

ENSURING ACADEMIC INTEGRITY IN ONLINE COURSES A Case Analysis in Three Testing Environments

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The purpose of this study was to determine which remote testing systems, all designed to ensure academic integrity, offer a realistic and secure approach to online examinations and best fulfill the needs for faculty and students. This study explored the use of 3 testing tools to determine whether there are differences in test scores and student grades in the distinct testing environments. They are: nonproctored recorded online testing environment (Respondus Monitor), nonproctored lockdown online testing environment (Respondus LockDown Browser) and, nonproctored online testing environment (Blackboard Test and Survey Tool). The data were collected from a Midwest public university.

INTRODUCTION

The issue of student identification and authentication is now an essential area of compliance within federal policy and law. Providers of online education must develop policies and procedures for verifying that the same student who signed up for the course does the work and receives the academic credit. Protecting the integrity of online courses and programs, and satisfying the accrediting agencies respon-

sible for enforcing the law, requires investment of time and resources into the prevention and detection of academic dishonesty.

FEDERAL COMPLIANCE

In August 2008, Congress passed the Higher Education Opportunity Act, reauthorizing the 1965 Higher Education Act, as amended. In a section addressing accreditation and program

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integrity, 34 C.F.R. § 602.17(g), the law states in pertinent part:

[The agency] Requires institutions that offer distance education ... to have processes in place through which the institution establishes that the student who registers in a distance education ... course or program is the same student who participates in and completes the course or program and receives the academic credit.

The statute specifically requires institutions to verify the identity of a student who participates in a class or coursework by using methods such as: secure login and passcode; proctored examinations; and, new or other technologies and practices that are effective in verifying student identity.... 34 C.F.R. § 602.17 (g)(1) (i –iii).

WAYS TO ENSURE ACADEMIC INTEGRITY

Educators in higher education use a variety of methods and tools to ensure academic integrity in online courses. Creating a clear academic dishonesty policy and making them availability to students is the first step (Simonson, Smaldio, Albright, & Zvacek, 2003). Utilizing authentic assessment strategies, such as collaborative projects, and e-portfolios is effective (Bobak, Cassarino, & Finley, 2005). Requiring an outline and a draft for individual written projects prevents students from submitting others' work at the end of a semester. Wikis are a great tool in the implementation of this process. Many software applications like Turnitin and SafeAssign can also detect plagiarism by comparing students' essays to electronic databases.

Proctored examinations are another way to verify student identification. Whether it is pre-packaged, using lockdown browser and recorded video features in the learning management system, or proctored with a human proctor at a distance via video streaming, consideration must be given to convenience,

affordability, minimal hardware requirements and, most importantly, security.

Prince, Fulton, and Garsombke (2009) found significant differences in average test scores between tests taken electronically without a proctor and those administered using a live or a remote proctor. Students scored significantly lower on proctored exams versus nonproctored exams. Cochran, Troboy, and Cole (2010) found that the grades for the remote proctor group trended lower than the nonparticipants. They also found that remote proctor participants felt that the remote proctoring system had no impact on their exam taking abilities.

To meet the need of online education in online testing, many vendors have developed tools to provide proctoring services. This study involved Respondus Monitor, Respondus LockDown Browser, and Blackboard Test Tools available to faculty and students in the university that the study was conducted.

Nonproctored Recorded Online Testing Environment

Respondus Monitor is a companion product for LockDown Browser that enables students to take online exams in nonproctored environments ("Respondus Monitor," 2015). There is no additional software to install, and students use their own computers with a standard webcam to record assessment sessions. Instructors can review the entire session from Blackboard course sites. If used, students enrolled in the course need to pay a flat fee per course per semester. Institutions can also purchase seats and allow students to use it for free.

Nonproctored Lockdown Online Testing Environment

Respondus LockDown browser is a custom browser that locks down the testing environment and can be integrated with the learning management system. When students are required to use the LockDown Browser when taking a test, they are unable to print, copy, go

to another website, or access other applications using the same computer. When a test is started, students are locked into it until they submit it for grading ("LockDown Browser," 2015).

Nonproctored Online Testing Environment

The Blackboard quiz/survey tool allows faculty to create timed tests with random selections pulled from a pool of questions. On the test day students will be able to take the test in the time frame that was set by the faculty. The questions in the test can be different from student to student since they can be randomly selected from the question pool. When time expires, the system will shut down the test.

The Blackboard quiz tool allows faculty to control when the results of the test are released to students, as well as the type of results and feedback that are released. Instructors are encouraged to consult with an instructional designer to discuss options and settings that will meet the goals of individual assessments, and the course as a whole.

ABOUT THE COURSE IN THE STUDY

This course on auditing was a cross-listed, offered to both undergraduate and graduate students, and open to all students at the university. The same faculty member has offered this course online for several semesters. The overall goal of the course was to help prepare students for a professional career either working as an auditor or working with auditors. The course introduced numerous professional topics such as the importance of auditing, management assertions, risk, evidence, and reporting and professional liability. The material covered is tested in a standalone section on the certified public accounting professional exam.

The course included two midterm exams and one comprehensive final exam. The exams

contained true or false and multiple-choice questions, several cases, and a four-part company analysis project. The final exam was weighted. Approximately one half of the points were based on material already tested. The other half was based on two chapters that were not previously tested.

To assure the integrity of the testing process different testing tools were used in the previous semesters. In summer and fall 2014 and spring 2015 semesters, Respondus Monitor was used. In spring 2014 Respondus Lockdown was used. In summer and fall 2013 Blackboard Test tool was used. The settings for all exams were set up the same with randomized questions, displayed one at a time, and backtracking prohibited. The exams opened from Sunday through Wednesday with 80 minutes to complete the final exams and 55 minutes to complete each of the two midterm exams.

DATA COLLECTION AND ANALYSIS

The instructor collected the exam scores and final grades of the same course offered over four semesters with different testing tools used. The instructor also removed identifiable student information before data analysis. Eighty-seven students used Respondus Monitor, 32 students used Respondus LockDown Browser, and 38 students used Blackboard Test Tools. One-way ANOVA was used to determine the grade difference between the three groups. Among the 87 students whose tests were administered in Monitor, 1 student did not take any of the tests; therefore, that data set was dropped from analysis.

RESULTS

Descriptive statistics were calculated on the mean scores of exams administered in three testing environments: nonproctored recorded online testing environment, nonproctored lockdown online testing environment, and nonproctored online testing environment. As

shown in Tables 1–3, there is not much difference in the mean score between three different testing environments. However, the standard deviation scores of the final exam and the total points between the three testing environments are different and it is very large, as there are two students who did not take some of exams when the tests were given in Respondus Monitor.

One-way analysis of variance (ANOVA) was used to determine whether differences existed in the mean score of tests administrated in three testing environments. As shown in Tables 4–7, no statistical differences were

detected across three testing environments in mean scores of the exams.

DISCUSSION AND IMPLICATION

Although there were fewer students with Ds and Fs when exams were administered in Respondus Monitor (4.62%) than in Lock-down Browser (9.12%) and Blackboard Test Tool (5.09%), there was a big difference between the three testing environments on the standard deviation of the final exam (Monitor, 25.42; Lockdown, 15.56; Blackboard, 17.88)

TABLE 1
Mean and Standard Deviation of Exams Administered in Monitor

	<i>N</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Mean</i>	<i>SD</i>
Exam 1	86	50	100	83.49	12.009
Exam 2	86	0	100	84.28	15.459
Final exam	86	0	150	127.37	25.421
Total points	86	70.0	481.0	389.907	71.1879
Valid <i>N</i> (listwise)	86				

TABLE 2
Mean and Standard Deviation of Exams Administered in Lock Down

	<i>N</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Mean</i>	<i>SD</i>
Exam 1	33	42	98	81.94	14.313
Exam 2	33	58	100	83.82	10.409
Final exam	33	86	148	132.18	15.559
Total points	33	336.5	479.5	418.424	41.6126
Valid <i>N</i> (listwise)	33				

TABLE 3
Mean and Standard Deviation of Exams Administered in Blackboard

	<i>N</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Mean</i>	<i>SD</i>
Exam 1	39	58	96	80.56	10.789
Exam 2	39	52	100	84.00	11.211
Final exam	39	84	150	125.18	17.881
Total points	39	269.0	512.0	423.013	56.3328
Valid <i>N</i> (listwise)	39				

TABLE 4
ANOVA Results for Exam 1 by Method of Testing Environments

	<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
Between groups	21.194	23	.921	1.375	.135
Within groups	89.825	134	.670		
Total	111.019	157			

TABLE 5
ANOVA Results for Exam 2 by Method of Testing Environments

	<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
Between groups	23.242	23	1.011	1.543	.067
Within groups	87.777	134	.655		
Total	111.019	157			

TABLE 6
ANOVA Results for Final Exam by Method of Testing Environments

	<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
Between groups	28.449	29	.981	1.521	.059
Within groups	82.570	128	.645		
Total	111.019	157			

TABLE 7
ANOVA Results for Total Points by Method of Testing Environments

	<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
Between groups	84.019	116	.724	1.100	.372
Within groups	27.000	41	.659		
Total	111.019	157			

TABLE 8
Percentages of Letter Grades

<i>Environments/Grades</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D & F</i>
Monitor	34.88	36.04	24.42	4.62
Lockdown	33.33	36.36	21.21	9.09
Blackboard	25.64	33.33	35.90	5.12

and the total scores of the exams (Monitor, 71.19; Lockdown, 41.61; Blackboard, 56.33). The difference might indicate that the technology-based nonproctored testing tool via streaming audio and video, such as Monitor, could be the environment that discriminated the student population in this study.

The result was not statistically significant, but the standard deviations of exams administered in Monitor were bigger than exams administered in the other two environments. It is recommended that a technology-based nonproctored testing tool via streaming audio and video, such as Monitor, be used for high-stake exams if human proctored testing is not feasible to students due to a variety of constraints such as cost, time to travel, and schedule. However, other types of assessments and online testing can be used but need to be carefully designed and implemented in online courses.

The possibility of academic dishonesty can be better handled by proactively assisting our students develop legitimate strategies and providing resources and support throughout their academic journey. When designing student assessments, faculty can consider different types of assessments to evaluate student performance against the stated learning objectives. The assessments can include but are not limited to: online testing, online proctored testing, on-campus testing, remote proctored testing, and authentic assessment.

No matter what type of assessments faculty use, it is imperative to have an open, ongoing dialogue with students about academic dishonesty and the consequences of breaching the policy. Embedded activities regarding academic dishonesty scheduled for the first week

of class, such as a pop quiz or an online discussion, may be an effective way to communicate the policy to your students.

This study was based on a course offered in different semesters with limited numbers of students and was not statistically significant. However, if human proctoring is not a feasible option for students, the findings indicated that technology-based proctored testing tool via streaming audio and video, such as Monitor, may be an effective tool to use to tackle the issues of academic integrity, especially for high-stake tests such as midterm and final exams. Further studies are necessary utilizing larger data sets.

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