UTILIZING THE WEB TO ENHANCE STUDENT ENGAGEMENT AND ACHIEVEMENT

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Abstract

The field of education is experiencing a rapid shift as internet-enabled distance learning becomes more widespread. Often, traditional classroom teaching pedagogical techniques assume competencies and application expertise that may or may not be present in a group of students. A traditional college undergraduate entry-level class might see a student attrition rate of 5-10% or higher, some simply from the students inability to use required business office software applications to do the required work. Colleges and Universities have a vested interest in “biting the bullet” and ensuring that their students are literate in the use of business applications software for word processing, spreadsheets, presentations and database access. This is because: a) the students are effectively part of the institutions networks as end-users, and b) because preparing students for life after college is an implied and accepted part of the role of the educational institution.

Various faculty at Mount Olive College and Triton College are addressing the challenge of technology/business applications literacy by implementing a new e-learning solution. A customized, self-paced, web-based end user digital security awareness tutorial has been created. This interactive learning activity reinforces student retention by providing questions at the end of each learning module to enhance retention. As students become proficient at using security best practices, their proficiency, confidence, and student engagement in learning the class material increases. Since more classes require the use of computing technology in completing assignments, students enhance their progress throughout their undergraduate program and increasing the probability of program completion. Faculty at Mount Olive College and Triton College have developed a research tool in order to study student perceptions of the online tutorial’s effectiveness.

The course instructor is able to shift their time and energy from “putting out fires” to focusing on higher-level feedback on assignments and administrative functions. Since more classes require the use of application software in completing assignments, students take this newly acquired problem solving approach to other situations and courses, enhancing their progress throughout their undergraduate program and increasing the probability of program completion. This survey has been developed to study and quantify the student perception of the usefulness of the MS Office 2010 tutorial.

Keywords: Asynchronous, distance learning, best practices, education, web-based tutorials, e-learning strategies, undergraduate, innovative, capstone, experiential.

1 INTRODUCTION

An increasing number of post-secondary institutions are requiring some type of computer literacy for their students. Even though the technology is available, are educators and students ready? Traditional entry-level classes might see a student attrition rate of 5-25%, while the same teaching pedagogy in an online environment for the same class at the same institution can experience dramatically higher student attrition - 45% or more [1]. Additionally, several regional focus groups consisting of major employers from New Bern, Greenville, and Wilmington, North Carolina [2] indicated that students needed more training with the MS (Microsoft) Office productivity tools including advanced spreadsheets and database software (i.e., MS Excel and Access). Eighty percent of enterprise customers use a version of MS Office for worker productivity and collaboration, with only 8 percent using alternatives such as Sun StarOffice, Google Premier Apps, Lotus Symphony and Zoho [3].

As Murray [4] notes, to be functionally literate in the workplace, a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information. The leadership of Mount Olive College feels it is important that students’ computer skills...
improve as they move through their college education and that the skills they learn are what employers need them to have. And this needs to be accomplished with finite institutional resources, leveraging the potential of online classes while minimizing the high attrition associated with online classes.

1.1 Significance of the Problem

There have been significant changes in pedagogy methods due to the presence of the Internet and other widespread computer usage [5]. These changes have created a more visual learner that in turn affects the delivery of what was once considered traditional lecture material. A crucial aspect of student learning - student engagement – is a key attribute of program quality [6]. Instructors must build lessons around interactive media to create a more engaging environment for the student than the traditional classroom lecture.

Using the World Wide Web means that the teacher loses some control with e-learning. Their role of knowledge holder shifts to that of stimulation of learners (p. 990). The knowledge is put forth but it is the student responsibility to accept it. The traditional lecture classroom allows the instructor to put forth knowledge as established by departmental learning goals. Distance learning allows the instructor to put forth the knowledge but it is not delivered verbally to students in most cases making instruction seem somewhat impersonal (p.990). As technology increases and the presence of online education increases, instructor goals are bound to shift toward online learning. This means a shift in their pedagogical methods and an increase in their own technological knowledge that result in the role of facilitation and support of learners.

Since more classes require the use of application software (i.e., MS Office) in completing assignments, student proficiency with business application software is critical to ensure progress throughout their undergraduate program. Today’s high school graduates have been immersed in a technology rich society. However, the type of technology they have been exposed to may not be the type required to be successful in higher education. Social networking sites, such as Facebook and MySpace, and text messages have developed their own style of language. Many students have become accustomed to using this language and often insert it within their coursework. They do not use proper formatting, grammar and mechanics, and formal communication skills required by instructors [7]. Ratliff found students surrounded by technology are not prepared for the distance learning experience. Some abilities needed to enter an online education course are:

- Attaching documents to email.
- Participating in formal discussion boards.
- Internet research.
- Journaling thoughts on assignments.
- Uploading documents to share with fellow students.
- Ethical behavior on plagiarism and assessments.

In 2003, Colorado State University surveyed incoming freshmen about their technology skills [8]. It was determined that 98% of students had an email account but only 81% could attach a file (p.37). Ratliff et al conducted a study of a rural community college’s incoming freshmen. The 182 students were given a technology readiness assessment with the average score being 77% (p. 4). This assessment included questions of basic computer usage such as saving, typing, uploading, downloading, etc. With this in mind it would seem colleges would need some type of technology assessment to ensure student success [7]. Colleges would also need to offer some type of remedial computer courses or tutoring specifically aimed at this deficiency to create enhanced student engagement and success in online courses.

Meissonier and Houze [9] indicate more motivation is needed for online learning than traditional classroom learning. All classes require discipline to complete assignments and students who are not prepared for this type of learning may struggle with motivational factors. While distance education requires the responsibility to fall on the student, this can be an asset because students will then strive for proficiency and become more engaged in the learning because they become vested in their own learning.

If a student does not have the necessary skills for a course, it could put jeopardize and hinder their success in postsecondary education [1]). Students, whether incoming freshmen or adult non-traditional learners, can suffer serious setbacks in learning environments due to lack of computer
literacy and would certainly benefit from some type of entry level course prior to online courses or student services tutoring to give them the skills they need to be successful in their academic endeavors [2].

2 SOLUTION PROCESS AND CONSTRAINTS

As mentioned previously, several regional focus groups consisting of major employers from New Bern, Greenville, and Wilmington, North Carolina [2] disclosed that students needed more training with MS Office productivity tools including advanced spreadsheets and database software (i.e., MS Excel and Access). As with many other institutions [10], research of basic computer competencies at the undergraduate level as well as a perceived/real deficiency in basic computing technology skills and business applications resulted in the adoption of a computer competencies course (CIS 110 – Introduction to Computers) into the GER (General Education Requirements). Moreover, all students must take and successfully pass courses within the GER. MOC (Mount Olive College) has two computer classrooms with 24 stations in each classroom and a finite number of CIS faculty. In response to these resource constraints (i.e., providing additional computer classrooms, and adding additional sections and the associated cost and recruiting of professors), an in-house System Development Life Cycle approach was undertaken to mitigate the constraints; thus, under the leadership of the CIS Department Chair, a self-paced, content-rich, online tutorial was created leveraging the embedded “Help” wizards of MS Office 2010. Because of the tutorial’s design, the tutorial is expected to assist or even enhance student learning outcomes. Students’ progress through the tutorial at their own pace while acquiring desired learning outcomes which required less instructor interaction. MOC attempted to apply an innovative approach to fulfill its computer competencies commitments to students and its accrediting bodies (i.e., ACBSP (Association of Collegiate Business Schools and Programs) and SACS (Southern Association of Colleges and Schools). In addition, the tutorial addresses the problem of increased attrition in online classes by promoting a learning environment that engages students via the use of technology. This can ultimately lead to higher rates of course completion.

2.1 Process Description

The concept of creating a self-pace tutorial which was focused on students’ acquisition Office skills, was first vetted with the CIS Department and the Tillman School of Business Dean back in January 2010. The CIS Department was in full agreement with the pedagogy in using an online self-paced tutorial that offered students many benefits while minimizing risk (i.e., significant number of students not accomplishing designated learning outcomes). In addition, other major stakeholders including the Vice President of Academic Affairs and the Dean from the School of Arts and Sciences were involved early in the process. Furthermore the expertise of the researcher (e.g., prior development of technology learning tutorials, possessing an Education Specialist terminal degree, specialized work in a PhD program (Computing Technology in Education) which involved adult online learning environments, and professional certification in MS Office) helped to ensure the success of the previous online, self-paced, MS Office 2007 tutorial project. However, the tutorial needed to be modernized for MS Office 2010 and to accommodate a specific module on mobile computing.

A customized case study utilizing the System Development Life Cycle (SDLC) was integrated into a CIS 495 capstone class. The foundation of the tutorial would be constructed by senior CIS students with the instructor – who is professionally certified in MS Office - acting as the quasi project manager and course facilitator. The project consisted of three teams- two teams working on separate projects and an Information/Technology (IT) team that fulfilled a support function and it acted as a liaison between the project managers and the instructor. In addition, IT team was charged with securing the domain registration, assuring technical functionality, usability testing, and beta testing the website tutorial. Fig. 1 illustrates the work-flow and reporting responsibilities of the IT team and project managers.
Students were instructed to pay particular attention to the following criteria:

- Learning objectives must be consistent with workforce development for computer literacy.
- The tutorial must be web-based and students may choose the website name along with the hosting service to support the website.
- A holistic approach combining pedagogy and employing superior web usability heuristics is central to the project. The web-based tutorial must be intuitive, easy to navigate with standardized modules.
- Specific knowledge domains are already established which include: Computer Basics, MS Word, MS Excel, MS PowerPoint, MS Access. In addition, a new module was added on mobile computing.
- For ease of web maintenance and updating, each domain must be a stand-alone module; organization of the separate modules is depicted in Fig. 2.

Business applications modules (e.g., Word, Excel, PowerPoint, and Access) were based upon Microsoft Office 2010 Professional Edition. Within each business application knowledge domain, CIS 495 students were instructed to link to and use video tutorials from within targeted applications (e.g., Word, Excel, PPT, and Access) and to the web. The pedagogy relies in part on students searching for specific tasks from within a particular application and then selecting and viewing videos on how to accomplish a specific task. Students grow accustomed to solving a particular task at hand by utilizing the help feature from within the specific application module. This learning strategy places less reliance on an instructor and this type of problem solving approach is expected to carry over to other learning
situations including into other disciplines. All students, professors, staff, administrators and the public at large will have access to the tutorial. When students enter the tutorial, they see a simplistic home page (Fig. 3).

No scrolling is evident on the homepage, and after students select the appropriate tutorial (Microsoft Office 2010), all business application modules appear on the left side of the webpage. Thus, the tutorial is intuitive and it conforms to the principles of web usability. The “Word” module is a typical module which uses a consistent theme. Because of the wide range of browser settings (e.g., Internet Explorer, FireFox, Chrome, etc.), the tutorial did not contain flash or other any other plug-in that would evoke browser warnings or errors. Fig. 4 depicts a typical module (e.g., Excel module).

2.2 Potential Constraints

All students are required to have Internet access; they are mandated by administration to have Internet access because of email accounts and online course supplements (i.e. Moodle course shells). MOC computer labs have broadband access at all locations (i.e., Raleigh, New Bern, Mount Olive, Wilmington, and Jacksonville). In addition, MOC has military students at Seymour Johnson Air Force Base who often get deployed around the world. All students are required to have access to MS Office 2010. This is mandated by the need to ensure a common learning platform for the entire class. Attempting to accommodate earlier versions of MS Office (2007, 2000, XP, etc.) would impose a considerable burden on class administration. Furthermore, all new PC (Personal Computer) systems
are being deployed with MS Office 2010. In addition, the need to “update” the tutorial for future and new versions of MS Office 2010, Office 360, and other web-based business applications, may require substantial changes to the tutorial. Moreover, because the tutorial serves as an aggregator for other non-copyrighted web-based tutorials, maintenance of external hyperlinks is crucial to a favorable user experience. Browser compatibility with any web-based tutorial can be problematic because of frequent browser updating and the expansion of new mobile operating systems (e.g., Android Jellybean, iOS6, etc.). Currently, the tutorial is compatible with all major browsers. Fig. 5 [11] displays the market share for the major browsers.

![Figure 5: December 2012 market share of major browsers](image)

3 METHODOLOGY

Upon completion of the computer applications courses at MOC and Triton Community College, course participants were asked to complete a 21 question multiple-choice survey. A seven-type Likert item was used and response options ranged from strongly disagree to strongly agree (i.e., strongly disagree, disagree, mildly disagree, mildly agree, agree, strongly agree, NA). Several classes and multiple sections were chosen for the data collection phase of the research; and, the survey was opened for data collection for a period of three weeks. Students were solicited via an email invitation to take part in the online survey. Survey Monkey was used to collect the survey data and the data was analyzed using IBM SPSS statistical software. Within the study period, 62 students responded to the survey.

4 RESULTS

Andersson, Reimers’ and Maxwell’s study found that secondary students who used the MS Office 2010 online tutorial had high levels of perceived proficiencies. Some important factors concerning the analysis include that 55% of participants reported using the tutorial 2x or less and 16% reported never using the tutorial. As a result, those 16% who reported never using the tutorial were excluded from the below data analysis. Of those who used the tutorial, the majority (63%) used it 1-5 times. When using the tutorial, the majority of participants (53.4%) used it on average 15-45 minutes per session. Some participants, however, reported using the tutorial on average 46-90 minutes per session (24%) while others reported using the tutorial less than 15 minutes per session (11.5%). 98% of participants reported at least mild agreement with the statement, "I found the MS Office 2010 tutorial easy to use" and the majority of participants (94.2%) reported at least mild agreement with the statement, "The MS Office 2010 tutorial helped me to gain a better understanding of the MS applications covered in this course." Only 1.9% disagreed that the "MS Office 2010 tutorial helped me to gain a better understanding of the MS applications." While 88.5% at least mildly agreed with the statement "The MS 2010 Office tutorial helped me to complete assignments for this course", again, only 1.9% disagreed with this statement. Most importantly, Fig. 6 displays students’ overall perception of the MS Office 2010 tutorial with over 97% of students reporting a favorable perception of the tutorial.
For the MS Word module, 88.1% of participants reported at least mild agreement with the statement, "Using the MS Office 2010 tutorial increased my proficiency with MS Word" (1.9% mildly disagreed), and 96.1% of participants found the MS Word section of the tutorial to be helpful (0% disagreed) (Fig. 7).

For the MS Excel section of the tutorial, 96.1% of participants reported at least mild agreement with the statement, "Using the MS Office 2010 tutorial increased my proficiency with MS Excel", and 98% of participants found the MS Excel section of the tutorial to be helpful; and, 0% disagreed with both statements (Fig. 8).
Fig. 9 illustrates the MS PowerPoint section of the tutorial. At least 90% of participants reported at least mild agreement with the statement, "Using the MS Office 2010 tutorial increased my proficiency with MS PowerPoint; and, 94.1% of participants found the MS PowerPoint section of the tutorial to be helpful; and, 0% disagreed with both statements.

Fig. 9: Student perception of increased proficiency after using the MS Office 2010 PowerPoint tutorial.

For the MS Access module, 75.1% of participants reported at least mild agreement with the statement, "Using the MS Office 2010 tutorial increased my proficiency with MS Access", (1.9% disagreed), and 80.4% of participants found the MS Access section of the tutorial to be helpful (0% disagreed). It should be noted that approximately 20% of participants responded N/A to both questions, however, of the participants who used the MS Access section of the tutorial 100% found it to be helpful (Fig 10).

Fig. 10: Student perception of increased proficiency after using the MS Office 2010 Access tutorial.

With respect to mobile computing, 82.7% of participants reported at least mild agreement with the statement, "Using the MS Office 2010 tutorial increased my proficiency with mobile computing", (1.9% disagreed), and 89.8% of participants found the mobile computing section of the tutorial to be helpful (0% disagreed). Approximately 10% of participants responded N/A to the preceding questions.

5 CONCLUSION

The majority of respondents found the MS Office 2010 tutorial to be helpful (97.9%) and would recommend using the MS Office 2010 tutorial in future sections of the class (95.7%). As noted previously, student engagement in the learning process is a key indicator of quality. Engagement quality is one that contributes to enriching learning experiences for students that positively affect their growth and development [12].
REFERENCES


