PROCTORED VS. UN-PROCTORED EXAMS IN A HYBRID COURSE: A BRIEF COMPARISON OF STUDENT RESULTS

By

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ABSTRACT

The research aims to examine whether there is a difference in undergraduate student performance on skill-based exams in an introductory computer literacy course at a state comprehensive university when exams are administered in-class vs. online. Two samples, each consisting of approximately 107 students, are considered for this study. A comparison of exam scores will be used to identify differences in exam performance between the two groups.

INTRODUCTION

At increasing rates, institutions of higher education are using technology in the presentation of course content. The availability and popularity of online learning is growing. The number of institutions offering Web-based courses are increasing. In the United States, 56% of colleges and universities are offering online courses (Liu, 2005). As universities move towards the development of online/distance courses, they are faced with a number of challenges. One of these challenges is how to adequately assess student learning in an online environment.

The transition of a traditional course to an online or hybrid course requires faculty to evaluate their assessment strategies. As with assessment in traditional courses, the development of an assessment portfolio within a course should be linked to the school's mission, degree specific learning goals, and course specific learning goals. Instructors need to match appropriate assessment techniques (e.g., homework, case projects, exams, presentations, participation, etc.) with the specific objectives of each course. There is also some attention given in the literature on effective techniques to assess student learning in an online environment (Bryant, S.M., Kahle, J.B., and Schafer, B.A., 2005; Gaytan, 2005; Robles and Braathen, 2002).

The most commonly reported challenge in online assessment is how to maintain academic integrity (which is a challenge in traditional courses as well); specifically, how do we catch cheating, verify the identity of the student, and curtail plagiarism (Byrd and Lott, 2003; Scanlon, 2003). Scanlon (2003) further asserts that no existing technology can ensure academic honesty. Commonly the literature "encourages faculty to hold examinations on campus thereby ensuring a higher degree of academic honesty" (Gaytan 2005; Alexander, Truell, and Bartlett, 2002). The assumption is that online testing will increase academic dishonesty and therefore result in inflated student performance.

Most of the works discussing performance in online courses focus on comparing student learning in an online course with a traditional course (Anstine, J. and Skidmore, M., 2005; Liu, Y., 2006). Other works focus on the impact of learning styles in students' preference for various pedagogical techniques used in distance or hybrid based courses (Becker, K., Kehoe, J., and Tennent, B., 2007).

Clearly, faculty are concerned with maintaining academic integrity in their classes. Overcoming the concern that students will commit more acts of academic dishonesty in online/distances courses is critical to obtain. This research offers insight into quantifying the impact of varying exam environment on student performance and on students attitudes/perceptions towards the course.

Hybrid Course versus Traditional Course Description

The course under discussion is INFO273, Introduction to the Computer in Business, an essential computer literacy course allotted for all undergraduate business majors within the syllabi. This course focuses on teaching computer literacy in the Microsoft Office products, Word, PowerPoint, Excel, and Access 2003. Assessment in the

course has three main components - homework, case studies, and examinations. The focus in course assessments is twofold to assess students' competency with basic computer literacy as well as their ability to apply computer skills to solve "real-world" problems in business environment.

Prior to describing the hybrid course model studied, it is useful to describe the traditional Computers in Business Course. The traditional course is delivered in an instructional computer lab and is a hands-on course. Course sections are limited to 30 students; each student is assigned a computer in the lab. Instructors teach students through a combination of computer demonstrations, in-class exercises, hands-on homework assignments and case studies. Exams are administered through online testing software, SAM2003, a product from Course Technology.

Course content does not differ from the traditional to the hybrid course. Course sections in the hybrid course are limited to 120 students; students in each section are assigned to two class meeting times: (1) a common session (1.5 hrs/week) where all 120 students meet in a large lecture - room and (2) a breakout session (1.5 hrs/week) where groups of 30 students meet in a hands-on computer lab. The common session is used for four mandatory lectures throughout the semester that provide an introduction to various topics within the course. The breakout session is used for the instructor and graduate assistants to provide one-on-one assistance to students completing coursework. In the hybrid course, the primary method of instruction is through the use of online course tutorials in SAM2003. The material in SAM2003 is divided into modules that correspond to chapters in the course textbooks. A suggested pace for completing the online training modules is provided to students through the course syllabus, and online through the course management system.

Milestones in the form of homework assignments are provided to assist students to keep pace in the course; students submit homework assignments through SAM Prograder, a product from Course Technology. Student homework assignments are automatically graded by computer through the SAM Prograder program; based upon student performance reports, students can revise and resubmit homework assignments through the system multiple times to improve their grade and understanding of course material. In addition to homework assignments, students are required to complete a hands-on exams using SAM2003 and a case study where students apply their computer skills to solve "real-world" business problems for each section of the course.

Research Scope and Hypothesis

This paper, examines whether there is a difference in undergraduate student performance on skills-based exams in an introductory computer literacy course at a state, comprehensive university when exams are administered in-class vs. online. The study also challenged the hypothesis that student exam performance will be different in the group, who take their exams online. The hypothesis examined in this research is as follows:

Hypothesis 1:Students taking their exams online will achieve the same level of performance as students taking their exams in-class.

In addition, student perceptions of the hybrid computer course are gathered through participant observations, course evaluation surveys, and informal interviews.

Data Collection

Subjects for this research are, students enrolled in two sections of an introductory computer literacy course at a state university. Both sections of the course are taught by the same professor and when choosing their section of the course, students were not aware that there were any differences in assessment methods in the two sections.

Each section of the course had enrolled with approximately 107 students. Sections meet at similar times during the day. Additionally, both sections are identical in form, curriculum, and types of assessment (i.e., homework, projects, and exams). The only difference in the two sections is that Section 1 took all three exams in a proctored computer lab while section 2 took their three exams without monitoring. Students in both sections are required to take each exam during the same one week

period of time.

Data for this project was gathered through:

- Recording student perceptions of the hybrid computer course through participant observations, course evaluation surveys, and informal interviews
- Analyzing student performance by section through three sets of graded hands-on exams.

Hands-on Exams

Topics and Testing Environment

All exams in the course are administered in a hands-on computer environment. Exams are skills-based and delivered using a publisher developed Computer Based Test (CBT); during the period of study SAM2003 was used, which is developed by Thompson Course Technology.

Three exams are administered during the course of the semester; one for each module in the course: Word/PowerPoint, Excel, and Access. Each hands-on exam is comprised of 30-40 questions; students are allotted a 60 minute window of time to complete each exam. All questions require students to complete a skills-based task in Word, PowerPoint, Excel, or Access. Example questions include:

- Insert a footnote at the end of the third paragraph with the text "The name of the course is INFO273".
- Apply the "Concourse" design theme to all slides in the presentation.
- Insert a formula in cell B10 that calculates the product of cells B8 and B9.
- Create a select query that returns to the title and publisher of all books written by authors with the last name Mitchell

While taking each exam students are allowed two attempts to answer each question correctly. If a student performs the required skill correctly the first time they are automatically advanced to the next question; if a student performs an incorrect action, the question is reset and the student can take their second attempt. Upon answering each question, students know the outcome whether it is correct or incorrect. Throughout the exam, students have the option of skipping questions and attempting them later in the exam. The CBT allows students to perform tasks in multiple ways (i.e., using shortcut keys, using menus, or using the mouse). A sample screen shot of a skills-based question can be viewed in Figure 1.

Students are automatically graded by the CBT. At the completion of the exam (when either all questions are answered or the allotted time has expired), students are provided a detailed performance report with both their overall score and question specific details, including a log of all key strokes made for each question.

Data Analysis - Student Performance

To test our research hypothesis, a one-way ANOVA was performed on results from the online section and the in-class section for each of the three exams as well as the average of each student's three exam scores. Table 1 presents the results of each of the four ANOVAs.

Results, based on each of the three exams as well as the average of three exams indicate that the hypothesis cannot be rejected at the $\alpha=0.05$ level of significance. As seen in the results presented in Table 1, the p values range from .1720 to .8349, all indicating that null hypothesis could not be rejected. The ANOVA results show that there is no significant difference in student

Exam	P-Value
Word	.6840
Excel	.8349
Access	.1720
Exam Average	.4050

Table 1. ANOVA Results

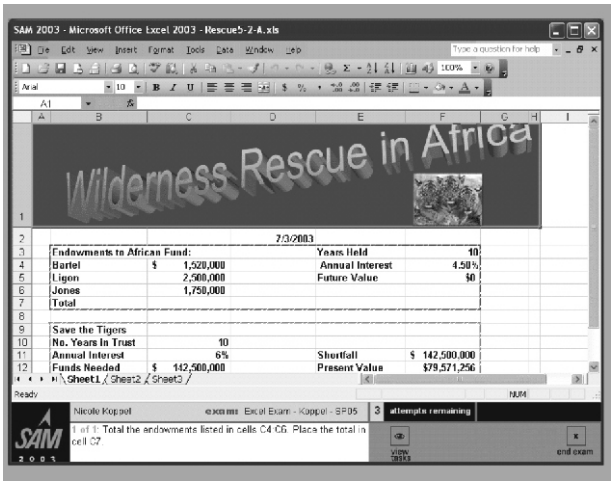

Figure 1. A skill-based exam question from SAM2003

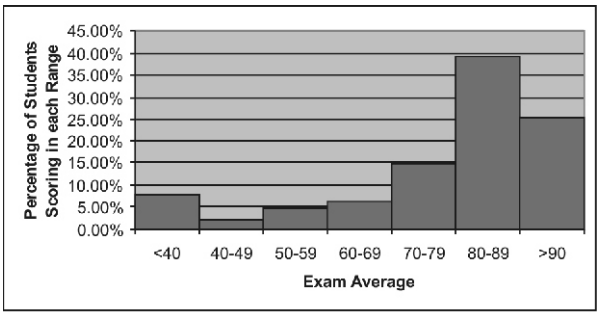

Figure 2. Histogram of Exam Averages for Students in the INFO273 Course

exam performance between the section that took the exams in-class in a proctored environment or the section that took the exams in an un-proctored setting.

To examine the academic performance of students in the computer applications course, the average of each student's average exam score (based on three exams) was calculated. Exams evaluated the proficiency in Microsoft Word, PowerPoint, Excel, and Access. All exams were scored on a one-hundred point scale. The grade distribution and analysis is presented in Figure 2.

As Figure 2 displays, overall students performed well in the course. Sixty-five percent of students' average exam scores are above 80. Ten percent of students have exam averages in the failing range of below 50.

Data Analysis - Student Perceptions

Specially designed course evaluation surveys were used to gather information, concerning students' experiences in the hybrid computer course. 154 of the 214 students enrolled in the course have completed the online course evaluation survey.

All data collected was prepared for analysis with Excel 2003 and SPSS14. Five statements were administered to examine student attitudes and perceptions toward the hybrid computer class. The summaries that follow are based upon entire student responses. Students were given a statement and asked if they 'strongly agree, agree, uncertain, disagree', or strongly disagree with the given statement. It is noted that none of the students submitted a 'strongly disagree' response to any of the survey questions.

The first statement evaluated students' opinions regarding the professors' accessibility.

Statement 1: The professor is easily accessible and encourages students to seek his/her help outside of class: Students evaluated the accessibility of their hybrid course professor. As shown in Figure 3, the majority of students (79.7%) agreed or strongly agreed with the statement that their professor was easily accessible and encouraged students to seek his/her help outside of class despite the fact that there were only four required class meetings.

The second and third statements evaluated the online course content system including the tutorials and the practice tests.

Statement 2: Regarding the SAM 2003 Online Tutorials - they were useful in learning Microsoft Office Skills for the course: Students overwhelmingly found the online course content system to be effective. As shown in Figure 4, a total of seventy-eight percent (78%) of the students strongly agreed or agreed with the statement.

Statement 3: The practice tests in SAM 2003; the online content system; were helpful in preparing for in-class exams: The majority of the students felt that evaluating

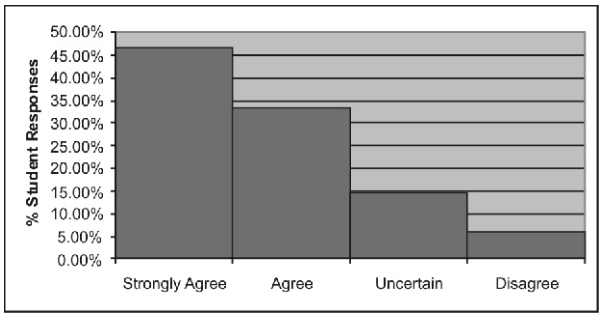

Figure 3. Student Responses to Statement 1: The Professor is easily accessible and encourages students to seek his/her help outside of class

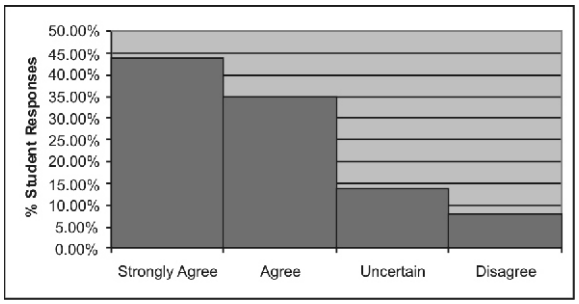

Figure 4. Student Responses to Statement 2: Regarding the SAM 2003 Online Tutorials - they were useful in learning Microsoft Office Skills for the course

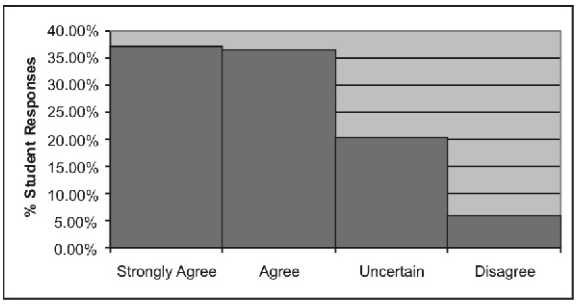

Figure 5. Student Responses to Statement 3: The practice tests in SAM 2003; the online content system; were helpful in preparing for in-class exams.

their progress with practice tests was helpful for studying for in-class exams. As shown in Figure 5, seventy-four percent (74%) of the students strongly agreed or agreed with the statement. Only six percent (6%) disagreed with the statement.

The fourth statement evaluated the students' opinions on the appropriateness of the hybrid format for the computers in business course.

Statement 4: Regarding the Hybrid format of the course - the self-paced format of the course was appropriate for this course: Based on the response to this statement, students appeared to have a positive experience with the hybrid format of the course. As shown in Figure 6, ninety-five percent (95%) of the students strongly agreed or agreed that they would consider taking another course utilizing the online course content. Only five percent (5%) disagreed with the statement.

The last statement evaluated students' inclination to take another hybrid course.

Statement 5: I would consider another course that is offered in a hybrid course format: The majority of the students reported that they would consider taking another hybrid course. As shown in Figure 7, eighty-five percent (85%) of the students agreed with the statement. Only five percent (5%) disagreed with the statement.

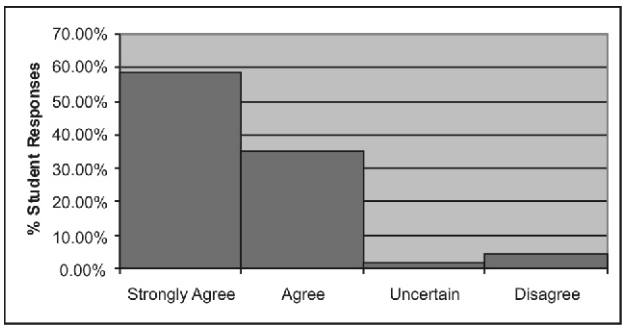

Figure 6. Student Responses to Statement 4: Regarding the Hybrid format of the course - the self-paced format of the course was appropriate for this course.

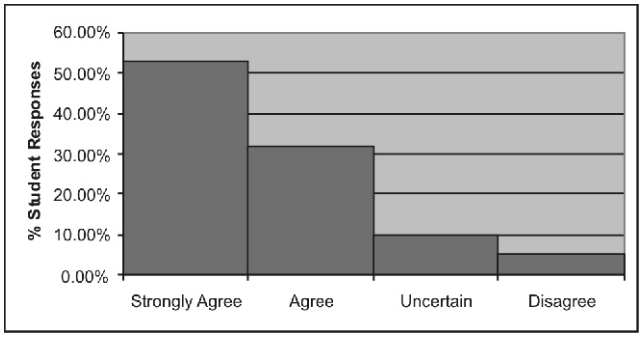

Figure 7. Student Responses to Statement 5: I would consider another course that is offered in a hybrid course format

Conclusion

Assessment in online courses is a large issue. Many instructors are reluctant to teach in this environment because they are concerned about who is actually doing the work. The assumption is that online assessment will result in cheating.

The results clearly indicate that in the exams administered as part of the introduction to computers course, there is no difference in student performance when exams are administered in a proctored vs. un-proctored environment. It can be assumed with the results that on these particular exams cheating did not result in a disparity in performance between the two sections.

A possible contributing factor to a non-detectable amount of cheating could be the format of the exams administered in this course. All course exams are delivered through a hands-on simulated office testing environment. All exam questions require students to perform tasks in a simulated Microsoft Office environment. The type of test is not conducive to encouraging cheating behavior.

As a follow-up, the impact of assessment form has on cheating behavior of students is also planned to be examined.

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