especially surprising because most libraries have rules against cell phones, a situation that is not true of the other locations although some higher end restaurants are starting to ban cell phone use (see Table 1).

Table 1: Results by Location

Location	Find it Rude	Taken a Call
Library	89.92%	49.48%
Movie Theater	96.73%	23.88%
Restaurant	30.59%	91.94%
Restroom	49.74%	60.87%

The results were analyzed to see if gender had any impact on the results. In general, men were more likely to find cell phone use rude and less likely to take a call, but the overall differences were slight (see Table 2).

Table 2: Results by Gender

Female

Location	Find it Rude	Taken a Call
Library	87.38%	51.91%
Movie Theater	97.04%	23.02%
Restaurant	20.88%	94.41%
Restroom	46.34%	62.12%

Male

Location	Find it Rude	Taken a Call
Library	91.56%	47.47%
Movie Theater	97.02%	25.00%
Restaurant	37.80%	90.24%
Restroom	52.38%	60.00%

Another point of curiosity was the impact of a business-related call on perception. In general, the expected impact on the results was observed. People found taking a call in a library less rude if it was business related, but more rude in the restroom (see Table 3).

Table 3: Business Calls

Business

Location	Find it Rude	Business Call
Library	89.92%	67.35%
Restroom	49.74%	67.33%

The open-ended comments also produced some very interesting findings. Locations where cell phone use most annoyed respondents included the following:

- Funerals,
- Weddings,
- Church,
- Check-out lines,
- Live theater,
- Class, and last but not least,
- Dates.

The survey results showed that even in locations where a significant majority of individuals believed taking calls to be rude, most answered their cell phones anyway. This behavior implies that individuals either consider their call to be an exception, possibly a onetime occurrence, or they simply do not care if it bothers the individuals around them. This discrepancy could be addressed through social pressure, but to create social pressure there needs to be a standard set of rules or social norms. To address the issue, the researchers suggest covering cell phone etiquette in school, much like email etiquette is covered. Introductory information systems classes and business communications classes would be perfect for just this sort of lesson.

The following activities are recommended:

- Discuss the effects of cell phone rudeness in terms of costs, such as business costs, financial costs, personal costs such as loss of respect for the individual taking/making the call, and the potential emotional costs to those around the caller.
- Present and discuss what constituted communication rudeness to previous generations.
- Discuss how generational differences can impact how the individual calling or being called might perceive the individual in the inappropriate location. For example, if a boss who is from a different generation calls an employee while the employee is at a movie, how is perception impacted?
- Engage students in role-playing.

- Conduct brainstorming sessions on how to combat the cell phone etiquette problem.
- Hold class discussions or present assignments requiring students to generate a set of rules for cell phone etiquette.

"Rudeness is on the rise because we're not realizing these behaviors are rude" (Puhn, 2005). Engaging students with class activities should raise the cognizance level of students and in turn result in decreased etiquette violations.

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ANALYSIS OF IMPROVEMENT IN STUDENT ACHIEVEMENT WHEN TEACHING EXCEL AND ACCESS USING SCREEN RECORDER SOFTWARE

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Introduction

Educational delivery methods have changed in recent years to include the use of online delivery systems, such as Blackboard and WebCT, which include active learning features. For effective online delivery, however, curriculum developers need to be very careful to avoid turning online courses into online correspondence courses. Online instructors have to offer more than reading assignments and testing.

The use of screen recorder software, such as Camtasia Studio (www.camtasia.com), is one method that is being used by faculty for content delivery to students through Blackboard and other online delivery systems. In order for the use of this type of software to be effective, however, the students have to be willing to take advantage of the active learning materials.

Statement of the Problem

The authors teach a sophomore level course which includes only instruction in MS Office Excel and Access. College of Business faculty have a certain level of expectation that the students will have strong Excel and Access skills upon completion of the course.

The authors are constantly looking for ways to continuously improve the level of student achievement in this course. Changes implemented in the past include: (1) removing instruction on Word and PowerPoint to provide expanded coverage of Excel and Access, and (2) using a wider variety of delivery methods by offering the course as a face-to-face, hybrid, and online only course each semester.

This study is the second phase of the attempt to continuously improve the MIS 2343 – Desktop Decision Support Technology course at the University of Central Arkansas in Conway. A paper entitled, "Comparison of Student Achievement When Teaching Excel and Access Using Different Types of Learning Environments" was presented at the 2008 ABIS meeting. The paper discussed findings from the first phase of the research.

During the Fall 2008 semester, the authors developed screen recorder video clips using Camtasia Studio that contained instruction on how to complete the assignments presented in the Excel and Access chapters in the textbook used in the course. The video clips were posted on WebCT and Blackboard, as both course management programs are used by the authors. The students were told to view the video clips as often as necessary to learn how to complete the tasks taught in the chapters.

Purpose of the Study

The purpose of this study was to analyze class results of the Fall 2008 MIS 2343 classes to determine improvement in student performance when offered instruction in Excel and Access through video clips developed using the Camtasia Studio, screen recording software program.

Methodology

Class data from multiple sections of the MIS 2343 – Desktop Decision Support Technology classes, an Excel/Access course offered in the College of Business at the University of Central Arkansas during Fall 08 was analyzed to determine the extent to

which the use of Camtasia Studio screen recorder software may improve student performance.

Primary data collected from the Fall 2008 final class results was analyzed. The data was compared to an average of class results from the previous semester (published in last year's study presented at the 2008 ABIS meeting) to determine improvement. Primary data was also collected from from a survey of the Fall 2008 classes to help determine the extent to which the students used the Camtasia Studio video clips as a learning tool.

Findings

The findings include an analysis of class results for students taking MIS 2343 – Desktop Decision Support Technology during the Fall 2008 semester. Anecdotal data provided by the instructors based on their experience during the semester and results of a survey of students is also discussed.

There are three different instructional delivery methods that are used each semester for this class including: 1) the traditional instructor-led classroom (face-to-face with required attendance for testing), 2) the hybrid classroom (optional student attendance based on their need for instruction with online testing), and 3) the online learning environment (no scheduled class meetings with online testing).

Anecdotal Comments and Results - Camtasia Tutorials Addition (Carla Barber)

Lea Anne Smith and I both created the Tutorials with Camtasia. We split the chapters for both Excel and Access between the two of us.

On the second day of class, I went over Blackboard information with the class. I pointed out all of the features that would be available for them to use…gradebook, assessments, assignments, and the tutorials. I demonstrated the 1st Excel Chapter Tutorial for them in class so they could see what it was like. I explained to them that since this class was being handled as a "hybrid" course, that I wanted to make the tutorials available to them in case they had trouble understanding the concepts of the chapter…or just what the chapter really wanted them to do. As part of the hybrid class, I told them that I would be in the classroom during our scheduled class time for any of those students that needed more detailed help.

Several times, when students would come in to the class for help, they were working on the assignments and needed help completing certain tasks. I would always ask the questions, "Did you work through the chapter?" and "Did you look at the tutorials for that chapter?" The answer was usually "No." So many of them seemed to assume that they could just skip the chapter material and go straight to the assignment and "figure out" what they needed to know by flipping through the chapter until they located something in the chapter that might tell them how to do it. My response was always, "Work through the chapter, or look at the tutorials, and then if you still don't understand, let me know!"

At the end of the semester, I sent out an email with 4 questions:

1. Did you use any of the chapter tutorials for Excel?
2. Did you use any of the chapter tutorials for Access?
3. Did you find the tutorials helpful? Please explain your answer in as much detail as possible.
4. What would you change, if anything, about the tutorials? (The voice of the instructors cannot be changed!) :-)

Out of 33 students, I received 19 (57.6%) responses…even though they were told to "Please read and respond!!"

Of the 19 respondents, for Excel, 3 (15.8%) said "yes", they had used the tutorials, 16 (84.2%) said "no". For Access, 2 (10.5%) respondents said "yes" to using the Access tutorials and 17 (89.5%) said "no". Three of the nineteen respondents stated that they had "forgotten" that there were any tutorials.

Below are some comments from survey Question #3 and #4 or just generalized comments:

- Q#3. At first I started doing all of the tutorials, but then I realized that I was just wasting time. I could go step by step through the projects and be just fine. There was one time, however, that I could not figure out what to do so I went to the tutorial which cleared up my confusion.

  Q#4. There is really nothing that I would change about the tutorials. The one that I really did use was very helpful.

- Well to be honest, I have a wireless card for my computer so they take forever to download. The times that I was stuck and needed something though, they were very helpful. I think that they were a great idea and were very beneficial to class.

- Q#3. Yes, the tutorials gave extra tips not included in the book. It is helpful because once I see something done, I can remember how to do it. I don't have excel or access at home so the tutorials were very helpful.

  Q#4. The only problem I had was one tutorial a loud buzzing noise drowned her out for about half of the tutorial. other than that everything was good.

- I honestly did not use the tutorials. I wish that I had. I didn't know there were any until I saw this e-mail that I didn't remember I had. I forgot to ever check this e-mail because I tried to forward these e-mails to my main e-mail address and it didn't work. Anyway, I am sure they would have been helpful and should probably continue for the benefit of the students.

- Honestly I did not use the tutorials at all. Not because I did not want to, I just forgot how to get to them. I was ok reading the step-by-step tutorials from the book and going from talking to you in class, and e-mails you sent me. I remember the sample tutorial we heard from the first day, and it seemed to be very straight-forward and lined out. I recommend something like that to new students to MIS I regret not using them now! But I was ok reading from the book.

- I'm sorry I didn't use the tutorials. I'm sure they would've been helpful had I used them.

- Yes it would definitely help the students who are completely unaware how Excel or Access works

- Q#3. No, because if you didn't know how to do it the tutorials didn't help

  Q#4. They are pretty good.

For those students who responded with a "yes" answer to either Question #1 or #2, implying that they had used the tutorials, their comments about the tutorials were very positive.

Since a very large percentage of my students did not indicate on the survey that they used the tutorials, any attempt to statistically prove that this semester's average grades were affected by using the tutorials would not be possible.

Anecdotal Comments and Results – Camtasia Tutorials Addition (Lea Anne Smith)

I feel that adding the Camtasia tutorials could have an enormous impact with all types of classes, if the students choose to use the tutorials. From the responses that were received, students who did take advantage of the tutorials found a great benefit to their learning response and abilities.

Like any other class if point values were assigned to the usage of the tutorials then they would probably have been more fully

utilized. I, however, put the tutorials out for the students to find and utilize for their own benefit, without offering point values to be attached. In turn, some responses that I received to my questionnaire was that they did not have time for the tutorials, or did not have time to fully explore all that the online content of the class had to offer. If students are not willing to be active participants in their own learning process, should instructors keep putting forth the extra effort to help them do so?

Response numbers and student comments from the survey of my classes were very similar to Carla's class, with one exception. One of the students replied, "What tutorials?"

As a result of the Camtasia tutorials, I did not notice a marked increase in the grades of my students, nor did I notice a marked decrease in the need for clarification of items that were covered in the tutorials. Since a very large percentage of my students did not indicate on the survey that they used the tutorials, any attempt to statistically prove that this semester's average grades were affected by using the tutorials would not be possible.

Summary and Conclusions

The addition of Camtasia Studio tutorial files for use by students in the MIS 2343 – Desktop Decision Support Technology class did not provide the expected results. The fault did not lie with the creation and posting of the tutorials. Instead, a lack of initiative on the part of the students seemed to be the issue.

It appears that the authors can conclude that without further incentives to encourage students to use the tutorials, just making the tutorials available to students is not adequate.

Recommendations

In order for the addition of tutorial files recorded using Camtasia Studio software to be a method of improving student success in the MIS 2343 – Desktop Decision Support Technology class, the students have to be motivated use them. Recommendations for getting the students motivated include:

- Frequently reminding students that the tutorials are available.
- Offering bonus points for reviewing the tutorials.

A CORRELATION STUDY: THE EFFECT OF ONLINE QUALITY ON STUDENT LEARNING OUTCOMES AND ATTRITION

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Abstract

The growing demand for online courses from working adults and the global competition from virtual universities has caught the attention of higher education administrators, requiring them to modify traditional methods of educational delivery in order to sustain long-term competitiveness. The University of Central Oklahoma is one of many traditional brick and mortar universities currently undergoing organizational change and making the transition to a hybrid university, offering both ground-based and online courses. As online course quality assurance is an innovative initiative at the University of Central Oklahoma, standardized rubrics and processes were developed for course evaluation and certification. To enhance organizational learning and encourage a supportive culture for quality online education, a study was conducted to examine the relationships between (a) online course quality and online student attrition and (b) online course quality and online student learning outcomes. The sampling frame included online courses that were voluntarily submitted by faculty during the fall 2007 semester. Secondary data were provided by institutional administrators. Pearson correlation and regression analysis were conducted to answer the research questions and hypotheses. The study highlights the importance of quality online courses by providing administrators with insights about the necessary resources and technical support required by faculty and students to enhance teaching and learning effectiveness in virtual classrooms. In order to sustain long-term competitiveness in the 21st century e-learning environment, future research that extends this study becomes important as more traditional brick and mortar universities make the transition to hybrid institutions.

Introduction

Advanced technology enhances education delivery and knowledge acquisition in the form of e-learning where learners and faculty members are at a distance from one another but are connected by technological media such as the Internet and a course management system like WebCT/Blackboard (Saba, 2005). Online courses offer higher education institutions innovative ways to target adult learners wanting to continue their education but are constrained by work schedule, family and/or time (Coppola, Hiltz, & Roxanne, 2002; Lessen & Sorensen, 2006). In recent years, the demand for online courses has risen because online courses allow adult learners to engage in just-in-time skill acquisition both flexibly and globally without time and location constraints (Zhang, 2004). In 2005, over 500,000 online courses were offered (Carr-Chellman, 2006). The number of students enrolled in online courses has more than doubled in the past five years, from "483,113 in 2002 to 1,501,005 in 2006" (Romano, 2006, A06). The growing demand for online courses has caught the attention of traditional brick-and-mortar higher education administrators wanting to satisfy adult learner needs in knowledge-based global societies (Chen, Gupta, & Hoshower, 2006). The University of Central Oklahoma is one of many traditional higher education institutions currently undergoing organizational change to offer online education and make the transition from traditional to hybrid institution. As online course quality assurance is an innovative

initiative at this university, a committee of 15 inter-disciplinary faculty members developed university-wide rubrics that serve as guidelines for online course evaluation and certification.

Statements of Problem and Purpose, Research Questions and Hypotheses

Although many faculty are supportive of e-learning, some faculty believe technology cannot improve teaching and learning. In addition, they believe online courses are inferior to ground classes in terms of quality and learning outcomes (Anstine & Skidmore, 2005; Woodell & Garofoli, 2003). Research also shows that one problem with online courses is that they undermine course content, quality and design, affecting student learning outcomes and course completion (Alexander, 2002). In a survey of 4,100 learners, Corporate University Xchange found that the dropout rate for online courses (hereafter referred to as attrition) is 85 percent versus 15 percent for the traditional face-to-face classroom (Alexander, 2002, p. 15).

While previous research examined institution, technology and student motivation factors and their contribution to student learning outcomes, the relationship between online student attrition and online course quality remains under explored (Alexander, 2002; Anstine & Skidmore, 2005; Carr, 2000; Schilke, 2001; Woodell & Garofoli, 2003). To bridge the gap in literature, the purpose of this study was to examine the relationships between (a) online course quality and online student attrition, and (b) online course quality and online student learning outcomes. This study sought to answer the following research questions (RQ):

RQ#1 - What is the relationship between online course quality and online student learning outcomes?

RQ2: What is the relationship between online course quality and online student attrition?

The research hypotheses for this study are two-tailed hypotheses. The researchers make a bi-directional prediction that online student learning outcomes and course completion rates can be positively or negatively related to online course quality based on past studies (Alexander, 2002; Anstine & Skidmore, 2005; Carr, 2000; Schilke, 2001; Woodell & Garofoli, 2003).

H_a1: There is a relationship between online course quality and online student learning outcomes.

H_a2: There is a relationship between online course quality and online student attrition.

Literature Review

This section presents an overview of the scholarly contribution that provides the theoretical framework for the research questions and hypotheses. Discussions for the research variables include online course attrition, online student learning outcomes and factors that contribute to the quality of online course design.

Online Attrition

National online higher education course attrition rate statistics are currently not available (Carr, 2000). However, self-reported data from higher education institutions does indicate a lower completion rate for distance education courses. In a survey of 4,100 learners, Corporate University Xchange found that "85 percent dropped out of online courses versus 15 percent dropped out of traditional face-to-face classrooms in 2001" (Alexander, 2002, p. 15). In a similar study, one higher education institution reported a "58 percent completion rate in distance education courses versus a 71 percent completion rate in the same courses offered in a traditional classroom setting" (Carr, 2000, p. A40).

Several factors may contribute to online course attrition. In one study, course satisfaction, course activities and

perceptions regarding the content of the instructional material were found to be predictors for course completion (Siqueria de Freitas & Lynch, 1986). In another study, technology inclusion was found to be a barrier to online course completion (Schilke, 2001).

Online Student Learning Outcomes

By combining strong brand recognition with flexible online course offerings, prestigious universities, such as Columbia, Stanford and Cambridge, capitalized on their intellectual capital, by adopting a spin-off model (Huynh, Umesh, & Valacich, 2003). However, many well-known universities showed mixed results for their online course implementation. Columbia University closed its online subsidiary, Fathom, after investing $25 million in the venture (Carlson, 2003).

While some faculty members believe that technology can improve teaching and learning, other faculty members are skeptical about the quality of online courses and learning outcomes (Woodell & Garofoli, 2003). A study of 88 MBA students at a regional university found that student learning outcomes from online courses were inferior to those of traditional courses (Anstine & Skidmore, 2005). In contrast, the University of Maryland University College (UMUC) successfully created a spin-off model, providing online education for 80,000 students worldwide (University of Maryland, n.d.). Furthermore, Neuhauser asserts the "quality of online learning is as effective as F2F learning" (Neuhauser, 2002, p. 112). A meta-analysis of 96 studies by the Department of Defense's Advanced Distributed Learning Initiative and the University of Tulsa found learning effectiveness of web-based courses comparable to that of classroom instruction (Sitzmann, Wisher, Kraiger, & Stewart, 2005).

Quality Online Course Design

Several factors should be considered when formulating design strategies to enhance student learning effectiveness for web-based courses. These factors include, but are not limited to, pedagogical transition, adult learning theory, cognitive learning theory, theory of constructivism, social learning theory, Bloom's taxonomy and technological considerations.

Pedagogical transition. Teaching in the virtual environment requires different pedagogical strategies than those used in the traditional face-to-face classroom (McKnight, 2004). Despite the fact that online coursework "has gained momentum and now accounts for a significant proportion of course offerings in higher education," limited pedagogical guidance is available to faculty members (McKnight, 2004, p. 510). Many faculty members undergo the trial-and-error process by unlearning past teaching habits and philosophies for their online courses. Several popular pedagogical theories for e-teaching faculty members include adult learning theory, cognitive social learning, constructivism, social learning and Bloom's taxonomy of Intellectual Behaviors (Tangdhanakanond, Pitiyanuwat, & Archwamety, 2006; Waterhouse, 2005, p. 30).

Adult learning theory. The concept of an adult learner was brought to the education forefront in 1968 by Malcolm Knowles, a major philosopher of adult education in the United States (Knowles, 1973). Knowles promoted andragogy, which is defined as the "art and science of helping adults learn." Andragogy is an integral adult learning theory concept (Knowles, 1980, p. 38). Knowles (1980) asserts several assumptions about adult learning, including adult learning is (a) task-centered and problem-centered; (b) active and self-directed; and (c) life-long and developmental.

Online faculty members should understand that adults prefer to be actively engaged and involved in the learning process and become ready to learn what they need to know in order to cope effectively with their real-life situations (Knowles, 1980). Learning objective alignment with adult student needs, interests, skills,

attitudes, readiness and preferences can enhance learning effectiveness (Cheren, 2002; Mungania & Hatcher, 2004). Administrators can develop instructional design training to enhance faculty member abilities for designing learner-centered courses for student engagement and increased online learning effectiveness (Baker, Botts, & Owen, 2004; Trotter, 2006).

Cognitive learning theory. The focus of cognitive learning theory is for faculty members to develop activities that help students learn how to learn (Bellefeuille, 2006). Cognitive learning theory underlines the importance of goal setting and the type of feedback that is given to learners to motivate learning. Faculty members should also develop learning activities that require students to engage in self-regulatory strategies such as logging on their online courses daily to participate in threaded discussions. For example, the University of Phoenix requires online students to post five times a week to retain active status in the online courses in which they are currently enrolled. Whipp and Chiarelli (2004) found that successful learners in a Web-based course used self-regulatory strategies.

Theory of constructivism. Constructivism encourages faculty members to cultivate a learning environment by infusing students with a desire to engage in self-directed, self-reflective, interactive, collaborative learning experiences (Bellefeuille, 2006). Self-paced and autonomous learning, which are key principles of constructivism, are enhanced in a virtual learning environment where students can engage in learning anytime, anywhere, and at their own pace (Bellefeuille, 2006).

Social learning theory. The focus of social learning theory is for faculty members to promote scaffolding through technology. Scaffolding is a key idea that derives from Vygotsky's (1978) social learning model. Faculty members can incorporate technology to elevate a student's cognitive level with modeling, support and fading (Bellefeuille, 2006). Modeling provides students with adequate learning structures, leading students to the desired learning behavior. Supporting provides students with feedback so that students can independently perform tasks or assignments. Fading reduces the amount of support over time so that students can become confident and self-reliant (Bellefeuille, 2006).

Bloom's taxonomy. The focus of Bloom's taxonomy is for e-teaching faculty members to classify and address different levels of intellectual behaviors that are important in the learning process, including cognitive, affective and psychomotor domains (Waterhouse, 2005, p. 33). The premise of Bloom's taxonomy is that mastery of a concept is defined by the ability to exhibit six increasingly sophisticated levels of cognitive behavior relative to the concept including:

(a) knowledge – ability to recall learned material
(b) comprehensive – ability to explain and restate ideas
(c) application – ability to use learned material in new situations
(d) analysis – ability to categorize, distinguish, compare or contrast material
(e) synthesis – ability to design, formulate, plan and devise material
(f) ability to judge the worth of material against stated criteria

Incorporation of Bloom's taxonomy in an e-teaching pedagogy enhances the faculty member's ability to foster critical thinking in a student-centered learning environment where students "become more actively engage in the learning process" (Waterhouse, 2005, p. 37). Regardless of which pedagogical theories are incorporated into online courses, faculty members will experience a paradigm shift from teacher centered to student centered (Wingard, 2004). E-teaching faculty members reposition themselves as facilitators whose collaborative presence invites "peer interaction and participation among learners" in a virtual learning environment (Conrad, 2002, p. 212). The faculty member's teaching philosophy changes from

knowledge transmission to knowledge construction (Yu, Wang, & Che, 2005). In addition, e-teaching faculty members foster a supportive collegial, collaborative and interactive learning environment to enhance the sense of community by providing students with material and technology resources (De Simone, 2006).

Technological implementations and considerations. While incorporation of leading edge technology is critical, appropriate instructional design is even more significant as technology is a tool for achieving the objective of helping students learn more effectively in a virtual learning environment (Behrens, Mislevy, Bauer, Williamson, & Levy, 2004; Zemsky & Massey, 2004). When considering technological appropriateness, scalability is one important factor to consider in terms of a student's connection speed and digestibility (Piskurich, 2006). If students have low-end modem connections, lectures overloaded with many graphic objects can be burdensome and time-consuming in terms of downloading and accessing the files. Streamlining the learning content is more significant than using fancy graphics (Behrens et al., 2004; Zemsky & Massey, 2004).

The second consideration is digestibility. More faculty members stop creating lengthy learning and pare down the size to a digestible learning object. A learning object is a reusable unit of instruction (Singh & Bernard, 2004). A learning object provides expandability as building blocks that can be linked together and used in different e-learning contexts (Zemsky & Massey, 2004). For example, a management information system (MIS) online instructor can create a learning object that presents steps to submit one assignment to a course management system, such as WebCT, and can also be used for other assignments.

The third consideration is reusability. The Sharable Content Object Reference Model (SCORM) is an example of a learning object. SCORM is a collection of specifications and standards that enable e-teaching faculty members to apply the principles of interoperability, accessibility and reusability of online learning content (Singh & Bernard, 2004). For example, an online MIS instructor can combine different learning objects from Microsoft Access database design, Microsoft VB.NET programming and WebCT assignment submission to create a powerful web-based business architecture (Carmean & Haefner, 2002).

The fourth consideration is to align e-teaching styles with student learning styles. The adoption of sound design strategies should address different student learning styles. One common online course design model is the process of analysis, design, development, implementation and evaluation (ADDIE) that faculty members can incorporate into their e-teaching course design (Yu, Wang, & Che, 2005). ADDIE helps faculty members align student learning styles with course design. According to the multimedia learning theory, addressing learners with audio and visual learning styles, faculty members can use hypermedia technology to develop learning modules and content with components of sounds, videos, image, diagrams and graphics (Yu, Wang, & Che, 2005; Waterhouse, 2005). For learners with a kinesthetic learning style, learning modules with high interactivity can enhance student participation by working on project-based assignments to enhance learning (Zhang, 2004). A Chinese proverb "Tell me and I'll forget; show me and I may remember; involve me and I'll understand" best summarizes the three learning styles discussed above.

The fifth consideration is feedback mechanism. There is no single design formula that fits all institutional missions, faculty member teaching styles and student learning needs. The triadic relationships among institution, faculty and students require constant adjustment and fine-tuning to achieve optimal online learning outcomes. Hence, open dialogs, communication and course evaluation as part of the online course design are critical success factors. Feedback that uses these mechanisms can be

implemented and calibrated to enhance the quality of online course design (McKnight, 2004).

The sixth consideration is globalism. The adoption of design strategies addressing global settings in terms of languages, time zones and cultural differences is vital if online courses are offered internationally (Behrens et al., 2004; McNaught, 2003). Cisco introduced the assessment and deployment contexts of the Networking Performance Skill System (NetPass) to address the global network issues relevant to e-teaching design. Between 1998 and 2004, over 10,000 schools in more than 150 countries joined the NetPass program (Behrens et al., 2004).

Methodology

The study's research design is a quantitative, correlation research design. The time dimension of the research is cross sectional and the study was conducted during the spring 2008 semester. This research project examined the relationship between (a) online course quality and online student attrition and (b) the relationship between online course quality and learning outcomes, thus creating a triple-learning process that enhanced administrator ability to align with stakeholders, including students, faculty and other administrators.

The population included online courses that were offered at the University of Central Oklahoma for the fall 2007 semester. The sampling frame included online courses that were submitted by faculty voluntarily for evaluation and certification. Pearson correlation and regression analysis were performed to test the significance for the research hypotheses and research questions.

Data Compilation and Analysis

The purpose of this quantitative study was to examine the relationships between online course quality and student learning outcomes and attrition. The University of Central Oklahoma's administration has primary data ownership. The Center for Professional Distance Education (CPDE) owns data about online course quality. An Online Course Evaluation Committee (OCEC) is comprised of 15 interdisciplinary faculty members from 5 colleges. The OCEC has developed a rubric to facilitate the evaluation process. OCEC members evaluate and assign scores for online courses that are submitted by online faculty. The Admissions Office owns data about online student attrition and student grade point average (GPA). The researchers collaborated with administrators to compile quantitative data. The researchers imported secondary data into the Statistical Package for the Social Sciences (SPSS) and Microsoft Excel 2007. To answer the research questions and hypotheses, the researchers conducted statistical data analyses.

Analysis for Research Hypotheses

To answer the first research hypothesis: There is a relationship between online course quality and online student learning outcomes, the Pearson correlation was conducted in Microsoft Excel 2007 to test the statistical significance at the 95 percent confidence level. The probability (p-value = .001) was compared to the level of significance at 5 percent. The test evidenced statistical significance ($p < .05$) and the null hypothesis was rejected.

To answer the second research hypothesis: There is a relationship between online course quality and online student attrition, the Pearson correlation was conducted in Microsoft Excel 2007 to test the statistical significance at the 95 percent confidence level. The probability (p-value = .001) was compared to the level of significance at 5 percent. The test evidenced a statistical significance ($p < .05$) and the null hypothesis was rejected.

Analysis for Research Questions

To answer the first research question, What is the relationship between online

course quality and online student learning outcomes?, online course quality scores and student learning outcome scores (weighted grade point average) for selected online courses were used to compute the Pearson correlation coefficient (r) in Microsoft Excel 2007. Statistical procedures were conducted, and the data analysis evidenced a positive relationship between the quality of online courses and student learning outcomes.

To answer the second research question, What is the relationship between online course quality and online student attrition?, online course quality scores and withdrawal rates for selected online courses were used to compute the Pearson correlation coefficient (r) in Microsoft Excel 2007. The attrition rate, which was a numeric weighted average for each course, was determined by dividing the total withdrawals by the total number of online students enrolled in selected sections of the fall 2007 online courses. Statistical procedures were conducted, and the data analysis evidenced a positive relationship between the quality of the online courses and student attrition.

Additional Findings

When reviewing the compilation and analysis of the secondary data, other findings that were not sought by the research questions were noted. As the University of Central Oklahoma administrators do not mandate that faculty members must submit new or revised online courses for quality assurance, only 21 of 111 online courses were submitted for evaluation and certification during the fall 2007 semester. Among non-certified online courses, two observations were noted. First, attrition rates for these non-certified online courses ranged from 2 percent to 100 percent in comparison to 4 percent to 27 percent. Second, enrollments for non-certified online courses were small. For example, 11 of the non-certified online courses had less than 5 students; whereas the averaged enrollments for certified online courses was 21.

Implication of Findings

While the study provides a unique finding of a positive relationship between student and quality of online courses, some plausible explanations, which are based on past research and current feedback, may provide further insight. Garland (1993) suggested that the reasons for students withdrawing from online courses can be placed into situational, dispositional, institutional and epistemological categories. Situational attrition arises from a student's particular life circumstances, such as a change in employment, marriage or illness. Dispositional attrition results from personal problems that impact on the student's persistence behavior such as learning styles and motivation. Epistemological attrition occurs as the result of impediments that are caused by disciplinary content or perceived difficulty of the content. Institutional attrition is caused by the student's experience with the institution. For example, students who withdrew from the fall 2007 semester online courses might have experienced technological obstacles that existed in the virtual learning environment. At the University of Central Oklahoma, WebCT is used as the e-campus platform. However, no formal WebCT training classes are offered to online students. Furthermore, technical support is only available for students and faculty Monday through Friday 8 a.m. to 5 p.m. Unfortunately, most working adult learners need technical support in the evening and weekends when they attend virtual classes. Furthermore, there is no technology policy that provides students and faculty with required hardware specifications, network configuration and software installation guidelines. The incompatibility of PCs and laptops can hinder e-teaching and e-learning effectiveness.

Moreover, students who enroll in online courses might not have the necessary skills to manage their time and tasks. At the University of Central Oklahoma, no formal time management training is offered to faculty and students. Lack of timely

feedback, interaction and guidance from online instructors can further hinder an online student's ability to complete and submit assignments on time.

Recommendations

Faculty members and students who are motivated, prepared and supported are more likely to succeed in the virtual classroom (Eynon 2005; Folkers, 2005; Kidney, 2004; Mallard & Atkins, 2004; Weidman, 2002). The following suggestions are outlined for administrators to consider when addressing online attrition that might be caused by institutional factors. First, research shows that teaching online courses requires faculty members to incorporate technology and strategic pedagogy into online course design so that students can function in a more student-centered learning environment (Aduwa-Ogiegbaen & Isah, 2005; Kidney, 2004). Faculty members can benefit by enrolling in online courses to gain insights on what online students would experience before teaching online courses (Waterhouse, 2005).

Next, training faculty and students with WebCT and time management skills is critical for teaching and learning effectiveness (Hogan & McKnigh, 2007). Furthermore, providing faculty members and students with technical support that extends to 24 hours 7 days a week can prevent faculty and students from experiencing a degree of depersonalization and a low degree of personal accomplishment (Abramsons, 2003; Hogan & McKnigh, 2007).

Moreover, assisting faculty to move away from developing heavy text-based lectures and developing technical skills to incorporate multimedia (ie: video, podcasting, etc.) into course design and learning modules so that the student's audio, visual and kinesthetic learning styles can be better addressed is important. (Evans, 2001; Hislop & Ellis 2004; Mossavar-Rahmani & Larson-Daugherty, 2007; Zhang, 2004; Waterhouse, 2005).

Significance to Leadership

Traditional universities are likely to encounter intensive competition from virtual universities, as advanced technology and emerging e-learning models allow virtual universities to deliver online education and degrees to working adults without geographic constraints (Folkers, 2005; Twigg, 2002). To sustain long-term competitiveness, traditional universities must extend geographic service areas by becoming hybrid institutions that offer both traditional and online courses to attract more working adult learners (Ali et al., 2005; Drucker, 2000; Ryan et al., 2005; Waterhouse, 2005). However, institutional administrators and faculty have the tremendous responsibility to ensure that the quality of online education is pedagogically addressed when moving from traditional to virtual classrooms. As online course offerings and online quality assurance are new initiatives for traditional brick and mortar universities, knowledge gained from this study can provide a triad learning process through the assessment and feedback mechanism from stakeholders including students, faculty, and administrators (Welkener, 2004). Furthermore, the findings provide administrators with insights into quality online education implementation and calibration when transitioning to hybrid institutions.

Limitations and Future Study

This quantitative correlation study has several limitations. First, the study's sampling frame was too small to generalize the study to a larger population (Leedy & Ormrod, 2001). Requiring faculty members to submit their online courses for evaluation prior to teaching their online courses may result in a larger sample size.

Second, this study compared the relationships between (a) online course quality and online student learning outcomes and (b) online course quality and online student attrition based on secondary data

that were summarized in an aggregated form for one semester. A longitudinal study that examines the data relationships at different levels is recommended.

Third, this study's variables of interest explored for relationships included online course quality, online student learning outcomes and attrition. However, other factors that may also affect learning outcomes and attrition, but are not under investigation, include students, faculty, technology and institution. Student factors include, but are not limit to, motivation, self-efficacy, technical expertise, study habits, learning styles, study time and critical thinking skills. Faculty factors include, but are not limited to, pedagogy, course design, responsiveness and emotional intelligence (ie: keen sense of understanding student frustration). Technological factors include software, network, infrastructure and course management systems, such as WebCT. Institutional factors include faculty training, technical support and administrative policies affecting the faculty member's ability to teach effectively. Future studies should explore factors affecting online teaching effectiveness and learning outcomes.

Further investigations are needed to explore the institutional challenge to continue with quality online courses and reduce online attrition. This knowledge becomes increasingly more important as more traditional higher education institutions undergo organizational change to become hybrid institutions in order to sustain long-term competitiveness in the 21st century global e-learning environment.

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Notes

COMMUNICATING WITH POWERPOINT THE RIGHT WAY!

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Abstract

Almost every presentation made in the classroom or at conferences is delivered using some version of Microsoft's PowerPoint software. Unfortunately, most presentations are delivered using poor communication skills. Over the past 20 years the authors have developed and refined 10 rules for effective communication using a presentation software package. The top three rules are (1) Don't put too much information on one slide, (2) Bring in text one line at a time and (3) Use short incomplete sentences.

Introduction

"Several members of the congregation approached the pastor of their local church questioning why he had preached the same sermon four Sundays in a row. The pastor replied that when they started following that sermon he would move on to another."

No other application software package has grown in popularity as has Microsoft's PowerPoint presentation software.

The authors have presented research and attended presentations at many different conferences over the past few years. Most of the other presenters at these conferences (including Association of Business Information Systems) violate almost all of the 10 rules and are in need of some helpful hints on using PowerPoint the right way!

Just about every presenter at conferences now uses PowerPoint in their presentation, i.e. it's a very popular package. Lehr (2004) stated "30 million presentations a day or 1.25 million every hour" are given.

Two hundred and twenty-three people from education and workforce training areas were asked to provide the tools that they used to in their own learning and to create materials for others. In 2008, PowerPoint was ranked in the TOP 10 as number 8. (Centre for Learning and Performance Technologies, 2008)

The Rules

The authors have developed the following 10 rules over the past 20 years of using presentation packages both in the classroom and in their presentations of research at a variety of conferences. The software has progressed from the first DOS package – Harvard Graphics to the latest version of Microsoft's PowerPoint 2007. By following the rules below, presenters can be assured that at least the visual part of their presentation will "communicate" to the audience well.

Rule #1 – Don't Put Too Much Information on One Slide

Nothing beats eye to eye contact in an oral presentation. When a PowerPoint slide has too much text, graphics, pictures, etc. the audience will be focused on the slide and not the presenter. It is a simple exercise to move some of the information to the next slide. Just put the word "Continued" in the heading of the next slide.

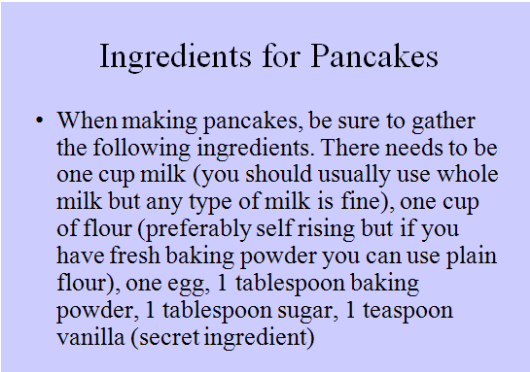
Rule #2 – When Using Lists on a Slide, Use Motion/Animation (i.e. Bring each line in one at a time)

We are an impatient society – constantly on the move. Bringing in items, especially text, makes a slide more viewable and more importantly it gives the speaker control over what the audiences sees and "hears." It also keeps the audience from reading ahead, thus allowing the speaker to maintain the audience's attention.

Rule #3 – Generally Use Short/Incomplete Statements

This rule is derived from rule #1. PowerPoint is the modern note card for the speaker and the audience. Statements should be just long enough to present the topic for discussion. The speaker fills in the details orally, keeping eye contact with the audience. Short sentences allow the audience to read the topic quickly and return attention to speaker. (See Slide 1 below.)

Slide 1 – Example of Violation of Rule #3



Rule #4 – Have Title of Show and Presenter on First Slides

It's just a good idea to let the audience know what the presentation is about and "who's" giving it. Discussing the title of the presentation and a little personal information often gives the speaker that few precious seconds to calm down and get into a comfortable speaking mode as well as making a connection with the listeners.

Rule #5 – Use Clip Art and/or Pictures When it Adds to the Show

As the availability of multimedia options continue to grow, the PowerPoint user may be tempted to "over-do" the clip art and/or pictures on the slides. Clip art and pictures can certainly make a dull show exciting (especially with some of the new animated clips). The danger is when the audience is watching the "show" instead of the speaker.

Rule #6 – Spell Check All Shows

Misspelled words can undo all the goodwill the speaker has established with the audience. One wrong word to an audience of 100 people will have 100 people thinking about the speaker's intelligence. Be sure to go to the Tools/Option window and have PowerPoint spell check words in all caps!

Rule #7 – Keep Text Off of the Bottom 1/3 of the Slide

This is a new addition to the 10 rules. Its purpose is to insure that those audience members in the back of the room/group can see the all of the information on the slide without much effort.

Rule #8 – Be Careful with the Background Design/Color

PowerPoint allows pictures, company logos and/or fancy designs to be backgrounds for slides. These usually add to the attractiveness of the entire show and should be used when appropriate. However special attention should be given to the font colors chosen to display the text information on these slides. Background colors and font colors should be different enough for the audience to easily "see" the text.

Rule #9 – Don't Read the Text to the Audience

Another new addition to the rules included after the authors attended several conferences – especially one in Salzburg, Austria. It was very difficult to sit through presentations with paragraph after paragraph of text (violations of rule #1 & #3) being read to us by the "learned" presenter. Presenters need to talk to the audience and not to the slide or a piece of paper!

Rule #10 – Always Have a Concluding Slide

It's just good presentation sense to have some closure to the show other than the "black" slide (which should be turned off anyway). The presenter can use something as simple as THE END or ANY QUESTIONS?, company logo or contact information. The audience will know then its okay to relax and perhaps ask questions.

Here are three situations when not to even use PowerPoint (Workplace Life, 2007):

1. When you make less than five slides.
2. For very frequent meetings
3. When another medium works better.

The authors "really like" PowerPoint but do recommend not using it just for the sake of using it.

We are confident that now YOU will be able to "communicate" with PowerPoint the right way!

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Notes

VIDEO TECHNOLOGY IN COMPUTER APPLICATIONS

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Purpose

To discuss current video technology and student feedback in CIS 1800 offered at Northwestern State University.

Introduction

The author wrote and developed CIS 1800 – Microcomputer Applications I, Introduction to Technology in 1986 and has taught the class since that year. By the fall 2006 semester, the author was struggling with the disparity of learning/teaching in CIS 1800 of the face-to-face sections verses the sections offered via the Internet. What methods could be developed to help maintain the integrity of the Internet course and provide a quality learning experience to the Internet students? In March of 2007, the College of Business was able to purchase 20 licenses for the multimedia/screen capture software, Camtasia Studio 4. With the availability of this software, the author began developing videos for the CIS 1800 Internet course he was teaching. The first videos were of Word, Excel and PowerPoint from Office 2003. In August of that same year the College of Business started using Office 2007 in all computer application courses, so all of the videos had to be done over. While it was a lot of work, in the end it made for better videos.

Implementation

For the fall 2007 semester, 21 videos were available for the CIS 1800 students taking the course via the Internet and Blackboard to view. These videos were developed using Camtasia Studio 4 produced by the TechSmith Corporation. All videos were created in the author's office on his Dell Optiplex 755 computer with a microphone and speakers. The training videos were made demonstrating various topics and skills in Microsoft's Office 2007 Suite, in particular – Word, Excel and PowerPoint. The 21 videos the author created are listed below:

Word
Default Fonts, Ruler and Tabs
Default Line Spacing
Printing Hints
Modified Block Letter of Application
Resume Information
Leftbound Report
Block Style Letter
Tables (2)
Newsletter (2)
Flyer

Excel
Estimated income demo
Estimated Income with Charts
Linking and Special Formulas
Payroll
If Statement Demo
Absolute Referencing

PowerPoint
Introduction to PowerPoint
10 Rules of PowerPoint
Multimedia

As stated each of these videos were developed using Camtasia Studio 4. When completed, each video had the file extension of .avi. Most of the videos were 2-5 minutes in length and took up 2-5 mb of memory. For viewing purposes, 5 minutes is the recommended length and for email purposes, 5 mb is manageable. These videos worked on about two thirds of the student's computers. The other one third of the students were initially unable to view the actual demonstrations in Windows Media Viewer – regardless of the version, i.e. They could hear the sound but no video could be

viewed. Several codecs were sent to each student, which in most cases didn't work either. To allow the students viewing access, the author uploaded the videos to You Tube (see Screen Shot 1) and supplied the students the related links to open the video. While the videos aren't as "clear" in You Tube as they are when viewed with Windows Media Player, they will play on almost 100% of computers.

Later in the semester a patch was available from TechSmith which allowed almost all of the students (including the authors home computer which would not play the videos properly) to view the videos with both picture and sound!

The students were not required but highly encouraged to view each of the videos provided "before" attempting the corresponding assignments located in various Modules in Blackboard. For the fall 2007, Word 2007 training and assignments were located in Module 1 (see Screen Shot 2). Each of the videos listed in Table 1 were available in this module. As the students completed the module, they were asked to give their opinions for each of the Word videos (bonus points were offered). Table 1 reports their responses. Almost all of the videos were rated as either "Very Helpful" or "Average Helpful". Only five of the videos had a "Not Helpful" rating and it was only one student per video that expressed that opinion.

The Excel portion of the class (Module 3 – see Screen Shot 2) continued with videos available for the supplemental assignments, i.e. those assignments not supported by the required textbook. With Excel being the most difficult of the three software packages, these videos were very instrumental in helping the students earn higher than usual grades for this module. Due to a technical problem, the author was unable to collect the student's opinions on the Excel videos.

Adjustments for Spring 2009

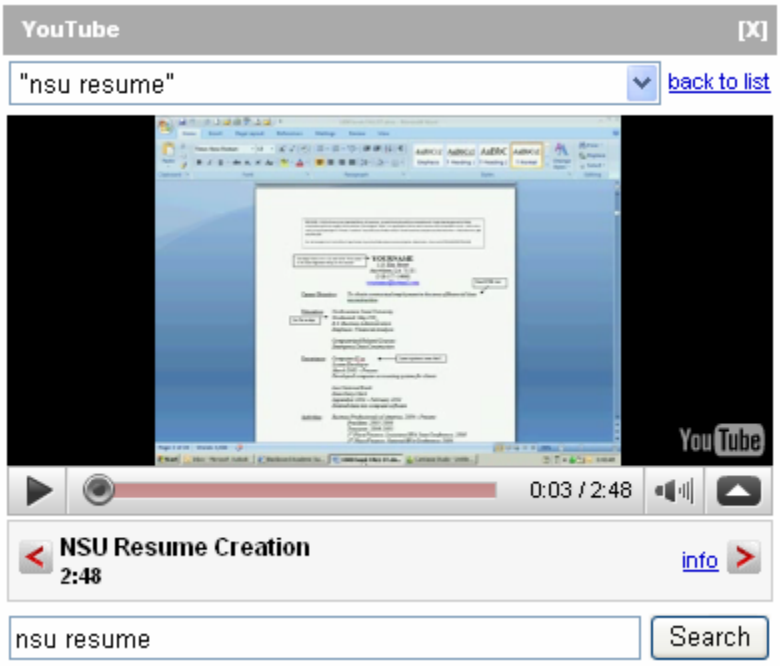
For the spring 2009 semester, the training videos will be required viewing. The author will track the videos through the Statistics Tracking function of Blackboard (see Screen Shot 3). It is believed that the grades students earn will be even better in this semester.

In October, 2007 Camtasia Studio 4 was upgraded to Studio 5. The functions are the same (See Screen Shot 4) but videos can be produced with .wmv extension easily. New videos on merging in Word seem to run longer in version 5 than with version 4. Any instructor looking to enhance their computer applications course should investigate developing videos for their students.

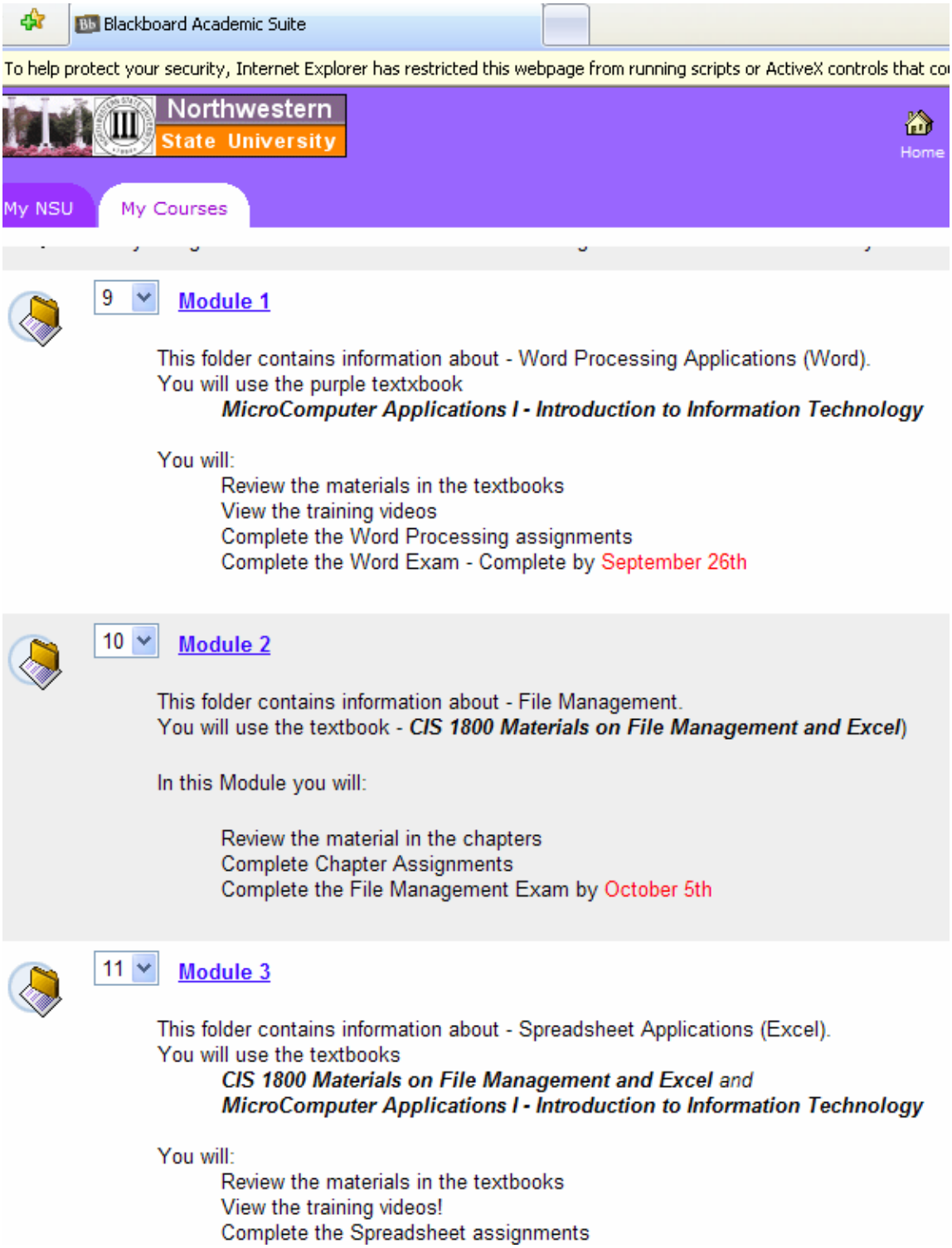
Table 1: Video Evaluations for CIS 1800

Video	Very Helpful	Average Helpful	Not Helpful	Viewed in You Tube	Did Not View
Default Ruler & Tabs	9	3		3	6
Default line spacing	9	3		3	5
Printing Hints	6	5	1		7
Mod block letter	12	4		4	1
Resume info	13	2	1	1	2
Leftbound report info	12	6		3	1
Block style letter info	12	4		2	2
Table info	11	6	1	2	3
Tables no lines info	9	6		2	5
Birthday flyer	10	3	1	1	5
Newsletter Part 1	10	2		2	2
Newsletter Part 2	10	2		2	3
CIS 1800 Introduction test video	11	3	1	1	4
Microsoft Word presentation	11	4			3

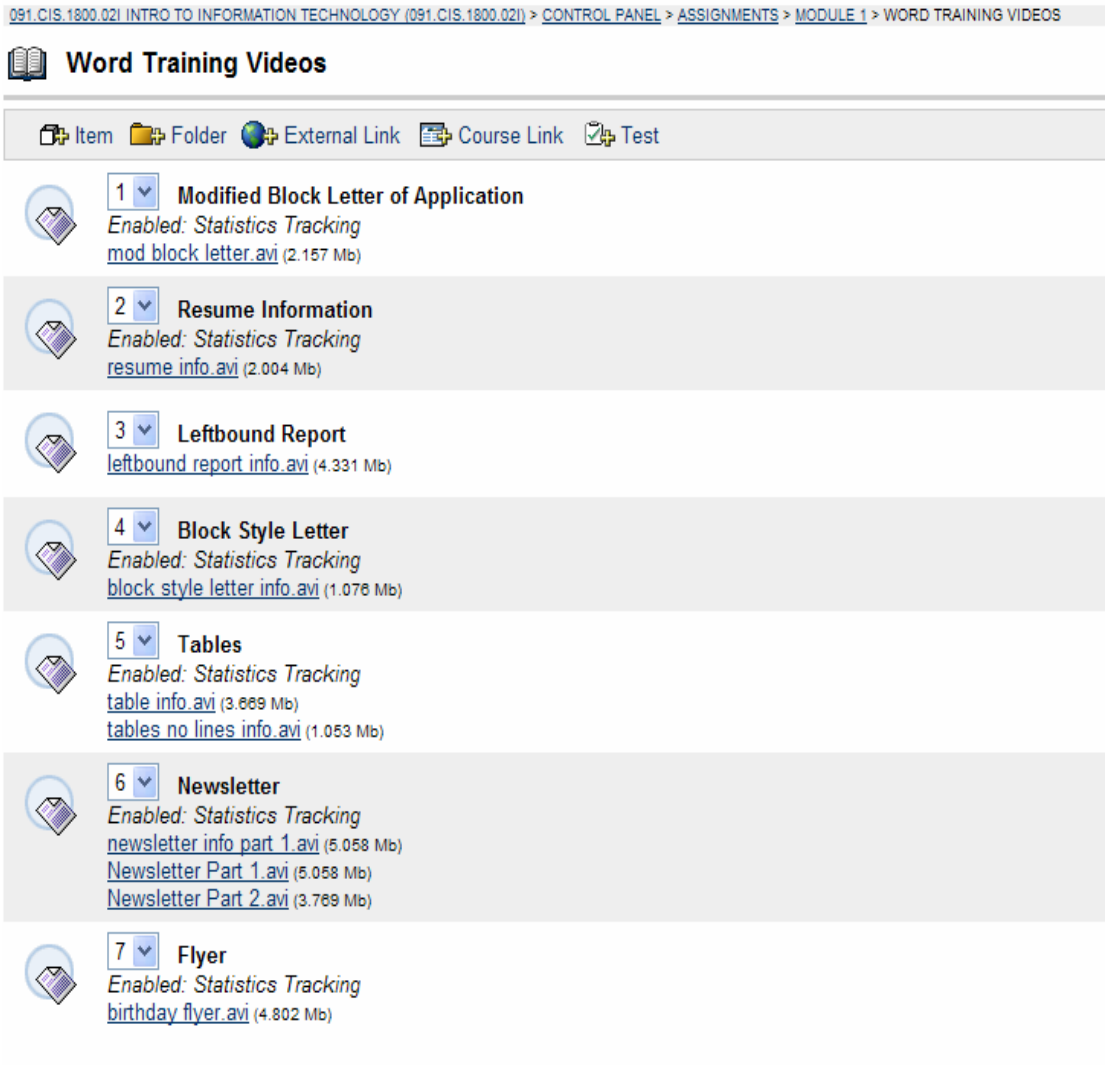
Screen Shot 1 – You Tube Video (link: http://www.youtube.com/watch?v=Yj54qthxSqA)



Screen Shot 2 – Blackboard View of CIS 1800 Modules



Screen Shot 3 – Word Training Videos with Blackboard Statistical Tracking Function



Screen Shot 4 – Camtasia Studio 5 Main Menu Screen

KNOWLEDGE-SHARING AND INFORMATION MANAGEMENT IN THE SMALL CHURCH: A DISASTER WAITING TO HAPPEN?

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Abstract

This paper examines the challenges to effective knowledge-sharing and information management practices in small churches by exploring: (1) small church characteristics; (2) knowledge-sharing and information management needs; (3) key challenges in effective knowledge-sharing and information management; and (4) the role information technology can play in averting knowledge-sharing and information management disasters. The results of the investigation will be used to develop a framework for future study of specific knowledge-sharing and information management practices in small churches.

Introduction

Beginning in fall of 2007, Small Church USA experienced a series of disruptive events that undermined the church's institutional systems and processes. A deep and divisive difference in two factions of the congregation resulted in a split that divided the membership in half. One group left the church to begin a new congregation; the other stayed to begin a rebuilding and renewal effort. The group that left the church included the minister, seven of nine elders, the treasurer, and the "younger" part of the congregation who also represented the largest contributors. Those remaining at the old church represented the more elderly membership, many of whom were on fixed incomes and less active in the operational aspects of the church.

The old church rallied quickly. A new interim minister moved in to fill the leadership vacuum. New elders were elected, a new treasurer was designated, and the church began to move forward. However, it did not take long for members to realize that the split had resulted in more than a loss of membership and financial support. Along with the group that left went much of the knowledge about church processes. The treasurer took care of the banking, accounting, and contributions. Other members who left the church provided support for the Web site and newsletter. These activities required both an understanding of basic workflow as well as knowledge of how to use information technology.

Several months later the "old" church's only office employee, a half-time secretary and member of the new congregation, left her position abruptly. With her departure, the church lost its primary user of the integrated software for managing records related to membership, contributions, and accounting. No one else even knew the passwords required to use the office personal computer.

While this is one congregation's story, the sequence of events underscores the vulnerable position many small churches may find themselves in. The purpose of this paper is to investigate the challenges of knowledge-sharing and information management in small churches by addressing the following questions:

1. What characteristics of small churches can impact knowledge sharing and information management practices?
2. What are the typical knowledge-sharing and information management needs of a small church?
3. What are the key challenges for small churches in effective knowledge-sharing and information management?
4. How can information technology play a role in averting disasters related to

knowledge-sharing and information management?

The results of investigation will be used to develop a framework for future study of specific knowledge-sharing and information management practices in small churches.

Characteristics of Small Churches

Church size is often used to generalize church characteristics. One frequently cited classification system defined by Rothauge (1986) identifies four categories of churches based upon *active membership*: family (less than 50), pastoral (50 to 150), program (150 to 350), and corporate (more than 350). USAChurches.org (n.d.), a church directory Web site, uses a "small-medium-large-mega" approach based upon *weekly attendance*. According to the Barna Group (2003), a marketing research group for church ministries, the "United States is dominated by small churches, with the average church attracting less than 90 adults on a typical weekend."

Daman (2005) identified the following 15 characteristics of small churches:

1. The small church is relationally driven.
2. The small church works through informal channels.
3. The small church relates as a family.
4. The small church works as a whole.
5. Power and authority reside in the laity.
6. Communication occurs via the grapevine.
7. Traditions and heritage undergird the structure, ministry, and culture.
8. The church functions and worships inter-generationally.
9. The focus is on people, not performance.
10. There is a place for everyone.
11. The small church values relatives.
12. The small church values generalists.
13. There is a place for everyone and everyone has a place.
14. The church has its own calendar and timetable.
15. In the small church, people give.

Several of these characteristics can impact a church's knowledge-sharing and information management practices. For example, a church that works through informal channels (#2) or communicates through the grapevine (#6) might lack standard procedures or well-documented processes. Likewise, the emphasis on relationships (#1, #9) in a small church suggests that "doing things right" may not be a high priority. Informal channels, communication through the grapevine, and an emphasis on relationships are all characteristics that could undermine a church's ability to share knowledge and manage information.

Information Management and Knowledge-Sharing Needs

Before going any further in this discussion, the distinction between information and knowledge should be addressed. Most information systems professionals would agree that information and knowledge are different. However, distinguishing between them has not always been straightforward. To avoid a long and protracted academic discussion about what the differences are, the authors will use definitions from BusinessDictionary.com:

- Information: "raw data that (1) has been verified to be accurate and timely, (2) is specific and organized for a purpose, (3) is presented within a context that gives it meaning and relevance, and which (4) leads to increase in understanding and decrease in uncertainty."
- Knowledge: "human faculty resulting from interpreted information; understanding that germinates from combination of data, information, experience, and individual interpretation."

According to Alavi and Leidner (1999), the key distinction between the two concepts is that "knowledge is information possessed in the mind of an individual; it is personalized or subjective information related to facts, procedures, concepts, interpretations, ideas, observations and

judgments." Organizations use information systems to manage information; on the other hand, "know-how" is often coded and transmitted using such vehicles as training manuals, procedures, and policies.

To understand the types of *information* important to a typical small church, the authors looked at the functionality provided by current vertical-market software solutions. A Google search was used to identify twelve different vendors of church management software. The Web sites of each vendor were examined to compile a list of functions provided by software offerings. The 12 vendors reviewed in this research include the following:

1. CCISSoftware. Church Management Software.
2. CDM+. Church Management Software.
3. Church Community Builder. Web-based Church Software.
4. ChurchPro Church Management Software.
5. Church Windows. Software for Churches.
6. CRISSOFTWARE. Church Resource and Information System Software.
7. ICONCMO Systems. Church Management Software.
8. Kingdom Tools. Church Management Software.
9. Logos Management Software. Church Management Software.
10. ParishSOFT. Church Management Software.
11. Servant PC Resources, Inc. Church Management Software
12. SUNERGO Systems. Church Information Management, Camp Management, Event Registration.

The functions addressed by the software advertised at the websites are summarized in Table 1. The functional areas included in each vendor's software solution were variable. The first three areas, *Membership*, *Donations*, and *Accounting/Finance*, were mentioned to some extent for each vendor. Beyond the first three, functionality was much more variable. *Time and Talent* and *Event* administration were the next most cited areas. Even though *Education* and *Congregational Care* are important missions of a church, they were not frequently addressed in advertised functionality by the software vendors examined. *Resource Management* was rarely mentioned.

Table 1. Church Information Needs

Area	Types of Functionality
Membership	Membership tracking Church directory Photos/pictures
Donations	Pledges Donations
Accounting/ Finance	Offering Budgeting Fund accounting Payables Payroll
Time and Talent	Committees Groups Volunteers Task assignment
Event	Registration Attendance Facilities scheduling Event notification
Education	Class registration Attendance Child check-in
Ministry/ Congregational Care	Pastoral records Visitation Music tracker Media ministry Youth ministry
Resource Management	Inventory Human resources

Most small churches probably rely on some combination of electronic and manual information systems to accommodate the wide-range of information needs. Even the small church mentioned in the introductory scenario uses a popular church management software package written for the Windows environment. The consistent presence of membership, donation, and accounting functionality among the twelve software solutions reviewed by the authors may be an

indication of the most critical information needs of churches.

While a church information system might produce a report on congregational giving, someone in the church office must have the *knowledge* about how to produce the report. Knowledge, also called "know-how," can be either explicit or tacit as described in BusinessDictionary.com:

- Explicit knowledge: "Articulated knowledge, expressed and recorded as words, numbers, codes, mathematical and scientific formulae, and musical notations. Explicit knowledge is easy to communicate, store, and distribute and is the knowledge found in books, on the web, and other visual and oral means."
- Tacit knowledge: "Unwritten, unspoken, and hidden vast storehouse of knowledge held by practically every normal human being, based on his or her emotions, experiences, insights, intuition, observations and internalized information."

For example, the knowledge needed to produce a report on congregational giving could be outlined in an office manual (explicit), or it could reside in someone's head and be passed on from year to year by word of mouth (tacit). When people leave an organization, they take with them expertise that can be difficult and time-consuming to recreate.

Key Challenge for a Small Church

Small churches share many of the same challenges as other non-profits. According to Popjoy (1992), of "all of the functions of management (planning, organizing, staffing, directing, and controlling), perhaps the one that differs the most in associations from those in business and government is staffing." Churches, just like other non-profits, rely heavily on volunteers. A small church could have as little as a half-time, paid secretary on staff. Volunteers might be used to assist with any of the functions mentioned in Table 1.

As previously discussed, small churches often work through informal channels, and communication takes place through the grapevine. In an environment where work is accomplished through large cadres of volunteers, it is easy to imagine how the scenario described at the beginning of this paper occurred when half the church congregation left. For example, the minutes of the Education Committee's monthly meetings reside on a volunteer's personal computer instead of the PC in the church office. The software process for producing the monthly newsletter is known only to the church newsletter editor who developed it. In either case, if the volunteer leaves the church, valuable information or knowledge could be lost.

As these last examples illustrate, too often small churches rely on a single volunteer to complete an activity, and there is no cross training and no documentation for anyone who will take over a project. Too often no coordinated information management plan is in place to ensure key information is maintained where it can be retrieved by church members or staff when necessary and that tacit knowledge has been captured.

In Search of IT Solutions

The informal and relational qualities of a small church combined with a reliance on volunteer staff can leave a small church vulnerable to a disaster. Of particular concern is capturing information that may reside in the hands of volunteers or knowledge that relies in their heads.

The review of twelve software vendors revealed several built-in tools that churches can employ in order to improve the communication process including the following:

- Email/Bulk email
- Bulletins
- Announcements
- Newsletter
- Calendar

While these tools can certainly be helpful in keeping a congregation informed, they may not necessarily provide useful

solutions for sharing information and knowledge and maintaining its accessibility for future use.

Some church software vendors provide intranet capabilities. Intranets use Internet technology to create private networks for exclusive use by members of an organization. An intranet can provide such services as "email, data storage, and search and retrieval functions" and can be used for such purposes as maintaining "manuals and internal directories (Business Dictionary.com)." Intranet users can log in using their Web browser to enhance information and knowledge sharing practices. For example, instead of storing committee minutes on a volunteer's personal computer hard drive, the documents can be uploaded and shared using the Intranet.

Some small churches may not be able to afford a proprietary intranet product. In these cases, a freely available Web 2.0 tool might be helpful. For example, a basic Wiki for sharing content can be created at www.wikispaces.com. Google provides a number of tools to support workgroup needs. For example, Google Sites can be used to create secure Web sites (similar to intranets) and Wikis. Google Groups can be used to create email lists and discussion groups.

Providing a technical solution is only part of the answer to avoiding a disaster. Changes in behavior are also needed. For example, if a church develops an intranet to facilitate communication, volunteers must be willing to upload their committee minutes or other documents. Training could play a key role in encouraging member participation.

Conclusion

The purpose of this paper was to examine the challenges to effective knowledge-sharing and information management practices in small churches. The use of informal communication channels and the "grapevine" combined with a heavy reliance on volunteer staff complicate the sharing process. Intranet and Web 2.0 technologies are possible solutions, but only from a technical perspective. Changes in behavior are still needed to make systems of information management and knowledge sharing effective. Developing a comprehensive information management plan is a key activity even a small church should complete.

While there are many tools available, the extent to which they are actually being used in small churches is not known. This will be the focus of the authors' future efforts.

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IS COMPLIANCE ENOUGH TO SUGGEST ACCOMMODATION – DO YOU HEAR WHAT I SEE?

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Introduction

When instructors or designers create a course for students in an online environment, it is natural to want to make the site look good. To do this they sometimes add the extra "bells and whistles" they think will appeal to students. And though that is very good in theory, it is important to make sure that every student has the opportunity to access the full content of the course. What some do not take into consideration is the fact that not everyone who sits down to use the site can actually see what is on the screen. That is when you have to ask yourself the question, do you hear what I see?

Statement of the Problem

Online courses are intended to provide education to students who cannot attend traditional on-campus classes. Are online and web-enhanced classes and class materials presented using a platform system such as Blackboard sufficiently accessible for visually impaired students?

Review of Literature

The availability of online education should be especially attractive for those with disabilities that make on-campus attendance difficult. Online courses make it possible for these people to access education without having to be physically present in the classroom (Center for Assistive Technology and Environmental Access). However, due to the highly visual context of the instruction, online courses may be more difficult for students with visual impairments. This problem is not limited simply to online courses. Instructors of many classes now use the online platform to provide assignments and resources to on-campus students.

The Americans with Disabilities Act and Sections 504 and 508 of the Rehabilitation Act of 1973 prohibit post-secondary institutions from discriminating against individuals with disabilities. Federal law mandates that opportunities provided for persons with a disability must be equally effective as the opportunities provided for others. It also specifies that qualified students cannot be excluded or given benefits that are different from benefits available to all other students (HHS - Your Rights Under Section 504 and the Americans with Disabilities Act). An addition to the Act was Title II. In Title II, some additional criteria were added. These include "effective communication," and "primary consideration of customer preferences." The Office of Civil Rights (OCR), a part of the Department of Education, has the responsibility of enforcing the Americans with Disabilities Act, as well as the Rehabilitation Act of 1973, as they apply to educational settings. The OCR is the governing body charged with hearing complaints against schools regarding websites that are inaccessible. They have used specific criteria for "effective communication" in complaint resolution agreements with post-secondary institutions. These criteria were: (1) timeliness of delivery, (2) translation accuracy, and (3) manner and medium of delivery appropriate to both the significance of the message and the ability of the disabled individual (Office for Civil Rights).

The National Center on Accessible Information Technology in Education

includes on its site some questions and answers about website requirements. One of the questions was whether a faculty member must meet accessibility standards on a website he or she develops, or is the concept of academic freedom such that it allows him or her an "out." The Center states that "it (academic freedom) commonly is thought to also encompass the right of faculty members to teach in the manner and style of their choosing" (p. 3). Though not yet ruling tested, the opinion of the National Center on Accessible Information Technology in Education is that this will not be a viable defense.

Another point of Title II is that it requires "primary consideration" of "customer preferences." This does not mean that the preference must be provided. If an alternative method is deemed by experts to be just as effective in the context in which it is being used, the preference does not have to be honored. Visually impaired students must rely in many cases on assistive technology such as screen magnifiers or screen readers. Screen magnifiers, as the name suggests, enlarge portions of the screen so that users with visual impairment are able to read the contents. Screen readers, on the other hand, do not rely at all on sight, but rather on listening. This software concept allows the reader to hear what is shown on the screen. This is delivered through a synthesized voice. All navigation is conducted through the keyboard (WebCT Course Design and Accessibility, 2001).

If students with visual impairment are taking an online course, the question arises as to who is responsible for providing any assistive technology that may be required. Since the purpose of the law is to guarantee the same opportunities, rights, and privileges as students who don't have disabilities, it is extremely questionable as to whether the university is required to provide the assistive technology for the visually impaired online student. Typically, all students (with or without disabilities) are required to have the proper hardware and software needed to complete an online course.

Blackboard has posted information on its site about accessibility compliance. Standards set out by Section 508 and Web Accessibility Initiative (WAI) were the measure for an independent audit of the Blackboard platform. These audits are conducted by third-party firms to test for compliance, which Blackboard indicates they passed (Blackboard). Also, according to the Blackboard site, when creating pages to post to Blackboard, it is up to the creator to make sure the pages are accessible.

Methodology

In order to examine components of Blackboard that might be problematic for visually impaired students, an interview with a visually impaired student was held. In this interview, the student used a screen reader to access an online course. Several different media formats were utilized in this course. Included were components created in Adobe Acrobat, Microsoft Word, Captivate, Visual Communicator, Dreamweaver, and Photoshop. The student then demonstrated to the researchers his ability to access the materials.

Results

As previously mentioned, Blackboard has posted that it is compliant based on an independent audit. One would assume that this means that students using a screen reader would have access to the materials contained in Blackboard. When we watched the visually impaired student trying to access Blackboard and the materials found there, we did not observe this to be the case. The screen reader software used by the student who assisted with this study was JAWS (Job Access With Speech). JAWS was created by the Blind and Low Vision Group at Freedom Scientific. The student told us that often just starting Blackboard is problematic when using JAWS. He told us that the machine will lock up often on start-up and that it can take up to four tries before he can actually get to the login screen. He confirmed that this was the case not only on

the computer he was demonstrating on to us, but also on the library computer and his personal computer.

Once into Blackboard, it was impossible for him to simply have the screen reader begin. He had to toggle back and forth between the JAWS screen and the Blackboard screen until the page was recognized. The screen is very cumbersome for him to navigate. As with many pages, the screen reader is reading not only the words on the screen, but it must also read the other coding on the page. This causes the listener to have to audibly pick out the words that actually have some type of meaning to the user. He was asked to select a link for a course lecture called *Lecture 4 Elements of Effective Design* that had been prepared using Visual Communicator. The following was what the user heard when trying to access the link:

> Course Content Lecture 4 Elements of Effective Design Enter Table with Link Title on Mouse over. Video lecture on mouse over , on mouse over, on mouse over, connecting dot dot dot new browser window.

When the student chose the lecture, he then got a message that Windows is protecting his machine by not allowing the download. The student then would have to use the drop down on the top of the screen that is done with the use of a mouse. He told us that this is very difficult if not impossible for him to do by himself (explain). Once he gets the video to download, the problem then becomes how to make it play. Because there was no information given besides the fact that it was the link for the lecture, he did not know what would happen next. In this particular case, since we were there with him, we told him that it opened in Real Player. He then immediately knew how to start the program. However, had we not been there he would just be waiting for the screen to be read and nothing would have happened. The same was true of the Captivate file.

The next item he tried to open was a .pdf file that was in the Blackboard course content. This .pdf file had been "protected" from copying by students. The first time he tried to open it he got the download warning. Upon allowing the download, the program closed out. He reentered Blackboard and went to the same class again. When looking at this link for the demonstration, the .pdf file opened, but it did not read. The message that he received was, "Protection failure, Open parent document." This can occur if the .pdf protected by some of the security features of Adobe Acrobat; or if the .pdf is a scanned document, which is saved as an image document.

The student said that more often than not, when using Blackboard, the .pdf and Word documents are not readable by his screen reader. If he downloads the documents and opens them, he is then able to have the screen reader read them. After this the computer again locked up and Blackboard closed. In further discussing the problems he faces with using Blackboard, he indicated that putting things on a link outside of Blackboard was really much more accessible for him. We commented that Blackboard states it is compliant with ADA standards. At this point he said, "That might be true, but being compliant does not always mean it is accommodating."

In order to conduct additional tests, the researchers tried the same access with Microsoft Vista Narration feature and the Voice Over feature on the MAC. The researchers were unsuccessful in achieving any real access to materials. The page titles of a few pages and some links would read but not with enough navigability that a non-sighted person would be able to access the content.

Suggestions

Suggestions on making web pages accessible are available at several sites. Some of the most important things to remember are:

1. Images and Animations - Since those with visual disabilities cannot see the images, it is very important to use "alt" text. This is the description of the graphic. In order to create a meaningful description, describe the picture as if you were telling it to someone on the telephone what it looks like.
2. Long Descriptions - When a short text equivalent does not suffice to adequately convey the function or role of an image, provide additional information in a file designated by the "longdesc" attribute. This can be used for charts, graphs, or complex graphics and images. There are several ways to use the "longdesc." One way is to simply follow the graph or chart with a verbal explanation that all users will see. Another way is to show a visual link that states something like, "A text description of this chart is available on a separate page." The third way is the "longdesc" attribute. This can be added to an <img> tag. This also provides a link to a separate page where a long description is available. This way, however, the link is not visible to a sighted user; it is visible only to screen readers.
3. Hypertext Links- Make sure that all link text is specific. Instead of simply stating "click here," inform the navigator of the destination. For instance, "click here for discussion board. "
4. PDF Files- Covert PDF files to HTML to allow for screen reader access. Consider a password secure alternate website for converted files for which you feel there may be copyright issues. Do not scan documents as a PDF images. Text readers cannot read text contained in an image.
5. Frames- Use a no-frames function whenever possible. This provides an alternate viewing option for those who cannot view frames.
6. Multimedia- Make sure to describe all multimedia items in detail. For instance, if a video will open in a specific software package be sure to include that in the description.
7. Java and other scripting languages- If the content of your page is not accessible when the active features are turned off or unsupported, provide an alternate location to retrieve that content.
8. <STRONG> and <EM> Tags- When possible use <STRONG> and <EM> tags to convey important information on your site. These tags allow screen readers to change inflection to show the importance of certain content.
9. Mouse- Try to use tabs to navigate your website to determine if it is easily navigated without the use of the mouse.
10. Color- Avoid using color as a singular indicator of course content.

Validate your work- Make sure to double check all work to insure that it is accessible to all students. There are helpful tools, checklists, and guidelines available from the following websites:

- http://www.w3.org/WAI/
- http://www.hisoftware.com/access/newvindex.html
- www.gsa.gov/cita
- http://validator.w3.org/

The law requires equal access for vision impaired students. Instructors should feel a moral obligation to their students, which should mean not to simply comply just with the letter of the law, but to accommodate students in the best way to allow the student to gain the same instruction as sighted students. In some cases this may mean going beyond using only the Blackboard or other educational platform, if use of the platform does not allow for the best presentation of materials for the visually impaired student.

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CAN THEY REALLY WALK THE TALK?

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Today's students, those currently leaving high schools and entering colleges and universities, are supposed to be the digitally literate generation. The group of students born between 1982 and 1991 has been labeled as "the net generation" (Jones, 2007; Oblinger, D., & Oblinger, J., 2006; Skiba & Barton, 2006).

Many students seem to feel confident with technology because they can use an IPOD and text with a cell phone. That is, these students may have confidence in their digital literacy simply because they have successfully mastered a small portion of the available technology. ("A Digital Decade", 2007; Hargittai, 2005; Oblinger, D. & Oblinger, J., 2006)

Student confidence is an important question for educators. There is ample evidence that confidence can be an asset in both learning and performance. For instance, increased confidence has long been shown to lead to increased learning in mathematics (Morris & Bowling, 1979) and sports performance (Woodman & Hardy, 2003). However, overconfidence leads to biases likely to inhibit learning and leads to poorer performance (Alba & Hutchinson, 2000).

Thus, the question of whether the general confidence of students in their mastery of technology is warranted, or if this confidence is misplaced becomes important. The answer to this question is critical in determining the goals and delivery methods of classes focused on teaching the digital literacy skills required for success in an academic environment.

Our research operationalizes this question of functional digital literacy by examining students' knowledge associated with the Internet/World Wide Web and their confidence in that knowledge. The objectives of the study are: (1) to investigate the relationship between students' knowledge of the World Wide Web and their confidence in that knowledge; and, (2) to examine the extent to which students are overconfident in this knowledge. Data collected from this study will be used to implement revisions to the subject matter taught in a computer literacy course offered at the post-secondary level.

Population

The target population of the study was defined as high school seniors and entering first time college/university freshmen in the United States. The accessible population of the study was operationally defined as high school seniors (scheduled to graduate fall 2008 or spring 2009) in a southern rural high school (1,281) and entering College of Business freshmen (0 earned hours) enrolled in a college orientation class at a small regionally accredited four-year university.

Instrument

The survey instrument was developed by reviewing items from a previously conducted study (Hargittai, 2005) and the development of questions from review of current literature (Shelly & Vermaat, 2008). Students will not be asked any personal or identifiable information. The modified instrument was divided into five sections. The first section of the study asked the respondents whether they were at least 18 years old as of their last birthday. If the respondents answered yes, then they were instructed to proceed with the survey; but if they answered no, they were to stop. For the orientation class only, the respondents were asked to provide the name of their high school and the state in which the high school was located. Student respondents were asked to check all classes that they had taken at their high school. The classes listed were Computer Science, Computer Literacy, and Business Computer Applications. For the orientation class only an additional category called 'Other' was listed.

The second section of the survey asked the respondents four yes/no questions about their internet literacy knowledge. The third section of the survey requested that the respondents provide their perceived understanding of 38 preselected internet-related items with 1-no understanding to 5-full understanding. The fourth section of the survey using multiple choice questions (objective test) asked the respondents to select the appropriate definition for each one of the 38 preselected internet-related items. The fifth section of the survey using a Likert scale (1-not at all skilled to 5-expert) asked the respondents to rate perception of their overall Internet/World Wide Web knowledge.

Procedure

In the fall of 2008 those entering college/university freshmen enrolled in the College of Business freshmen orientation section and all graduating high school seniors from a local high school were surveyed.

Graduating high school seniors: At the beginning of the class, the researcher informed the high school students that their participation in the study was voluntary and confidential. Verbal directions were provided about the study. Next, the researcher instructed the students to complete the survey. The first question of the high school survey asked the students as of your last birthday, are you 18 years old or older? If yes, then proceed with the survey. If no, stop here. The students were given 25 minutes to complete the survey.

Freshmen enrolled in the College of Business freshmen orientation section: At the beginning of the class, the researcher informed the College of Business freshmen orientation class that a survey had been launched on Blackboard (Blackboard is a web-based course management system used as a component of all courses taught at the University). The students were informed that their participation in the study was voluntary and confidential. Verbal directions were provided about the study. Next, the researcher instructed the students to complete the survey.

Data Analysis and Results

The data obtained was analyzed using appropriate descriptive and correlational statistical tests. The following interpretative scale was used:

less than 1.50—no understanding;
1.50 to 2.49—little understanding;
2.50 to 3.50—some understanding;
3.51 to 4.50—good understanding; and
greater than 4.50—full understanding.

Data collected from the two groups (high school seniors and college freshmen) was examined for significant differences between the two groups. Generally the groups were comparable, with the college freshmen performing (on average) a few percent better on the objective test. Based on the measures examined, it was decided to combine the two groups for the purpose of

this analysis. This decision was confirmed by re- running the analyses described below for the freshmen group and getting the same results as those derived from the combined group. Since the study examined first semester freshman in their first few weeks on campus, their similarity to high school seniors is not unexpected.

Measures for Confidence

Student confidence in their overall knowledge was operationalized in two ways. First, confidence was measured on a 1-5 scale for each of the 38 items related to the WWW (third section of instrument) before the student took the knowledge test. The average for these ratings was computed for each student as an overall level of confidence (AVGCONF). Second, a summary question asked the students their overall confidence (fifth section of instrument) after the objective test (fourth section of instrument) (POSTCONF).

Performance was measured as the total number correct on the 38-item objective test (PERF).

Skill was measured by summing the students' responses on the four items (second section) asking students' perceptions of their abilities to perform specific, WWW-related tasks (SKILLS).

Another measure COURSES was computed as the sum of the number of technology courses students had completed before the study. This measure is not reported below as it was not directly associated with increased performance or confidence. COURSES was significantly related to SKILLS.

The descriptive statistics for the measures are provided in Table 1. These statistics show:

- The confidence indicated after the objective test (POSTCONF) was higher than the average confidence before the test (OBJCONF). A paired t-Test showed this difference to be significant at the .01 level.
- The average number of skills (SKILLS) that the students self-reported that they could perform was 3.4 out of a possible maximum of 4.
- The average performance on the objective test was 16.0 out of a possible maximum score of 38 or 42%.

Correlation tests were conducted to examine the strengths of the associations among the variables. These correlations are summarized in Table 2. These correlations show:

- The overall confidence of students measured before the objective test (AVGCONF) was strongly correlated with all three of the other variables (PERF, POSTCONF, SKILLS)
- Performance on the objective test (PERF) was highly associated with all three of the other variables (AVGCONF, POSTCONF, SKILLS)
- PERF was NOT significantly associated with student confidence after the test (POSTCONF).

It seems reasonable for students who performed well on a test to see an increase in confidence while those that performed poorly to have a decreased confidence. To capture this idea, the difference between each student's average confidence before the test (AVFCONF) and his or her corresponding confidence after the test (POSTCONF) was calculated. The resulting variable (DELTACONF) indicates whether confidence increased or decreased. Similarly, student performance was divided into LO, MID (middle two quartiles) and HI quartiles. The resulting contingency table is shown in Table 3.

Table 3 shows the change in students' levels of confidence, grouped by performance on the objective tests. Twenty-nine students in the highest group of performers (HI) exhibited an increase in confidence while 18 showed decreased confidence. Similarly, 52 students in the middle two quartiles showed increased confidence (30 decreased) and 34 students in the lowest performing quartile indicated increased confidence (13 decreased).

Discussion

Student confidence is a two-edged sword in education. On one hand, good teachers fight to instill a certain level of confidence in their students, knowing that higher confidence generally leads to higher performance. On the other hand, too much confidence paints an unrealistic picture for students leading to reduced effort.

The data collected indicates that, as would be expected, increased confidence is associated with increased performance. This outcome is congruent with similar results in areas as diverse as mathematics and track. Performance is also significantly associated with mastery of skills.

The lack of a direct significant association between the number of technology classes taken by a student and his or her performance was not expected by the researchers. One possible explanation is that the test had a large number of items not taught in the high school technology classes.

The results indicate that the students taking the test greatly over estimated their own mastery of technology. Before the test, students were given a set of questions asking for their confidence in their knowledge in 38 specific areas. The average knowledge rating (AVG CONF) was 2.52. The students then took the test and scored an average of 42% correct. Despite this abysmal performance, the students then rate their average ability (POSTCONF) at 2.99. In fact, 34 of the 47 students who were the lowest performers rated their overall ability as higher.

A limitation of the study is the different confidence measures used before and after the test. The use of two different techniques, one an average of 32 specific measures and the other a single summary question, tends to confound the reasons for this over confidence.

Implications

This research suggests that when teaching computer literacy, instructors should place more emphasis on students learning specific skills tied to computer literacy. This seems to promote the widely held belief of best practices that students engaged in active learning are more likely to learn than those who are simply listening.

This research also suggests that teachers may need to "burst the bubble" of students before they are ready to learn. Stripping away a layer of overconfidence may help average students to realize that they need to place more effort into mastering computer literacy, as they may not know as much as they perceive they do.

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Table 1 - Descriptive Statistics for Measures

		AVGCONF	SKILLS	PERF	POSTCONF
N		200	221	196	223
Missing/Incomplete		27	6	31	4
Mean		2.5203	3.4118	16.0357	2.99
Std. Deviation		.91490	.99893	4.30548	.949
Skewness		.496	-1.701	.632	.273
Std. Error of Skewness		.172	.164	.174	.163
Minimum		1.00	.00	6.00	1
Maximum		5.00	4.00	31.00	5
Percentiles	25	1.7961	3.0000	13.0000	2.00
	50	2.4342	4.0000	15.0000	3.00
	75	3.1250	4.0000	19.0000	3.00

Table 2 - Measure Correlations

POSTCONF	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	223			
AVGCONF	Pearson Correlation	.549(**)	1		
	Sig. (2-tailed)	.000			
	N	197	200		
PERF	Pearson Correlation	.134	.304(**)	1	
	Sig. (2-tailed)	.063	.000		
	N	193	178	196	
SKILLS	Pearson Correlation	.305(**)	.410(**)	.284(**)	1
	Sig. (2-tailed)	.000	.000	.000	
	N	217	195	192	221
		POSTCONF	AVGCONF	PERF	SKILLS

* Significant at .05 level
** Significant at .01 level

Table 3 - Change in Confidence vs. Performance

		CONF		
		Increase	Decrease	Total
PERF Quartile	LO	34	13	47
	MID	52	30	82
	HI	29	18	47
Total		115	61	176

ACTIVE LEARNING AND PERCEPTIONS OF FIRST GENERATION COLLEGE STUDENTS

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Statement of the Problem

Technologies have transformed today's businesses into learning organizations. Rapid advances in technology necessitate innovative approaches in academic and workplace applications and/or processes. Arguably, today's workforce should commit to continuous learning and personal development in this knowledge economy.

In response to industry and accreditation concerns, there is a need to examine demographic (classroom and workplace) and pedagogical shifts (active learning) that influence the business curriculum. In this context, this study proposed to identify first generation college students' perceived value of active learning techniques utilized within business classes to develop understanding of virtual environments.

Review of Related Literature

Findings from industry continue to indicate that a larger number of graduates lack necessary core and practical skills required for workplace performance (Greer & Plunket, 2007; Mosley, Megginson & Pietri, 2005; Grant & Wylie, 2005; Noe, 2005; Dubrin,

2004). Based on these studies, the accreditation agency, Association to Advance Collegiate Schools and Business (AACSB) recommended business programs to utilize a pedagogical approach that blends corporate sectors' academic preparedness concerns. A strategy identified included action learning and technology in the curriculum (AACSB, 2002).

Proponents of active learning, a pedagogical approach that focuses on extending conceptual understanding to practical application of content knowledge, identifies four distinctive features that can be used to assess identified industry concerns focusing on skills gaps. These features are as follows: (1) a search for meaning and understanding, (2) a focus on student responsibility, (3) a concern with skills as wells as knowledge and (4) an approach to the curriculum which leads beyond graduation to a wider career and social setting (Dover, 2001; O'Brien & Hart, 1999; Auster, Grant, & Wylie, 2005; Marzano, 2001). The objective is to use these features during academic preparedness to build a workforce that can sustain during organizational reinvention. Moreover, make significant contributions to society driven by challenges such as, technological utilization and customer satisfaction during uncertain changes.

The notion of learning organizations mirror the aforementioned in that it provides business instructors with an awareness during academic preparation with respect to changing environments affecting organizations. Learning organizations, reflecting people, values, and systems support are able to continuously change and improve performance based upon the lessons of experience (Senge,1990). This provides organizations with a competitive advantage and intellectual capital, especially with continuous technology advances. Conversely, the challenge of graduates that lack necessary core and practical skills weaken this competitive advantage. This study explored virtual environments that have affected organizations. Specifically, we examined the influence of technology in the areas of communication; Intranet, E-mail and Groupware.

Methodology/Procedures

The study's scope was limited to general business majors who are first generation college students, first in his/her families to attend a postsecondary institution (Hicks, 2000). We explored skill gaps related to technological applications with regards to proficiency in the workplace. Technological applications referenced "electronic" offices with electronic mail, voice messaging and networked computer systems.

A focus group process was used to provide an environment of "comfort." First generation students are more likely to voice their opinions in the company of individual with shared backgrounds. This also allows individuals to reflect and react to opinions of others. These are key features of active learning as noted in the literature section. The method of data analysis involves a cyclical process; comparing and contrasting data that yields a mapping of patterns.

Conclusion

Findings evidenced industry concerns with respect to the need for academic preparedness that target skills gaps and technological applications. Findings also provided instructional material that can be adopted to address concerns focusing demographic (classroom and workplace) and pedagogical shifts (active learning). Emerging themes in terms of importance to the students regarding development of technological applications are as follow.

Student comments:

- Flexibility in order to meet individual learning needs
- Encouraging and inspiring in both written and oral feedback
- Consistent, clear information which is reviewed
- Flexible teaching that takes into account students' experience
- Allow students to challenge practice when linking theory to the real life applications
- Assignments relevant to workplace
- Going away with more than I came with

Given the limitations of this study, findings should be used to jumpstart and/or develop a checklist for course design. Other stakeholders' such as alumni and business representatives should be utilized.

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DISASTER RECOVERY PLAN FOR SUCCESSFUL EDUCATIONAL CONTINUITY

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Abstract

Disaster recovery plans (DRP) are becoming a key part of an organization's overall planning process, because they ensure continuous availability of an organization's critical infrastructure at all times. A major component of these plans involves protecting business-critical data through backups and data replication. However, many organizations today have either inadequate DRPs in place or none at all. This is a major potential hazard because data is constantly threatened by hackers, viruses or natural disasters. The risk became catastrophically clear in 2005, when Hurricane Katrina devastated the Gulf Coast, impacting countless organizations. Those companies with DRP's in place fared much better than those without such contingency plans. Thus, it is vital for every organization to have a DRP drafted, tested and implemented.

In the aftermath of Hurricane Katrina many universities have drafted and implemented DRPs. Many, however, still have not. This project focuses primarily on universities in the New Orleans area which suffered major losses of data due to Hurricane Katrina. The end results are compared with the Houston Community College in Houston, TX, which proactively developed a sophisticated DRP post Katrina, and used it to recover rapidly from the ravages of Hurricane Ike in 2008. Therefore, it is evident that DRPs are crucial for the protection of all universities.

Key Words

Data loss, Natural Disaster, Disaster Recovery Plan, Backup, Educational Model.

Introduction

Regardless of geographical location, a workplace may be susceptible to events that may cause physical damage. Floods and fires are often the most catastrophic events, but problems like hackers, viruses, and human errors also take an enormous toll. In light of recent events like Hurricane Katrina, many organizations, including universities and colleges, have begun to, or have been forced to, think about how vulnerable they can be to natural disasters. Although such institutional vulnerabilities usually impact individual well-being, some mechanisms currently in place can help protect people and businesses, and most people are comfortable with these mechanisms. Unfortunately, not all organizations consider the impact of unexpected events on the workplace and the appropriate response to emergent situations that have damaged or destroyed the workplace. A well-thought-out mechanism like a DRP can help to protect the organization's workplace and its crucial data during such times.

The objective of this project is to discuss the causes of data loss in general, effective backup strategies, recovery systems developed and their cost effects. The project intends to focus in particular on the universities in the New Orleans area which suffered major losses of data due to Hurricane Katrina.

Statement of the Problem

Disasters such as system crashes, fires, hurricanes and earthquakes, often destroy an organization's electronic files and records, crippling its ability to recover rapidly. An appropriate DRP, Data Backup and Storage are necessary to retrieve the data in case of a

disaster. However, not all organizations have a preplanned DRP and a data backup and recovery system which would help at the time of data loss. Hence, all organizations should have a well prepared DRP as well as a cost-effective and reliable data backup system established to ensure the smooth functioning of an organization.

Statement of the Objective

At the heart of every organization are volumes of irreplaceable data that are updated daily. This information must be protected, secured through backups and retrieved immediately in the early phase of a disaster. All organizations must realize that future disasters are inevitable and preparation is essential to ensure that critical data is secured and easily retrievable. Implementing measures to minimize the potentially devastating effects of future data disasters is desirable.

Review of Literature

Data is vital for any organization and no organization is immune from disasters such as disk crashes, power failures, human errors, and natural disasters that lead to loss of data. The data loss can be defined as "unforeseen loss of data or information" (Hoyles, 2007). This can have serious consequences on the day to day organizational functioning. It can be devastating, and can occur due to various reasons. Studies show that 44% of data loss is due to hardware or system malfunction; 32% is due to human errors; 14% is due to software or program malfunction; 7% is due to virus infection, malware, spyware; and 3% is due to natural disaster as shown in Figure 1 (Solid Data Corporation, 2001).

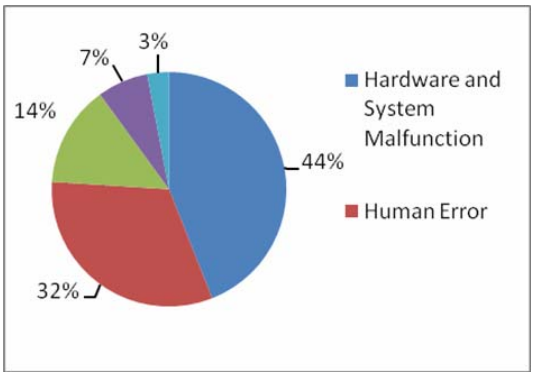

Figure 1: Causes of Data Loss

A commonly overlooked cause of data loss is a natural disaster. Although the probability of catastrophic natural disaster is small, the only way to recover from data loss due to a natural disaster is to store backup data in a separate location. Natural disasters may occur in the form of fire, flood, and lightning strikes followed by power surges.

A survey conducted by the Gartner Group, Contingency Planning and Strategic Research Group, and Price Waterhouse Coopers illustrates that 25% of all PC users suffer from a data loss each year. Despite this, 96% of all business workstations do not backup their data. Approximately 70% of small firms experience a major data loss and go out of business every year and an annual cost of $12 billion is spent on data loss along with $55 billion computer virus damage to U.S. business (Remote Data Backups, 2004). These results make a strong case for the need for a sound Data Backup and effective DRP for any organization, as both these elements sustain the life of an organization at the time of a disaster.

An essential element is a DRP which incorporates a sound Business Continuity Plan (BCP). The BCP consists of the precautions taken so that the effects of a disaster will be minimized, and the organization will be able to either maintain or quickly resume mission-critical functions (InfoSec, 2008). DRPs vary according to the needs, customers and applications of each organization. A disaster recovery plan covers the hardware and software required to run critical applications, the data that an

organization must maintain, and the steps necessary to maintain workforce continuity from remote locations (Cisco Systems, 2008).

Every organization must tailor its DRP to meet its requirements. It must be analyzed for its organizational processes and continuity needs, with a significant focus on disaster prevention. It is not uncommon for an organization to spend 25% of its IT budget on disaster recovery (Microsoft, 2008). A DRP must address three areas:

Prevention (pre-disaster): This area covers the pre-planning required — using mirrored servers for mission critical systems, maintaining hot sites, training disaster recovery personnel — to minimize the overall impact of a disaster on systems and resources. It is critical because it maximizes the ability of an organization to recover from a disaster (Chin, 2005).

Continuity (during a disaster): This is the process of maintaining core, mission-critical systems and resource "skeletons" (the bare minimum assets required to keep an organization in operational status) and/or initiating secondary hot sites during a disaster. Continuity measures prevent the whole organization from folding by preserving essential systems and resources (Chin, 2005).

Recovery (post-disaster): These are the steps required for the restoration of all systems and resources to full, normal operational status. Organizations can minimize recovery time by subscribing to quick-ship programs (Chin, 2005).

Figure 2 shows how an organization must plan its DRP/ BCP. Some important steps to follow in this process are: identifying the critical data within the organization; analyzing revenue and cost implications of a disaster recovery plan; framing a disaster recovery plan for all possible types of data loss; backing up data on a regular basis to a secondary source; replicating and/or storing a copy of critical data at an offsite location; testing the data protection and recovery procedures on a regular basis; and reviewing and updating the organization's continuity plan annually.

Figure 2: Business Continuity Planning Lifecycle

In 2006, a Computer World survey of small businesses with 1-499 employees indicated that as many as 50% of these businesses had no DRPs, with as many as 8% having no plan to set one up (ComputerWorld, 2006). An organization's survival and recovery from a disaster, however, is dependent on a well structured DRP. If this is true for a business with around 500 employees, it is far more true for a university which may have at least as many employees and four to five times as many students, and must store important data such as student registration records, fee bills, attendance, payroll, courses, projects, inventory resources, etc.

Moreover, having a DRP itself is not sufficient; periodically testing the DRP is also mandatory. Although many organizations have a preset DRP, only a few of them check their DRPs regularly. In a poll conducted in 2004, 71% of the organizations admitted that they have not tested their DRPs in the previous year (Klien & Joseph, 2007).

While a natural disaster is the least likely cause of data loss, the magnitude of devastation is the highest and hence is of concern in areas that are prone to hurricanes and storms (Oskar, 2006). Hence, the colleges, universities and other organizations in these areas require a well designed DRP and a periodical data backup. Many colleges and universities in and

around New Orleans which were the victims of Hurricane Katrina suffered a severe data loss and, lacking a firm DRP, could not resume normal function immediately.

Hurricane Katrina in 2005 forced the Gulf Coast to realize how unprepared it was for a massive disaster. The area's infrastructure was devastated, disrupting telephone communications and other elements essential to a modern economy. Thus, the storm highlighted a critical problem, especially in the colleges and universities, which lost vast amounts of critical data.

Southern University at New Orleans (SUNO) is one such example. Hurricane Katrina rendered the university's administration dysfunctional for a long time. "As levies ruptured, winds raged, and flood levels rose, college and university CIOs and administrators discovered how quickly a campus can lose all access to telephone and cell phone communication, computers, and data. E-mail and websites were down. Students and faculty were scattered across the nation with no way of contacting one another. Communication among the administration, faculty, students, and their families can be lost in a heartbeat, just when the need for a source of reliable information is greatest. Administrative computing resources can come to an abrupt halt, meaning no expediting of services, no payrolls, bills paid, or accounts received." (Blaisdell, 2006). In addition to devastating the campus physically, Katrina destroyed SUNO's information technology infrastructure. Most of the computer based data, student files, records, research, etc. vanished in the flood. No part of the country is immune from a similar situation.

Xavier University, though it did not lose any data, has prepared itself to face any future disaster by adopting some changes in its DRP. The plan is simple: a mirrored site is set up in another region of the country and can be used to access the system in case of a disaster. In response to the impact that an earthquake had on them, the University of Southern California and University of California-Berkley adopted a similar plan (Blaisdell, 2006).

Info-Tech's DRP in the Education Sector 2005 Benchmarking Report shows that a surprising 47% of universities and colleges currently have no DRP in place. According to the report, these institutions, however, acknowledge the importance of having such a plan. Sixty-eight percent of them say that they are currently in the process of planning, and 32% of schools with no current plan concede it may be up to three years before they have one in place. This may be because security and end user support are higher IT priorities than disaster recovery. On the other hand, according to Info-Tech, among the 53% of schools currently with a plan in force, a whopping 86% are improving that plan (Schaffhauser, 2005).

Result and Discussion

Table 1 shows survey responses of the ITC directors of each university. Surveys were on the level of preparation of each university's pre and post Katrina (appendix).

Cost Estimates for Backup and DRP

Table 2 shows the cost estimates for data backup of three universities. The reasons for the variations in costs are due to the backbone of infrastructure and the software being used by each university and their maintenance costs.

Outcomes/Findings

When Hurricane Gustav made landfall along the Louisiana coast as a strong Category 2 hurricane on September 1, 2008, about 1.9 million people evacuated with 200,000 being residents of New Orleans alone making it the largest evacuation in the history of Louisiana. All the universities closed their campuses for the entire week.

During and after Hurricane Gustav, websites of Xavier University of New Orleans and University of New Orleans continued to function. Although SUNO

experienced no data loss during Hurricane Gustav its local website, black board and the email services were down and students faced difficulty contacting faculty and staff for any valuable information. SUNO does not have a failover plan that includes Domain Name Services (DNS). The lack of a failover plan for DNS caused failure resolution for www.suno.edu. Therefore, students and faculty could not log on to the website. Students and faculty had to use www.sunoonline.com instead. This caused problems because everyone was not aware of www.sunoonline.com. This proves that SUNO is not yet adequately prepared for disasters and that it needs a comprehensive DRP to face such situations in future. Fortunately, SUNO was not affected directly by Hurricanes Gustav and Ike. Had this happened, SUNO would have been in a situation similar to that which occurred after Hurricane Katrina. Although its DRP has been drafted, SUNO lags in its implementation. It is recommended that SUNO act aggressively to put its DRP in place before it faces any such disasters in future.

With wind gusts approaching 100 mph, the 600-mile-wide category 2 Hurricane Ike hit Houston on the night of September 12, 2008. Though HCC was not much affected, predictably, the storm caused widespread power outage in the area, including at HCC. The power outage at HCC disrupted the college's primary data centre. However, HCC's system was equipped to cope with such a situation; the college immediately shifted the IP address of the primary data centre to the secondary data centre, and the operations thus continued with minimum disruption. Experience from other universities offer many practical lessons for institutions that are subject to such catastrophic events.

Proposed Model for Successful Educational Continuity

The model consists of ten steps; the first step in disaster planning is, of course, to acknowledge the possibility of a disaster. New Orleans will always be vulnerable to hurricanes (Blaisdell, 2006), so it is vital that all the colleges and universities prepare a contingency plan of their own to ensure that their business operations will not come to a halt. This encompasses a comprehensive, strategic approach to maintaining business operations while protecting one's organization from a host of risks including hardware failure, viruses, theft, fire, and other natural disasters. The most common mistake is not planning for a potential disaster. The reasons for lack of preparation include fear that it will cost too much or the belief that one's business is too small to be affected.

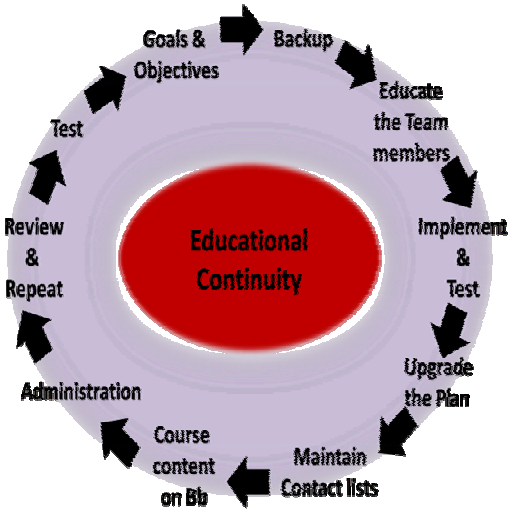

Figure 3: Model for Successful Educational Continuity

Thus, the following steps are essential for successful continuity strategies:

Step 1: Identify and analyze goals and objectives based on the needs of the organization to create an efficient plan, since disaster planning is not a one-size-fits-all concept. The primary objective of the plan should be to enable an organization to survive a disaster and to re-establish normal operations as early as possible.

Step 2: Issues like prioritizing the type of data to be stored, the type of backup needed and the time period of data storage must be considered. Choosing a secure

storage location offsite must be addressed very carefully.

Step 3: Educating the team members of the DRP and the employees with the organization's DRP is vital to mitigate the risks during the event occurrence. Every university prone to such disasters must deliver a power point presentation about their DRP including tips to be followed during the event, instead of just posting the plan on the website.

Step 4: Implement the DRP and validate the results obtained according to the needs of the organization and test the plan regularly under various conditions for its enhancement.

Step 5: Upgrade the plan periodically to reflect organizational changes and technological advancements. Technology plays a vital role in any business where data is crucial. A proper platform must be created for businesses to keep up to date with the latest technology so as to remain compatible for safeguarding their data.

Step 6: Build solid contact lists and update them regularly to establish a clear means of communication during a disaster.

Step 7: For colleges and universities, the DRP must necessitate updating all course content, syllabi, and student-faculty contact information on Blackboard each semester whether they are taught online or not. This helps the faculty and students to continue their work while going through a disaster. Otherwise, an inexpensive piece of backup media such as a writable CD could mean the difference between business disaster and business survival. Depending on the amount of critical information one needs to protect, there is a wide array of affordable media available such as flash drive, floppy disk etc.

Step 8: The administration must ensure that faculties are uploading their course content on the Blackboard every semester, and the material must be checked by the black board administrator to make sure that the complete course requirement (syllabi, course material, schedule, faculty contact information, etc.) are uploaded.

Step 9: Review, analyze, update, and repeat the entire process of step 1 through step 8 periodically, depending on the sensitivity of the data and the requirements of the organization.

Step 10: Test, test, and test. No plan is complete until it is tested. Testing helps adapt changes in the business and its technology infrastructure. In fact, testing is the only way to identify weaknesses in the plan and consequently address such weaknesses. Until the plan is tested, it cannot be considered usable.

Conclusion & Recommendations

Events such as Hurricane Katrina, Gustav, and Ike show that SUNO is not adequately prepared for the future. Though SUNO has spent thousands of dollars to maintain the latest software to run its mainframe activities, its failure to achieve its goals was evident during Gustav's landfall in south eastern Louisiana. While UNO, Xavier and HCC maintained functioning websites during the recent Hurricanes Gustav and Ike by rolling over their IP addresses to their remote web servers, SUNO failed to achieve this critical goal.

This failure occurred despite the fact that SUNO spends far more per capita than any other institutions being studied. The total annual cost of data backup and storage for UNO, HCC, and SUNO are $166,930, $576,000 and $328,300, respectively. In summary, SUNO's management must reconsider its DRP and data backup procedures for successful educational continuity. It must implement what had been drafted on paper. Developing and implementing a well-organized DRP will directly affect the recovery capabilities of the university.

The extensive analysis of the DRP's of the four institutions has led to the conclusion that the 10-step model proposed here would best serve the long term needs of any institution of higher education regardless of its location.

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Table 1: Survey responses of the ITC directors of each university

Question	Pre-Katrina				Post-Katrina			
	Xavier	UNO	HCC	SUNO	Xavier	UNO	HCC	SUNO
Is Hurricane preparedness plan satisfactory?	No	No	No	No	Yes	Yes	Yes	Yes
Did the plan achieve its aims?	No	No	Yes	No	Yes	Yes	Yes	No
Was the plan well tested and validated?	No	No	No	No	Yes	Yes	Yes	Yes
Was the content clear?	No	No	No	No	Yes	Yes	Yes	No
Are emergency contact numbers maintained?	No	Yes	No	Yes	Yes	Yes	Yes	Yes
Is there reliable offsite storage?	No	No	Yes	No	Yes	Yes	Yes	No
Was the type of data storage employed economical?	Yes	Yes	No	Yes	Yes	Yes	Yes	No
What % of courses offered online?	10%	20%	N/A	3%	10%	20%	N/A	25%
What % of course material available on Black Board or any other internet tool?	Optional	100%	N/A	1%	Optional	100%	N/A	50%
Was there a reliable backup?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Was there a data centre co-location?	No	No	No	No	Yes, Colorado	Yes, Baton Rouge	Yes	No

Table 2: Cost estimates for data backup and storage per annum for four universities:

Parameter	Xavier	UNO	HCC	SUNO
Backup Tapes	N/A*	$61,000	$15,000	$6,000
Offsite Data Storage	N/A*	$4,330	$5,000	$2300
Hardware maintenance	N/A*	$20,000	$6,000	$100,000
Software maintenance	N/A*	$21,600	$500,000	$200,000
Software Purchase for safeguarding the data	N/A*	$60,000	$50,000	$20,000
Number of employees and students the data storage can serve	N/A*	17,063	300,000	3,105
Total	N/A*	$166,930	$576,000	$328,300

*N/A = not available

PROTECTING INFORMATION ASSETS: ATTITUDES AND ACTIONS OF BUSINESS STUDENTS

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Introduction

We travel in our work, we work at the office and at home, and we access the Internet from work, school and home for personal, school, and business reasons (shopping, conducting business, ordering products, planning trips, gathering information, staying in touch with friends and family via e-mail). Therefore, it is critical to understand the importance of protecting information assets and to be knowledgeable of actions that can be taken to help prevent identity theft and fraud.

When at work or accessing a school's network, users hopefully have the advantage of "industrial strength" information security. In all other cases, however, individuals are responsible for protecting their own computer systems and information assets. According to Symantec (www.symantec.com), if you connected an unprotected personal computer to the Internet in 2003, it would be attacked within 15 minutes. Today, that personal computer will be attacked within seconds.

You can take two types of actions to protect your computer and information assets: behavioral actions and computer-based actions (See Appendix A). Behavioral actions are those actions that do not specifically involve a computer; computer-based actions relate to safe computing. If you take both types of action, you will protect your information and greatly reduce your exposure to fraud and identity theft.

Statement of the Problem

Within the last seven months, the lead author and two friends have experienced credit card fraud. Another friend's wallet was stolen and has experienced credit card fraud and has become the victim of identity theft.

The lead author shared the details of these stories with students enrolled in a junior-level information systems course that is required of all College of Business majors. The discussion about fraud and theft was held while discussing steps that need to be taken to protect computers and information assets (See Appendix A.).

A few days later, the students were asked if they had taken any action to protect their information assets after learning how vulnerable their computer and personal information was to fraud and theft. Only one out of 36 students (2.7%) responded that he had taken action.

A follow-up question, "How many of you believe that it will never happen to you?" was asked. A majority of the students raised their hand.

Purpose of the Study

The purpose of this study is to determine the attitudes of College of Business students concerning the importance of protecting information assets and their knowledge of general behavioral, computer-based, and wireless security actions (see Appendix A) that can be taken to help protect computers and information assets.

Methodology

A survey was conducted of students enrolled in four classes in the College of Business at Southern Arkansas University during the Fall 2008 semester. Fifty-five students responded to the survey. The questions asked on the survey included:

- Have you ever posted personal information about yourself or family in chat rooms or on social networking sites (i.e. MySpace, Facebook, LinkedIn, etc.)?
- Do you have anti-malware (anti-virus, anti-spyware, etc.) software installed on your computer and use it and update it regularly?
- Do you install security patches for your computer applications and operating systems regularly?
- Do you use strong passwords (i.e. more than eight characters, include numbers, mixed case letters and special characters)?
- Do you regularly create a backup copy of your computer's data?
- Do you open unrequested email attachments?
- Do you open email from people you do not know?
- Have you ever given personal information to someone you did not know and could not verify the person's identity (i.e. receiving an unsolicited phone call asking you to provide personal information for a credit card application)?
- Do you use a "reading pane" to read your email, such as in Microsoft Outlook, so every message you click on is opened in the reading pane?

Findings and Item Analysis

The results of the survey that was conducted of students enrolled in four classes in the College of Business at Southern Arkansas University during the Fall 2008 semester are discussed below. Fifty-five students responded to the survey.

Have you ever posted personal information about yourself or family in chat rooms or on social networking sites (i.e. MySpace, Facebook, LinkedIn, etc.)?

Thirty-nine (70.9%) of the respondents answered "yes" to this question. That finding is alarming when you consider the vulnerable nature of those actions.

Do you have anti-malware (anti-virus, anti-spyware, etc.) software installed on your computer and use it and update it regularly?

Forty-six (83.6%) "yes" answers were recorded on this question. It is encouraging that a large majority of the students are taking steps to protect their computers from attack.

Do you install security patches for your computer applications and operating systems regularly?

Twenty-seven (49.1%) of those surveyed indicated that they regularly install security patches. A little over half of those surveyed are leaving their computers vulnerable by not installing the patches.

Do you use strong passwords (i.e. more than eight characters, include numbers, mixed case letters and special characters)?

Forty (72.7%) of the respondents indicated that they use "strong" passwords. This is one of the simplest ways to help avoid a breach of security.

Do you regularly create a backup copy of your computer's data?

Only nineteen (34.5%) of the students indicated that they regularly backup their data. This lack of action by a majority of the students (65.5%) may be an indication of the attitude that most of the respondents don't feel like data theft or a hard drive crash will ever happen to them.

Do you open unrequested email attachments?

Only three (5.5%) of those surveyed said that they open unsolicited email attachments. A large majority of the students must realize the danger involved in opening attachments from unrequested sources.

Do you open email from people you do not know?

Only six (6.9%) of the students indicated that they open email from people they do not know. That means that a large majority of the students are taking actions to guard against SPAM, phishing or scamming messages.

Have you ever given personal information to someone you did not know and could not verify the person's identity (i.e. receiving an unsolicited phone call asking you to provide personal information for a credit card application)?

Only three (5.45%) of those completing the questionnaire indicated that they had given information to someone they did not know who asked for information over the phone concerning information needed for a credit card application. Perhaps the population of this survey has heard enough information about ways to prevent identity theft that they are careful about not becoming a victim of a scam.

Do you use a "reading pane" to read your email, such as in Microsoft Outlook, so every message you click on is opened in the reading pane?

Forty (72.7%) of the students indicated that they do not use a reading pane to read their email messages. Although using a reading pane may be more convenient, it gives the user no control over making a decision to not open an email message and may leave the user vulnerable to viruses maliciously attached to email messages intended to infect a computer once an email message is opened.

Summary and Conclusions

This study surveyed a very small population of students and only reflects the actions and attitudes of business students.

Two-thirds of the behavioral and computer-related actions that can be taken and attitudes that are needed to help protect information assets, as asked about in this research study, are being taken by at least 50% of those surveyed. However, one-third of the behavioral actions are not being taken by a majority of the students:

- Students should not be posting personal information about themselves or family in chat rooms or on social networking sites.
- Students should install security patches on their computer applications and operating systems regularly.
- Students should be regularly creating a backup copy of their computer's data.

Much work must still be done to inform students of the importance of taking the steps necessary to help protect information assets.

Recommendations

The following recommendations are made to address weaknesses in this study, identify ways to expand the research topic, and ways to encourage faculty to discuss these topics in class or to inform students in other ways:

- Replicate this study to include a larger sample of College of Business students and add additional questions to the survey instrument.
- Add another dimension to the study by surveying faculty in the College of Business. Faculty attitudes and actions regarding protecting information assets may have an effect on the extent to which this topic is discussed in business classes.

- Faculty interested in this topic should volunteer to be a guest speaker at student association and club meetings in order to raise awareness of issues related to protecting information assets.

Appendix A: Actions to Take to Protect Information Assets (Excerpt from *Introduction to Information Systems*)

Behavioral Actions

- Do not provide personal information to strangers in any format (physical, verbal, or electronic).
- Protect your Social Security number.
- Use credit cards with your picture on them.
- Pay very close attention to your credit card billing cycles.
- Limit your use of debit cards.
- Do not use a personal mailbox at your home for anything other than catalogs and magazines.
- Use a cross-cut, or confetti, shredder.
- Sign up with a company that provides proactive protection of your personal information.
- Check to see where anyone who may have used your computer has visited on the Internet.
- Never post personal information about yourself or your family in chat rooms or on social networking sites.

Computer-based Actions

- Never open unrequested attachments to e-mail files, even those from people you know and trust.
- Never open attachments or Web links in e-mails from people you do not know.
- Never accept files transferred to you during Internet chat or instant messaging sessions.
- Never download any files or software over the Internet from Web sites that you do not know.
- Never download files or software that you have not requested.
- Test your system.
- Run free malware scans on your computer.
- Have an anti-malware product on your computer and use it (ideally at least once per week).
- Have a firewall on your computer.
- Have an antispyware product on your computer.
- Have a rootkit detection product on your computer.
- Have monitoring software on your computer.
- Have content filtering software on your computer.
- Have anti-spam software on your computer.
- Have proactive intrusion detection and prevention software on your computer. Manage patches.
- Use a browser other than Internet Explorer.
- Travel with a “sterile” laptop or no laptop.
- Use a laptop security system.
- Use a two-factor authentication.
- Use encryption.
- Use laptop tracing tools or device reset/remote kill tools.
- Turn off peer-to-peer (P2P) file sharing.
- Look for new and unusual files.
- Detect fake Web sites.
- Use strong passwords.
- Surf the Web anonymously.
- E-mail anonymously. Adjust the privacy settings on your computer.
- Erase your Google search history.
- Personal disaster preparation: backup, backup, backup!

Wireless Security Actions

- Hide your Service Set Identifier (SSID).
- Use encryption.
- Filter out media access control (MAC) addresses.
- Limit Internet Protocol (IP) addresses.
- Sniff out intruders.
- Change the default administrator password on your wireless router to something not easily guessed.
- Use virtual private networking (VPN) technology to connect to your organization's network.
- Use Remote Desktop to connect to a computer that is running at your home.
- Configure Windows firewall to be “on with no exceptions.”
- Only use Web sites that use Secure Sockets Layer (SSL) for any financial or personal transactions.
- Use wireless security programs.

Notes

THE INVISIBLE GUARDIAN: WIRELESS ASSET CONTROL

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Today's businesses and organizations, both profit and non-profit, have a difficult time in accounting for their assets in real time. Traditional methods of managing assets and restricted materials are outdated and put organizations at risk. Assets are frequently misplaced or may fall into the hands of thieves or unscrupulous employees. This mismanagement results in poor stewardship of funds, inefficiencies of operation, loss of private information, and loss of strategic competitive information. The inability of having real time asset information can impact financial reporting and, in some cases, leave investors with a lack of confidence in the enterprise. This inefficient tracking of assets is especially true in the health care field where equipment is expensive, intentionally portable and mobile, and heavily used among various medical professionals and patients.

The following items highlight the extent of the problem:

- Theft of computers is listed as second in the top ten threats to computer systems (Young, 2008).
- Tens of millions of pounds (currency) of equipment is stolen from the National Health Service in the United Kingdom alone every year (Winder, 2008).
- Stolen medical equipment is suspected of being destined for Eastern Europe or Africa (Hall, 2006).
- The inability to locate expensive equipment can cost a hospital hundreds of thousands of dollars per year of lost productivity and utilization (Espiner, 2007).

Traditional Methods

To understand traditional methods of asset management, one must understand the cycle which brings the asset into the organization. When funds are appropriated, the equipment is bought and received. The asset then gets a barcode tag, and the information is manually entered into a database. Then for about a year or so, depending upon corporate policies, the assets are forgotten. Once a year, people with barcode readers inundate the facility with the task of locating all of the assets with the required inventoried barcode. This process, of course, assumes that the barcode is still intact on each piece of equipment.

Assets that are not found and are considered valuable, either due to their cost or the information they contain, will get management attention. Police reports may be needed, insurance claims have to be processed, and budgets need to be realigned to factor in the replacement of these items. In the case of strategic information (e.g., competitive plans), sensitive documents (e.g., medical records), or controlled substances (e.g., narcotics evidence) being lost; the issue is much more serious and will expose the organization to investigations and possibly lawsuits. This predicament will inevitably add substantially to the cost of doing business.

These traditional methods can result in poor stewardship of funds, inability to share idle resources, inefficiencies of resource use, exposure to theft, and the failure to manage the organization effectively. With vigilant perspective, companies should look to technology to provide the invisible guardian to oversee corporate assets.

RFID Technologies

One technology which shows promise is Radio Frequency Identification (RFID). RFID technology exists in two forms: passive and active.

Passive RFID is Commonly Used

Passive RFID is the most common method and involves securing a metalized tape to the asset. When the asset is within range of a transmitter, the transmitter's energy is used to provide a signature or code from the tag to identify the asset. This technique is used in department stores to detect theft when an item passes by transmitters located on either side of the exits. When detected, an alarm sounds and security personnel are called. The technology is simple and inexpensive. On the downside, its use as a theft deterrent is quite limited. The tags only communicate when they are in the vicinity of a transmitter (within six feet) and can be blocked (quite literally) by placing the device in a magnetic shield. The tag can also be removed by potential shoplifters unobtrusively, making the tag of limited value in theft prevention. Warehouses use passive RFID to track products on their conveyor belt systems. As the tagged product passes by the transmitter, it provides information that permits the product to be routed to its final destination. Since the asset again needs to be in close vicinity of a transmitter, it is essentially invisible when the asset is out of range. Therefore, this particular form of RFID is not reliable for inventory management since the technology will only detect the asset when it passes by the stationary transmitters.

Another form of RFID is active RFID. In active RFID, the tag consists of a power source (coin-cell battery) and active electronics comprised of a transmitter and possibly a receiver. The tag can have a point-to-point transmission range of 100 meters or more in free air. In a building, this range can be reduced to 100 feet, depending upon the building construction. In Europe, where older buildings make extensive use of solid walls (poured concrete/stone), the transmission range is reduced to 100 feet or less. In modern construction, the attenuation of transmission signal is not as severe because lighter materials are used for wall construction. This range can be substantially increased using repeaters that take a weak signal, amplify it, and retransmit the signal successfully to the final destination (hub).

The asset tag transmits at a regular interval informing a central receiver or hub of its location and identity. This information, once received by the hub, is sent to an application program which forms a database (SQL or other). In so doing, the system can oversee all tagged assets in real time. The application software can record the current location of the asset, as well as log the history of where the asset has been. The application software makes searching and documenting the utilization for specific assets very easy. The software can also be used to trigger events based on certain conditions; for example, if a particular asset is coded with certain authorized locations and breaches the perimeter, an alarm sounds in that location of the asset. E-mails, SMS messages, and remote alarm indicators can also be used to inform operators of any asset infraction. Removal of the tag can also be detected and provide an alarm signal. Software can be customized to suit any of these particular needs of the end user.

One of the drawbacks of active RFID also provides its advantage; the requirement that active RFID is active necessitates a power source. To overcome this limitation, the semiconductors have been designed with low power operation and the ability of the electronics to go into sleep mode. Power consumption is minimized by having the tag electronic go into deep sleep (very low power consumption). The electronics of the tag come out of deep sleep at regular intervals just long enough to send out an "I am here" message (duration is measured in msec). Battery life can be extended to years by using this sleep mechanism.

Applications and Benefits of Active RFID

Advances in active RFID technology have resulted in smaller size, lower power consumption, and lower cost--making the technology economically viable for many applications of wireless tags in asset tracking and management. Some potential applications of wireless tags that provide

cost-saving and safety/security benefits include:

- Watch team member location relative to team leader to determine if a person is at risk of being lost (e.g., children on school field trips, boy/girl scout camping, hiking adventures).
- Link parent and child wirelessly. If the child wanders a certain distance, an alarm activates on the child and parent before the child gets too far away (very useful in amusement parks or shopping malls).
- Track business laptops (especially those with restricted or confidential information).
- Tag expensive and/or controlled substances.
- Identify equipment location quickly.
- Monitor dementia patients in hospitals, providing more freedom for patients and opportunities for hospital staff to work with other patients (E-Health-Media, 2007).

Case Study

To highlight the benefits of active RFID, an actual pilot will be conducted with dementia patients in a hospital setting. In this particular situation, the patients will be outfitted with a bracelet that houses a wireless tag. The hopeful result will confirm cost savings by deploying fewer contract nurses to monitor these patients.

This pilot project in the United Kingdom will help offset the cost of extra contract help which can run as high as 1000 pounds per day (Collins, 2009). Dementia patients will be outfitted with a wireless tag that will identify their location and alarm personnel when patients go beyond acceptable limits, thereby notifying staff of a patient's whereabouts 24 hours a day, 7 days a week. In the coming months, the results of this pilot and further research will be available (Pistilli, 2009).

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Notes

LESS GRADING AND MORE LEARNING

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Introduction

Education courses now involve homework assignments that require technology skill as well as domain knowledge. Yet there is little pedagogical and technological support for teaching "What" (statistical mean) while simultaneously teaching "How" (use the =average (Range) function in Excel). The Gradeslayer concept describes a conceptual approach and a system implementation that helps teachers leverage their domain knowledge and helps students learn both a new topic and a new information technology skill. While teachers will allocate more time towards preparing homework, far less time is spent overall in administering and grading assignments. This approach scales to any class size, thus removing grading burdens imposed by large class sizes. The huge burden of grading lessons is removed, leaving that time free to improve the teaching.

Large class sizes have made it more difficult for the teachers to provide individual feedback and attention to each student [Chamilliard 2002, Meiselwitz 2002]. It is not unusual at the university level to have sections of classes with hundreds of students [Kay 1998]. These large classes, while financially lucrative for the schools, cause concern for teachers as it is almost impossible to have one-on-one feedback between the professor and the student.

The economic pressure to allow very large classes has led to a change in teaching philosophy from the Socratic method where the professor operates in a mentoring type environment, to straight lecture, where the topic is presented without the time to ensure each student understands. One-on-one interaction is limited and individual feedback is difficult. Piaget maintained that individuals learn through interaction with the real world and that social interaction develops knowledge [Piaget 1969].

The Socratic process provided an individualistic teaching methodology. Students were prompted with questions to explore and develop their own understanding of the topics at hand. Individual questioning by the teacher guided the learners to new levels of understanding. The Socratic method of teaching was seen as a powerful tool in developing critical thinking through self discovery. The teacher used guided questions to develop the thinking skills of the student. Each question was specifically designed for that individual to assist in the development of their learning skills.

Instructional technologies have been limited in their ability to gauge an individual's progress and offer the teacher the ability to iteratively guide the student towards new propositions using the manipulation of information. Traditional methods of instruction would require significant teacher time commitments and exceptional time management techniques to provide unique one-on-one feedback and guidance through a series of questions. The Gradeslayer prototype developments, however, will provide tools that are capable of providing one-on-one instructional feedback to unlimited number of students.

Marketplace pressures have also resulted in recent curriculum changes at all school levels. More emphasis is being placed on the integration of information technology in all courses [Horgan 1998]. It is typical for visiting committees and school boards to recommend that spreadsheet and database software be integrated throughout

the curriculum. So in addition to the usual domain knowledge (accounting, finance, management, BCIS, statistics), the student must also learn database, spreadsheet, presentation, data-mining software etc.

Common approaches to integrating technology in the curriculum include requiring introductory courses in, for example, Microsoft™ Excel. Although one must begin somewhere and the learning curve of most current information technology tools is steep, research shows that the ideal learning environment is in the context of real problems [Suchman 1987]. If the best learning takes place in context of a real problem, an ideal Macroeconomic assignment would introduce new spreadsheet concepts in the context of an economics issue, for example elasticity. The student would improve their skill set (spreadsheet knowledge) as well as their interpretation skill (elasticity).

The Primary Goal - Domain Knowledge

The primary goal of an assignment is to teach domain knowledge. The student is challenged to demonstrate their new knowledge in the context of some problem. Two things interfere with this. First, the increased pressure to infuse technology interferes with domain learning. The learning curve of desktop software applications is steep so much time must be allocated to learning the technology itself. This time and energy can detract from learning about the domain. Second, learners make two kinds of errors: syntactic and semantic [Histova 2003].

Syntactic Errors

A syntactic error is frequently referred to as a "typo" or typographical error. The most basic syntactic error is when a spreadsheet user forgets to type "=" before entering a formula. The spreadsheet software doesn't recognize the following "A1+B1" as something to be calculated, but as text to be displayed. A more insidious syntactic error is when the formula is "correct" only in the sense of being accepted by the spreadsheet software. In our context, an example is when a student intends to write =A1 + B2, but instead, enters =A1 – B2. The plus and minus keys are side-by-side on many keyboards and it's just a slip.

The challenge that syntactic errors introduce in technology intensive courses is that they confuse the semantic issues. It is difficult to understand elasticity when the formulas are not correct. A small typographical error can cause much confusion.

Semantic Errors

Semantic errors are true misunderstandings. An example is when a student does not understand how to calculate a slope. The student enters a formula which produces erroneous results. Spreadsheet software cannot know that the formula was intended to calculate "slope," so there is no way to catch this error other than to recognize an incongruity between expected and actual values. Misunderstandings at the semantic level can cause a student to waste time adjusting formulas that are technically correct, but not appropriate.

Information Technology Skills

The marketplace has increased demand for business graduates with skills in desktop software applications. Most often this is the Microsoft™ Office suite, but there is also more interest in SAS, SPSS and SAP. The intent of this article is to focus on spreadsheet assignments using Microsoft™ Excel.

The Gradeslayer System

In use for seven semesters, the Gradeslayer system manages the distribution, grading, and feedback of spreadsheet homework assignments. The prototype system is designed around some simple steps:

Step 1 – The Perfect Answer

The professor prepares a template containing the perfect answer and decides what is important in the assignment. By spending a little more time on the assignment, we can test different levels of learning, both semantic and interpretive kinds of understanding. This preparation takes more time than before, but our experience shows that, for example, with a class of 200 students, the grading time is reduced by over 90% [Shepherd 2005].

Step 2 – Create Grading Rule Criteria

The teacher creates grading rules for the perfect answer. The Gradeslayer tool has checkboxes the teacher uses to indicate which aspects of the assignment should count. The teacher can also assign grade weights to each criteria being checked. Our context being spreadsheets, the Gradeslayer set-up options include formula, value, and cell attributes such as font, style, or colors. Gradeslayer can focus on syntactic issues: is the formula correct? Is the answer correct? Is the data displayed or formatted correctly? Gradeslayer can also focus on semantic issues: what data meets a certain criteria? What does this chart mean? How might this be interpreted?

Spending additional time during rule development ensures clear grading criteria are maintained. It is during this process that the teacher can decide on the level of feedback to each student. Assignment intent and teaching philosophy are handled by allowing the teacher to provide simple feedback: "This is wrong – fix it" to "You did not calculate the average correctly. To do this you need to…."

Step 3 – Create a Student Template for Distribution

Having finalized assignment creation, the teacher creates a blank template by removing from the perfect answer those items to be completed by the student. Instructions are clearly given as to what the student must complete to receive full assignment credit.

Step 4 – Distribute the Assignment Template for Completion

In the prototype Gradeslayer system the blank template assignment is distributed to the student via common directory, email attachment, or drop/return box systems. The web based version of the product, available Spring 2009, will remove this step and allow assignments to be picked up and dropped off on the web. The new web based distribution system removes all local architecture problems for teachers. Common barriers to mass distribution of the prototype were: the lack of an email system to send these files out or, we the lack of a file distribution system.

Step 5 – The Student Completes the Assignment

In the current Gradeslayer prototype system, the student completes the assignment and returns it via the common directory, email attachment, or drop/return box systems. The web based system will allow the students to upload to a central grading point on the web.

Step 6 – Grade that Assignment!

In the prototype desktop system the teacher could (once or twice a day) grade all files in the submissions folder. The Gradeslayer system checks answers, based on the rules created by the teacher i.e. formulas, formats, ranges, and correct answers. On a typical desktop system, the system grades 200 workbooks in under 2 minutes.

Part of the prototype functionality of the system includes email notification. After grading, the students are informed via email of their assignment grade and exactly what was wrong. The student email contains feedback directions pertaining to each of the student's deficient areas in the assignment (a task that would be monumental for any

teacher to consistently grade hundreds of students on hundreds of criteria.)

As part of the grading process, the Gradeslayer prototype creates feedback for the teacher that allows them to focus on those areas within the assignment where the majority of students fail to understand a concept or fail to grasp a technology skill. This enables early diagnosis of problem areas and helps the teacher clear up confusion and give extra instruction in specific areas. The teacher can address these deficient areas either in class or in a special session with the students.

The web based system will grade each student assignment immediately as the assignment is dropped on the web site. Immediate feedback from the web will remove time delays in the desktop system where the student was relying on the teacher to manually run a grading process.

Step 7 – Review, Repair, and Return the Assignment

In the prototype Gradeslayer system, the student reviews the feedback, amends the file and returns the assignment to the teacher for re-grading and possible re-submission back to the student with further directed instructions on areas where the student has failed to comply with the assignment instructions. Iterative assignment grading is an option for the teacher.

Iterate Early and Often

The creators of Gradeslayer believe that one of the most important factors in learning is iteration. Humans learn best in small, iterative steps. Because the Gradeslayer prototype tool grades so quickly, the part of an assignment that used to take the most time (namely grading) now takes the least amount of time. This enables the teacher to give feedback "early and often." Rather than accepting homework only once right before the deadline, Gradeslayer allows the teacher to accept assignments early and grade them often.

Gradeslayer believes that this contributes to learning in a fundamentally important way. The nature of technology integration is that small errors (syntax) can lead to large penalties (one formula is wrong and all dependent cells thus also wrong) [Histova 2003]. Although we live in a world in which small errors can certainly lead to large consequences, the creators of the Gradeslayer process do not believe this is the best way to teach. On the contrary, Gradeslayer believes that allowing iteration on assignments helps the student find syntax errors which have resulted in serious semantic errors. Clearly the syntax must be correct before the semantics can be considered correct. Students cannot speak intelligently about elasticity if the formulas that create data used to understand that concept are incorrect.

Once the syntax is correct, how can we also evaluate semantics? Gradeslayer has discovered that by attention to learning outcomes and careful phrasing of questions, teachers can use syntactic markers to communicate semantics. For example, referring to a table with data, one can challenge the student to "color the cell bright green for all cells that show inelastic demand." To get this question right, the correct technology skills must be in place (right formulas - syntax) and the domain concepts must be understood (elasticity - semantics).

By allowing iteration, the student receives feedback on both the "how" and the "what" of the assignment. This Socratic style feedback is directly related to the skill level and competency of each student. The ability Gradeslayer to manage large numbers of students not only allows schools to maintain the economic benefits of larger class sizes, but begins to focus more closely on individual performance and instruction.

A counter argument to allowing iteration is that students must learn how to get it right the first time. The educator creators of Gradeslayer state the following:

> "Our experience with under graduates causes us to be more interested in the lower 99% than the top 1%, who indeed

are capable of getting it right the first time. We agree that there are certainly times to teach that precision is needed right now, but that lesson is not the most important lesson and we believe most students benefit more from a gradual and iterative approach."

The Gradeslayer Hypothesis

The Gradeslayer developers propose that *assignment iteration* decreases technology errors (those errors that fog the interpretation of economic data - *syntax errors*), improves technology competence (I can repeatedly generate correct economic formulas), and improves domain knowledge (I understand how to interpret this economic data - *semantic errors*).

Conducted during the academic year 2006 and involving regular and online Macroeconomics and Microeconomics courses, data was collected from two self selecting groups. The first student group chose to use an iterative learning approach. The second student group chose to submit single submissions of the required excel assignments. The iterative assignment option was offered to all students. Students who iterated at least once during the semester were counted in the iterative group. No measurement of student motivation was made during the summer and fall courses. A motivational assessment was administered in the spring semester of 2007. Self selection and use of iteration might imply a more motivated student.

The students took one of two routes: Iteration or No Iteration. A summary of the differences in each rout appears below.

Iteration Group	***V***	***No Iteration Group***
Feedback		No Feedback
Multiple Submission		Single Submission

Iteration Improvement Measurements

- Syntactic - score change
- Semantic - Post-test Exam Score
- Syntactic - Post-test Excel Skill Set
- Student Evaluation of process

Iterative Feedback and No Feedback

Feedback was conveyed to those who chose to iterate via email. Email feedback error messages were classified as either: syntax (SY) or semantics (SE) based on the requirements of the assignment.

1. Syntax feedback typically dealt with Excel skill issues; such as the student's inability to create a formula. Syntax feedback instructions were designed to specifically guide the student in correcting the syntax error prior to making any interpretation of the data for the assignment.
2. Semantic feedback typically dealt with interpretation issues surrounding the data; such as elasticity ranges. If the data were correct, and the student misinterpreted that data, then instructions were given on where to focus to correct this misinterpretation i.e. inelastic data is less than 1.

In addition to the syntax and semantic feedback, the emails weighted the student errors showing the student where the greatest percent of their grade was missed. This allowed the student to focus on the errors of greatest magnitude, and thus offer the student the best opportunity to improve their grades. Careful consideration was given to feedback to ensure that prior dependencies were noted so that cascading errors could be tracked.

Students choosing not to iterate received only the first graded email and chose to take the first and final grade for their assignments.

Current Research

Sosin and Goffe [Sosin] note that while the use of computers and the web within the classroom has increased, that there is hesitancy for instructors to use computer modeling tools to dynamically test students understanding of economic concepts. Resistance, they maintain, comes in two forms: both instructor and student hesitance in using the new technologies. The difficulty

in implementing these new techniques is compounded by two factors: the instructor must redefine modeling assignments to convey the economic concepts, and the student must overcome poor technology skills to be able to use the modeling technique.

Experimentation within the classroom with assignments and models that allow the student to build data and understand relationships helps students improve both their attitudes and understanding of economic concepts [Grimes 1993]. The problem then becomes, how might the instructor "crest the technology wave, increase modeling within the economics course load, and reduce student resistance to learning new technology skills." Sosin and Goffe [Sosin] discuss the need to also measure improved performance on the part of the student i.e. is the technological effort worthwhile?

Five years of data collection and program development at Abilene Christian University have produced the Gradeslayer prototype system that addresses the concerns of instructors wishing to design, implement, and measure the use of technology in the classroom modeling environment. Shepherd and Reeves [Shepherd 2006] detail the prototype system in their paper "How to Structure and Evaluate Information Technology Assignments."

The instructor distributes model templates to students who complete the economics assignment. The students return the assignments to the instructor. The instructor then automatically grades and responds to each student at an individual level. Grade time is reduced to fractions of seconds reducing the grading burden considerably. With the burden of grading removed, assignments that are submitted early can be graded, feedback generated at the individual level, and error information returned to the student for review via email, allowing correction and possible resubmission by the student. Feedback design is important and requires the instructor to spend more time defining the requirements for the assignment. Here it is up to the instructor to define the types of errors i.e. incorrect formula, failure to provide formulas, failure to use the right function, and failure to interpret the data correctly. Additional presentation skills can be developed at the instructors request to enhance the student's ability to present visibly pleasing data in formats that convey the correct interpretation of the data i.e. graphs, titles, and data formats.

Once problems with feedback are reduced, and the ability to address individual errors is addressed, email becomes a powerful tool in correcting modeling errors. Iteration now becomes manageable and in fact desirable.

With the submission of electronic assignments came the need to step up the students skills in managing data movement over the web. Experience in using the Gradeslayer prototype system showed that strict rules with regard to assignment submission actually enhanced the student's ability to diagnose delivery problems i.e. in the drop box by 11:55 pm on due date. Delivery methods could vary; ftp, Blackboard file move, Explorer copy, Explorer move, Save to from Excel, Save as from Excel. All students became critically aware that on-time delivery of a correct product had its benefits - a good grade.

Novak, Patterson, Gavrin, and Christian [Novak 1999] first suggested that students would benefit from interactive activities in the classroom accompanied by web based resources that helped the students develop basic economics skills. They defined this technique as JiTT or Just-in Time Teaching. The basis of JiTT is that class activities and homework should encourage outside development by the students, provide quick feedback, and allow the instructor to modify future classes and assignments to address learning deficiencies.

With grading and feedback instantaneous to students, the instructor is able to identify problem areas quickly, refocus either class instruction, and or redesign future assignments to follow a track that helps the students clarify learning problems. Simkins and Maier [Simkins

2004] developed an innovative teaching technique in their introduction to economics classes that designed future classes based on question feedback from students. The prototype Gradeslayer system can be used both in (where students have access to computers) and outside the classroom to determine exact areas of deficiency. Instructors are presented with weighted errors and can focus attention on correcting errors in semantics or syntax based on full class responses to assignments i.e. 42% of the class cannot identify the inelastic range of this data and 15% cannot correctly create the formula for elasticity.

Research in the computer science area has shown that Web-CAT automatic grading systems help students focus their efforts through graphic representation of the students' relative position within the class allowing the students to iteratively improve their assignments [Edwards 2006]. They maintain that students need to not only see their problem areas, but that they need to be able to relatively place themselves in positions of comparison to other students on the same assignments. Edwards [Edwards 2003] maintains that this feedback is also invaluable to the instructor as it helps focus the instructor on areas of deficiency thus allowing a modified JIT teaching approach to resolve areas of deficiency.

Malmi [Malmi 2004] maintains that "it is often much better to get instantly even simple feedback than to get advanced human feedback many days afterwards, or even worse to get no feedback at all." The purpose of Gradeslayer is to provide this feedback on a timely basis. Malmi's research also directed further research be done to focus on the types of errors involved by the students that limit their understanding of the course content. Gradeslayer supports Malmi's request for error tracking through data collection at the error and feedback level. The teacher is now empowered with the ability to assess and analyze error data to adjust teaching methodology.

The ability of the Gradeslayer system to categorize errors based on instructor requirements is a major step forward in removing barriers to learning while enhancing student interaction and feedback so as to remove these errors.

Findings

Several analyses were conducted to examine the effect of student iteration on learning and performance. In the first analysis, the number of iterations required (for those students that chose to iterate) to achieve an acceptable grade across sixteen different assignments was examined. The range in the number of iterations was 19 (high of 19 to a low of zero). An analysis of variance was conducted to determine if there was a significant reduction in the number of iterations performed across the sixteen assignments. Results indicated that there is a very significant reduction in the number of iterations performed by the students as their experience with the assignments increased ($F = 21.583$; $p < .05$ with 3, 281 df).

A second analysis examined what effect choosing (or not choosing) to iterate had on the students' grade. Of the 44 students participating in this part of the study, 39 chose to iterate and 5 chose to complete the respective assignment only one time. An independent samples equality of means t-test was performed after pooling of the respective variances. The average total points for those students that did not iterate were 183.6 and those that did iterate were 234.41 (out of a possible 300 points). Results indicated a significant difference in the total number of points scored ($t = -2.725$, $p < .05$ with 42 df).

An independent study by Phillips [2008] looked at student comparisons of both manual and automated grading practices. Phillips findings demonstrated that:

> "…the more rapid, more detailed feedback improved student assessments of interactional justice, which assesses the value and relevance of the feedback being received. The results also demonstrated that students perceived higher levels of procedural justice, meaning that they believed the automated grading process provided a

more equitable grading process than manual grading. Finally, automated grading was associated with higher levels of distributive justice, meaning that students perceived higher levels of overall grade fairness when automated grading was used."

Conclusion

Tools are now available that provide Socratic style feedback related to the skill level and competency of each student. The focused use of the Gradeslayer product provides feedback that enhances learning through iteration. The ability of this tool to manage large numbers of individuals allows us to maintain the economic benefits of larger class sizes, but begin to focus more closely on individual performance and instruction.

The successful application of this tool enhances the technology skills required for the business world, and the subject knowledge skills required to successfully fulfill course content requirements. The tool and methodology also improves the students' learning experience by reducing frustrations and feelings of injustice with the grading process.

Finally, this tool facilitates a change of focus in instructional methods that leads to an improved quality of teaching experience. As professors become comfortable with this tool they are able to focus on what they need to teach students, rather than the drudgery of grading. By spending less time grading and more time on lesson preparation, teachers enable students to learn domain knowledge and technical skill.

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Notes

COBOL: EXCELLENT HISTORY AND GREAT FUTURE

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History

In 1952, Grace Murray Hopper began a journey that would eventually lead to the development of language known as Common Business Oriented Language (COBOL). She began by developing a series of programming languages that became more and more like natural language. The language used phrases to express the operations of business data processing. FLOWMATIC was the result of this evolutionary journey.

Through the 1950's, other computing leaders were also working through the challenge of creating a practical business language. IBM had produced a language named COMMERCIAL TRANSLATOR.

In 1959, an industry-wide team was assembled to formulate a common business programming language. The Conference on Data System Languages (CODASYL) led by Joe Wegstein of National Bureau of Standards (now National Institute of Standards and Technology - NIST) developed a new language, and created the first standardized business computer programming language.

COBOL was developed under the auspices of the U.S. Department of Defense in cooperation with computer manufactures, users and universities. The initial specifications for COBOL were presented in a report of the executive committee of CODASYL in April 1960. It was designed to be business problem oriented, machine independent and capable of continuous change and development. COBOL is widely used by industries and government. with applications that include: Inventory management, Order Processing, Accounting, Retail, Shipping, Manufacturing, Insurance and Financial firms.

Since 1960, COBOL has undergone considerable updates and improvements and has emerged as the leading data processing language in the business world. The standard language specification has three levels low, middle and high, so that standard COBOL can be implemented on computers of varying sizes.

Despite the attempts at standardization, variations in COBOL implementations continue to exist. Most deviations or "extensions" are intended to take advantage of hardware or environmental features which were not defined in the standard definition.

In an attempt to overcome the incompatibilities of the different versions of COBOL, the American National Standards Institute (ANSI) in 1968 developed a standard form of the language, known as the American National Standards (ANS) COBOL. The institute revised this version in 1974 and again in 1985.

International Organization of Standardization (ISO) and ANSI committees completed the revisions by 2002. These revisions include support for object-oriented programming, XML

generation, and parsing and calling conventions to and from non-COBOL languages such as C and Java. The next COBOL standard is well on the way; the initial draft was circulated in 2005, and the approved standards is scheduled to be published in 2008.

Statement of the Problem

The Department of Management Information Systems (MGIS) of the College of Business at Southern University at New Orleans currently requires six hours of COBOL programming coursework. The faculty is currently considering whether to combine the two courses into one and offer three hours of COBOL programming as an elective, or to eliminate the course entirely from the curriculum.

Purpose and Methodology

The purpose of this study was to determine the demand of COBOL programmers for real world applications. Data were gathered from the primary and secondary sources. Anecdotal data is also used.

Related literature

Analyst firm Gartner research, estimates that applications managing about 85% of the world's business data are written in COBOL. Gartner further estimates that there are approximately 90,000 COBOL programmers in the U.S. and the annual growth of COBOL code over the next four years will be 5 billion lines. These statistics, coupled with the new COBOL 2002 standard, underscore the market value for COBOL products and services, such as those offered by Micro Focus. Micro Focus capitalizes on the prevalence of legacy applications written in COBOL by helping companies to protect their existing technology investments by transforming legacy systems into Internet- and client/server-ready applications.

COBOL 2002 adds significant new features to the COBOL language including:

- User Defined Functions
- Object Orientation
- National Characters -- Unicode
- Multiple Currency Symbols
- Conditional Compilation
- Cultural Adaptability (Locales)
- Dynamic Memory Allocation
- Data Validation Using New VALIDATE Verb
- Binary and Floating Point Data Types
- User Definition of Data Types

The draft standard includes the following new features for COBOL 2008:

- Dynamic tables - tables that grow as needed
- Function pointers
- Any-length elementary items
- Increased size limit on non-numeric literals from 160 to 8191 characters
- Locale phrase added to upper-case and lower-case functions
- Structured constants
- Functions that support Dates in ISO 8601:2000 Formats
- Allow <> As Synonym for NOT EQUAL TO
- Method overloading

About Micro Focus

Micro Focus is the industry leader in COBOL development solutions spanning traditional maintenance and

program understanding to business rule mining, Web-enablement and user-interface transformation. With 70,000 licensed users at more than 7,000 sites around the world, Micro Focus offers unsurpassed breadth of platform support, performance and scalability, and the most comprehensive suite of development and integration environments to help customers succeed in taking full advantage of the power of their legacy systems. Founded in 1976, Micro Focus is a global company that employs more than 450 people worldwide, with principal offices in the United Kingdom and United States. For more information, visit www.microfocus.com.

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Findings

COBOL applications still run the majority of business transactions. However, many of these applications moved to the contemporary platforms like Windows, UNIX or Linux as these servers have matured. Over the years COBOL has evolved dramatically, this in part has led to COBOL being the most pervasive language in business. Today the majority of business applications are still written in COBOL, not C or Java

- COBOL applications still process 75% of the worlds business data
- Estimates suggest that in excess of 200 billion lines of COBOL still exist today
- Gartner has estimated that between 2001 and 2005, 15% of all new application functionality and application maintenance would be carried out in COBOL – this equated to 5 billion lines of new COBOL being developed per annum during this period
- A recent (2006) Computerworld Survey of 352 Companies found that 62 percent said they still use COBOL -- and 75 percent of that 62 percent said they use it "a lot." Moreover, 58 percent said they are using it for new application development.

Conclusions

Lemmon says with over two million people involved with COBOL around the world and the total investment in COBOL applications, staff and hardware estimated at over $5 trillion, COBOL is here to stay. There is, therefore, a desperate need in SA for a greater focus on COBOL." While the banks are training over 150 COBOL developers a year, there are no COBOL training institutions currently preparing programmers to quickly be able to meet the changing business demands from organizations on their internal development environments," he adds.

Peter Anderton, Director: Application Development for Micro Focus UK Product Solutions says a key need in the world of COBOL today is skills.“The key challenge for companies using COBOL is going to be finding people with experience in using COBOL in a corporate environment," he says.

While some have written the language off, Anderton says it is

important to remember that COBOL is pervasive across business, comprising 80% of the currently active computer code globally, with 75% of all business data around the world being processed in COBOL applications. Furthermore, 25% of COBOL applications around the world are being extended and applications written in COBOL account for 5% of all new applications being written.

According to a survey of CIOs by technology provider Micro Focus, more than 75 percent said they intend to recruit COBOL programmers over the next five years, but 73 percent said they're having a hard time finding such programmers. COBOL was invented in 1959 as an alternative to the most popular programming language of the day. Still, the need for talent to work with legacy systems is apparently a compelling one in higher education. Micro Focus, which specializes in enterprise application management and modernization solutions, said that 22 colleges and universities have signed on for its ACTION initiative, which, among other things, promotes the teaching of COBOL in an effort to provide support for the skills needed to maintain legacy systems.

Recommendation

The following recommendations are based on the anecdotal data:

- The College of Business at SUNO should realize the investments in COBOL and the employment opportunities for the students in the industry. While COBOL code is cumbersome, there is no other language can support file management like COBOL**.** So we need to educate and offer the course to the students;
- We should invite the promising local, regional, and national employers of future workforce, as guest speakers, to offer seminars to faculty and students on value and applications of COBOL in industry, business, and elsewhere;
- Finally, College of Business should realize that there is a considerable demand for COBOL programmers in industry and that, therefore, it is incumbent on them to offer COBOL as a required course.

Implications of the Study

The results of this study should ease the decision process whether to offer COBOL as a required course or as an elective.. The Colleges should realize that, with the new developments of this language and the new ANSI standards, COBOL is not just for mainframes anymore and is designed to work on Microcomputers and with many cross platforms.

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Figures 1-4 illustrate the use of COBOL in respective organizations:

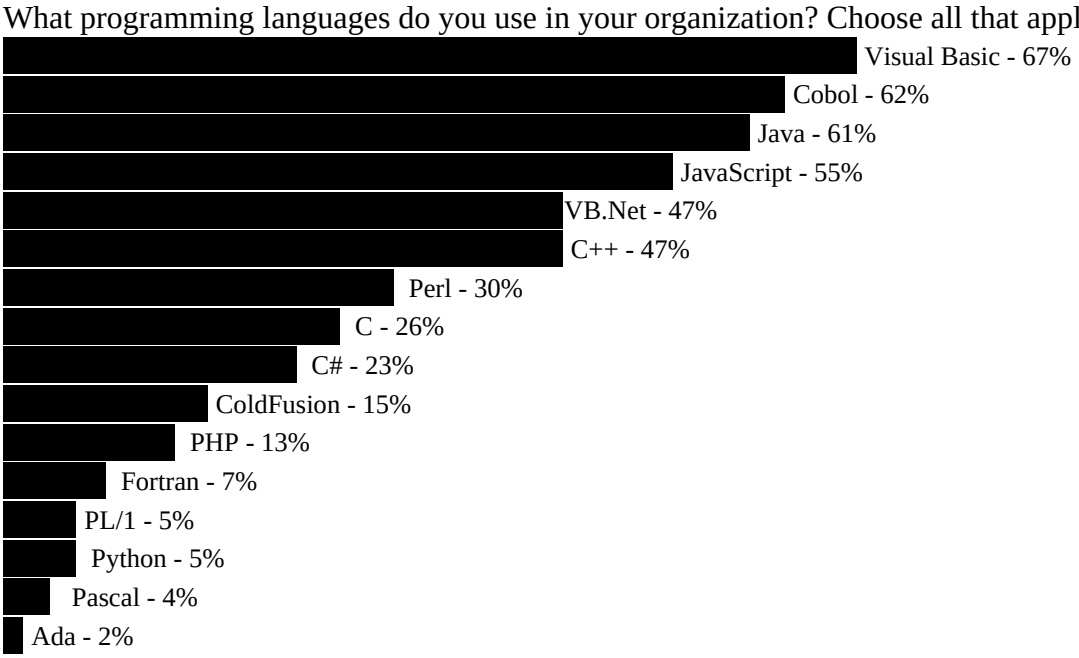

Figure-1

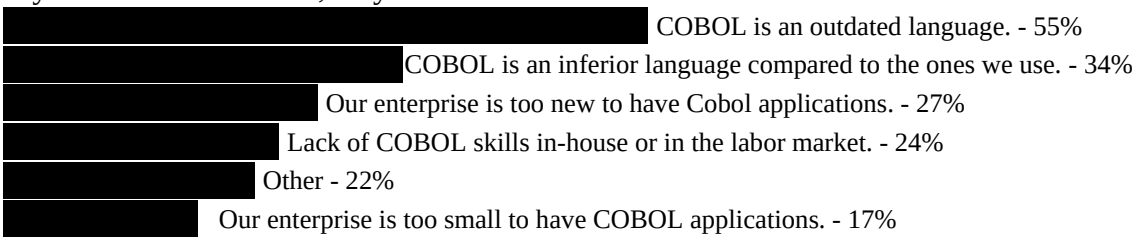

Figure-2

If your organization uses COBOL, how much internally developed business application software is written in COBOL?

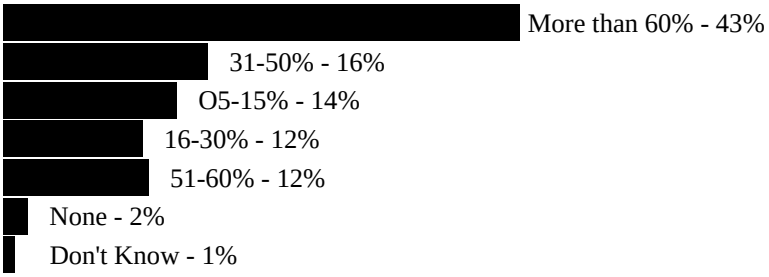

Figure-3

If your organization uses COBOL, are you using it to develop new business applications?

Figure-4

Source: Computerworld survey of 352 readers October 4, 2006