Assessing Faculty Perceptions and Techniques to Combat Academic Dishonesty in Online Courses

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Abstract

Online Education is growing as it provides an added convenience to students, especially ones who have life circumstances that prevent them from attending traditional classes. With this growing trend, faculty and universities are facing increased risks with validating student identities in online courses and combatting unethical student behavior. This exploratory study of 75 faculty members will examine faculty perceptions of academic dishonesty specific to validating student identities along with discussing techniques used to combat academic dishonesty. Additionally, it is important to understand how faculty perceptions correlate with demographic characteristics and their experiences in order for administrators and universities to effectively develop techniques to mitigate the risks associated with academic dishonesty in online courses.

Keywords: Distance learning, online learning, academic integrity, student verification

1. INTRODUCTION

Technology surrounds us during each of our waking and sleeping moments. Our nightly visits to the land of Hypnos and Morpheus no longer offer us a reprieve from the ubiquitous grip of electronic technology and the quest to stay perpetually connected to the world. It is no wonder that the instructors in the academic world are frequently challenged with the prospects of student cheating in the online assignment environment. Students and instructors alike are tethered to their electronic devices in our twenty-four-seven world. Most students are tied to their mobile devices for fear of missing a moment of connectivity to the outside world and to those whom they feel compelled to maintain an electronic relationship.

Instructors in academia are no different and also wear the stigmata of an electronic chain.

One of the challenges of teaching and testing in the virtual world of academia is the preservation of the integrity of the online educational environment. As online instructors we often have to come to terms in which we are supposed to "believe" in a student's honesty and integrity. Most, if not all, post-secondary institutions have a code of conduct that the student aggresses to implicitly or in a signed agreement.

As universities have attempted to remain competitive by offering online courses, validating student's identities have become difficult. There is no doubt that distance learning has always seen this challenge and been questioned with validating the identity of distance education students. As a result, universities and colleges should focus on implementing verification methods to establish user identities. This study will assess the validation of student identities, as well as, authentication and academic integrity methods that are set in place for distance learners. The following research questions were explored:

RQ1: Is there a correlation between faculty authentication methods used in online courses with age and gender?

RQ2: Do university faculty adopt techniques to mitigate the risks of unethical behavior in online courses?

2. BACKGROUND

The validation of student's identities has been questioned by those critical of distance learning (Baile & Jorbert, 2008). Do educators really know who has completed the course requirements in online classes is a question of debate. The College of Opportunity and Affordability Act (H.R. 4137) , "requires institutions that offer distance education to have processes through which the institution establishes that the student who registers in a distance education course or program is the same student who participated in and completes the program and receives the academic credit" (Database, 2007). In order to maintain the integrity of online learning, validating the end users identity is a priority (Paullet, et.al, 2014).

According to Howell, Sorensen & Tippets (2010), many distance educators are concerned about the integrity of their courses but few are willing to spend time or resources to continually learn the newest cheating methods and techniques for prevention of them.

A study conducted by Grijalva, Kerkvliet, and Nowell (2002), examined the level of cheating in online courses. The researchers used class cheating and testing policies to examine student responses. The findings revealed that academic dishonesty in a single online class is no more prevalent than in traditional classrooms. Throughout education, students have always come up with excuses as to why their assignments are late. A familiar reason is "the dog ate my homework." In 2015, living in a world surrounded by technology, student excuses have changed. We now hear, "the dog ate my flashdrive," "the Internet connectivity dropped while I was taking an exam," or "my computer has a virus." Technology has provided students with new opportunities for academic dishonesty. Students can now search the Internet while taking an online exam, or use thoughts and references of published authors as their own during an exam or when completing assignments. The ease of cheating and plagiarism in online courses is less visible to their classmates and instructors.

3. DISHONESTY METHODS USED BY ONLINE STUDENTS

Students are now using new methods to cheat online. Krask (2007) provides an example where a student starts an exam so that they are able to view all of the questions. The questions are then printed so that the student has time to search for the answers. After printing the questions, the student then disconnects from the Internet which will cause the exam to lock, which in turn does not permit the student to enter the exam to finish. After searching for answers, the student emails the instructor, often times providing a screen shot of the connection loss from the Internet, and requests for the exam to be reset (Rowe, 2004).

Online students often also use a "waiting" approach. Many online instructors allow a few days to take an exam. Since the timeline is a bit flexible, some students may wait until others have already taken the exam, and then ask for the questions. While online testing software can often restrict the ability to print out questions, students can still take screenshots of the questions or photographs on their mobile phones. In addition, many students fraudulently report error messages while taking online exams. If a student is unprepared, he or she

can start the exam, get a look at the questions, or perhaps even photograph or copy them, and then report to the instructor that they received an Internet/connection error and need to have their exam reset. This gives the student more time to look up answers to the questions while the instructor is resetting the student's exam so that it can be restarted (Moten et al., 2013).

Howell et al. (2010) note that one of the newest methods of cheating involves the use of "braindumps," which are actual online businesses that provide students with studying services and often guarantee passing scores. Some of these sites may even offer access to exam questions and homework solutions directly from the instructor versions of textbooks, as well as access to previously graded essays or assignments. Four of the most well-known braindump sites are Cramster, Koofers, Study Blue and Course Hero which are considered tutoring sites where students can review past exams, assignments and projects used in their current courses. However, braindumps can pop up in a variety of places, or even for very specific schools or courses. One professor from Indiana State University found her test questions for sale on eBay (Howell et al., 2010).

In addition to braindumps, students continue to utilize new technologies to enhance cheating activities. One of the current popular cheating methods is use of mobile phones. Students can keep crib notes on their phones, use text messaging to have a friend lookup answers for exam questions, or take photographs of an exam and transmit them to other students (Howell et al., 2010).

Students are also using online services such as WeTakeYourClass.com or BoostMyGrade.com in which they pay a fee for someone to take their online classes. Prices vary according to the complexity of the class and type of class. For example, a student will pay a higher fee for an advanced biology course than they would for an introduction to computers course. They can also pay for individual assignments or projects to be completed rather than the entire course.

4. PREVENTATIVE MEASURES

Pencil and paper testing are fast becoming antiquated and displaced by the growing trend of testing inside an online environment. One of the first concerns in accessing any website is the security of the site and user verification. User names and passwords are used as a security verification process for accessing accounts online. Even though technology can provide students opportunities for academic dishonesty, it can also provide ways to monitor and control these opportunities (McGree, 2010). When designing an exam, instructors have the ability to use a lockdown browser. A lockdown browser, such as Respondus, will not allow students to search the Internet during the exam from the computer that they are using. This method can help eliminate cheating by making the students aware that searching for answers while taking the exam is unacceptable. The reality is that the lockdown browser can become inefficient very quick since many students use and own multiple devices such as a Smartphone or tablet which would enable them to search elsewhere.

Educators with distance learning students are confronted with a crucial issue, determining the identity of the participant. This moves to the "front and center' of the classroom experience during testing and determining the originator of written exams. Moreover, determining user identity in the virtual classroom is also linked to user progress and student aid eligibility. Student aid eligibility; of course, is linked to students meeting the minimum institutional academic requirements. To help validate student identities, keystroke dynamics are beginning to be used. Keystroke dynamics is a process that scrutinizes a user's typing style at their terminal keyboard by monitoring "keyboard inputs thousands of times per second in an attempt to identify users based on habitual typing rhythm patterns (Monrose and Rubin, 2000). "Keystroke dynamics is not what you type, but how you type" (Monrose and Ruben, 2000). Existing evidence demonstrates the reliability of keystroke rhythm to accurately determine user identity. Keystroke dynamics is inexpensive versus other biometric systems. A keyboard is the only necessary hardware that is used (Monrose and Rubin, 2000).

One way to mitigate cheating in online courses is to use a variety of assessment techniques rather than using only high stakes exams. If instructors rely on a combination of interactive discussions, writing assignments, quizzes, and projects as well as online exams, it makes it more difficult for students to cheat (Hill, 2010). Incorporating more written assignments and interaction written discussions can also help to reduce cheating. Instructors can become familiar with their students' writing styles, giving them greater confidence in recognizing possible

fraudulent behavior. Plagiarism detection software can also be used on all written content as well, so the instructor has an additional method of testing authenticity of written work (Hill, 2010).

Institutions can combat cheating in a variety of ways. One method of preventing cheating is to use an "honor system" and create a culture of academic integrity within your institution. Many institutions that use an honor system require students to sign a "Pledge" either once a semester or sometimes on each examination taken, reaffirming that they are aware of the honor code and agree to abide by it. During exams, many institutions now ban all electronic devices. In addition, identification, including a photo ID or biometric scan is often now required for students taking examinations at some institutions. Pennsylvania State University's World Campus is also now testing a new online security system called WebAssessor. WebAssessor uses proctors and web cams to ensure that students match their photo IDs and allows proctors to view a student's face, keyboard, and workspace remotely. In addition, WebAssessor uses software that recognizes students' typing styles, for example, their speed of typing and whether or not they pause between typing specific letters. If the proctor sees anything suspicious, he or she can stop the student's exam immediately (Howell et al., 2010).

Some institutions require students to take exams on special "cheat-resistant" laptops. These laptops employ additional security measure and often only have software installed to display the exam. This approach has been used in Norway and also at the University of Central Florida (Howell et al., 2010).

Cabrera (2013) offers several suggestions reducing the temptation and likelihood for in "learning assessment activities, namely testing and homework activities." Tips for testing include: Purposefully select assessment methods, use question pools, randomize questions limit feedback, set timer, display questions one at a time He bases this assessment on findings from D. R. Krathwohl 2001 revision of Bloom's taxonomy. "Although it may be difficult to prevent entirely, faculty can implement steps to reduce its impact in the student learning assessment process for online courses" (Cabrera, 2013, p.1).

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In determining the assessment method, consideration should be given to the learning outcome sought for the student and the goals and objectives of the course. For low stake objective assessment it is suggested that purposely selected online testing questions include multiple choice, true/false, or multiple answer. Since the purpose of objective testing is to determine a student's ability to recall and organize information, other procedures can be used when accessing a student's critical thinking skills. This would include methods to determine the student's ability understand, apply, analyze, evaluate and create accurate responses to test questions (Cabrera, 2013)

Jortberg (2010) surveyed students at Sullivan University in Louisville and found that, given a choice, students would prefer to answer challenge questions in order to verify their identity before an exam rather than other identification methods such as mandatory use of a web cam, biometric scanners, signature recognition programs, or having to come to campus to take exams.

Cabrera (2013) suggests following guidelines from (Watson and Sottile, 2010). This method involves the mix of objective and subjective questions. Objective measurement of understanding would involve the use of multiple choice questions, multiple answers, fill in the blank, and true /false responses. Conversely, a subjective approach would entail the use of short answers or essay questions. This subjective approach requires a greater understanding of the material. Obviously, the mixing of question types does not guarantee test questions and answers will not be shared, it could correlate in some respect to the final grade.

A tip suggested by Cabrera (2013) is to use question pools. Question pools are best used when there are a large amount of possible questions in selective categories such as true/false, multiple choice, and fill in the blank.

The test administrator selects an appropriate amount of time for each question category which can vary from class to class or semester to semester. New questions can be added or old ones deleted at the inclination of the faculty member.

An option for faculty is to randomize questions. This is one of the test options available in many online learning management systems. This choice is effective since students who are administered the test at the same time are unlikely to have similar questions presented in the same sequential order. In this way, students who take the testy at the same time cannot share answers. When an option to repeat the test is permitted, this randomization provides additional security against cheating (Cabrera, 2013).

Limiting Feedback is another option in the online testing environment. Test options available in online learning management systems include, test Score, Submitted Answers, Correct Answers, and Feedback. Obviously feedback in the form of test scores must be made available to the student. If correct answers are provided or the answers submitted are marked incorrect, students' by the process of elimination can determine the correct answers and share them with others or save them for test retaking opportunities (Cabrera, 2013).Another option would be to Set a Timer. When time is used unprepared students have more to lose as looking through an open book or notes for an answer consumes valuable time. (Cabrera, 2013).

5. METHODOLOGY

This study examined faculty at two small mid-Atlantic Universities during the period of March to May 2015. The research utilized a quantitative methodology to assess faculty's implementation of authentication methods used in online courses and their experiences with ethical student behavior. The population chosen for this study was comprised of 451 faculty members at both universities. A total of 75 respondents completed the survey. The survey was conducted using Survey Monkey, an online tool, to gather and organize data. The data was imported into SPSS for further analysis. The researchers used Chi-square with a statistical significance at the .05 margin of error with a 95% confidence level. The study was a convenience sample surveying faculty from all departments within the universities which

included the School of Arts and Humanities, Business, Science and Math, Engineering, Computer Science, Information Technology, Criminal Justice and Psychology. The study explores the following two research questions:

RQ1: Is there a correlation between faculty authentication methods used in online courses with age and gender?

RQ2: Do university faculty adopt techniques to mitigate the risks of unethical behavior in online courses?

The survey instrument consisted of 15 closed-ended and two open ended questions for further understanding of participant responses and feedback about unethical student behavior in online classes. The first three questions focused on faculty demographics; which included gender, age, and associated department. Questions 4 and 5 asked if the faculty members have taught online and if so, how many classes they have taught. The majority of the remaining questions aimed to ask what authentication methods the faculty used in their online courses for student identities and their experiences with students' ethical behavior. The two open-ended questions looked to understand if there were other methods that the faculty members used for validating student identities in online courses and any additional comments they may have about the topic.

6. RESULTS

Table 1: Breakdown of Participants by Age

Age Range	% of Respondents
25-30	1.35%
31-35	5.41%
36-40	25.68%
41-45	10.81%
46-50	9.46%
51-55	16.22%
56-60	16.22%
61-65	5.41%
66-70	8.11%
71-75	1.35%

The survey responses were analyzed at both universities where faculty members ranged in age from 29 years old to 72 years old. The greatest number of participants occurred in the age group of 36-40 year old representing

25.68% of the respondents with the next largest occurring between 51-55 and 56-60 years old representing 16.22% of the respondents each. The results can be seen in table 1 below. Similarly the study found that 44% of the respondents were male while 56% were female.

In order to qualify for the survey, faculty members had to teach at least one online or hybrid class. Eighty-eight percent of the 75 respondents stated they had taught online, while 12% stated they have not taught online. The respondents who stated they have taught online were asked to complete the remaining survey questions while the respondents who hadn't taught online were thanked for their participation. Participants who continued on with the survey were asked to specify how many online classes they had taught before. Approximately 83.6% of the respondents had taught less than 30 online classes with 40.98% of the total teaching less than 10 online classes. A breakdown of these results can be found in Table 2 below.

Table 2: Number of Online Classes Taught

Number of Classes Taught Online	% of Respondents
0-9	40.98%
10-19	24.59%
20-29	18.03%
30-39	6.56%
40-49	1.64%
50-59	3.28%
60-69	0.00%
70-79	1.64%
80-89	0.00%
90+	3.28%

The survey identified six methods that faculty could use to authenticate student identities in online courses. These methods were:
- Have students take the exam at a regional testing center or library (proctored exams)
- Used webcam proctors
- Used keystroke recognition devices
- Used independent coursework instead of multiple choice or true/false exams
- Utilized Respondus lockdown browser
- Utilized Turnitin for assignments, projects and papers

Each participant was permitted to select as many answers that applied to their teaching methods. The most utilized methods included using Turnitin for assignments and independent coursework at 52.31% and 44.62 %, respectively. None of the participants said they used keystroke recognition devices. These results can be reviewed in Table 3 below.

Table 3: Student Identity Authentication Methods

Method Used	% of Respondents
Proctored Exam	6.15%
Webcam Proctor	3.08%
Keystroke Recognition Devices	0.00%
Independent Coursework	44.62%
Respondus Lockdown	21.54%
Turnitin	52.31%

The researchers wanted to understand if any of the six authentication methods were statistically significant when compared with either Gender or Age. Proctored Exams were the only authentication method that was statistically significant with gender. Additionally, using Turnitin was slightly outside of this range with a chi-square value of .064. Age was statistically significant with Proctored Exams, while none of the other methods had a chi-square value within the acceptance criteria. It is important to note that using keystroke recognition devices did not have any responses and therefore are blank in the table below. A full breakdown of these results can be seen in Table 4 in the appendix.

The researchers wanted to better understand what faculty members do to prevent online cheating and what their level of awareness was in relation to websites that aide students with unethical behavior in online courses. The results of these questions are found in Tables 5 and 6 in the appendix and correlate to the following questions:
- Require students to sign an academic integrity policy for their online class.
- Aware of online services where students pay someone to take online courses for them.
- Give the same Exam each semester for online classes.
- Checked online sites where students past copies of online exams.

- Require students to read the university's code of conduct.
- Believe that Students cheat more in online classes than in the classroom.
- Caught students turning in work that wasn't theirs.
- Caught Student turning in work from a student in a previous class.
- Required the use of a proctor or administer for an exam.

7. DISCUSSION

The first research question attempted to discover if a correlation existed between age and gender with the authentication methods used. With such a wide-spread age group and a fairly distrusted gender population, the researchers hoped to analyze any trends or correlation that existed. Proctored exams were statistically significant with both age and gender, having a chi-square value of .034 and .02, respectively. Based upon these results, it seemed as age increased, faculty relied more heavily on proctors for their exams. It is possible that the younger generation of faculty are implementing other technological solutions for their exams or potentially modifying their assignments to promote independent work and analysis of the subject matter.

Although, it did not meet the requirements of being statistically significant within a value of .05, the use of Respondus Lockdown technology in relation to Age had a chi-square value of .097. Additionally the use of Turnitin.com for assignments analyzed with age had a chi-square value of .064, which was fairly close to the predefined boundary of .05 utilized to determine statistical significance. While none of the remaining authentication methods showed much of a statistical significance, the researchers felt it was important to note these two authentication methods given their chi-square values. It is possible that age had somewhat of an impact on the use of technology like Respondus and gender had an impact on the use of sites like turnitin.com.

Our second research question focused on preventative measures faculty used to prevent cheating and any experience they may have encountered with students conducting unethical behavior in an online course. Overall, 58.46% of the faculty felt that students cheat more in online classes than they did in traditional courses. Additional comments we received about this topic included faculty suggesting that

students had more liberty to use external resources to aid in their exams and assignments than the opportunities available during a traditional course. Supplementing this information, 82.81% of faculty stated they have caught students turning in work that wasn't theirs for an online class. Forty percent of the participants caught students submitting work in an online class from a student who previously took the class. With these results being much higher than expected, the researchers were interested to understand if faculty were aware that services exist to help students cheat in online courses and are faculty actively working to combat this unethical behavior. One of the faculty members responded that they had a student who posted an add on Craigslist asking someone to help him complete his coursework and exams. After some altercation between the student and the person who responded to the ad, the professor was contacted by the person who responded to the ad. He described the interactions with the student, the arrangements made, and provided detailed email communication illustrating the student was cheating in the course.

The researchers were a little surprised by the results of the survey questions related to the faculty members' efforts to combat unethical online behavior. Only 21.54% of the respondents had students sign an academic integrity policy. Additionally 40% of the faculty found examples where students submitted work from other students in previous semesters. Of the respondents, only 9.23% stated they reviewed online sites to see if copies of their exams and assignments were posted. At the end of the survey, the participants had the opportunity to submit comments based upon their responses. A large number of comments entailed faculty stating they were unaware of these sites and services and stated they will be making a better effort to implement the use of an integrity policy in their online courses. Given the lack of familiarity with these services and the participant feedback, the researchers concluded that with additional awareness, faculty may be more inclined to safeguard their courses against these unethical student acts.

8. CONCLUSIONS

Academic integrity has posed challenges to educators for many years. While universities continue to adopt technological advancements that offer a less restrictive environment for students, they also pose an additional layer of

risk in identifying student work and student identities for online courses. Many will say the first step to mitigate these risks is awareness of techniques students could adopt for unethical behavior in online courses. Based on feedback from this survey, the researchers are confident that many faculty would benefit from awareness and are willing to take the extra step in actively preventing unethical student behavior in their online courses.

However, another element to this issue is that certain faculty find teaching online "convenient" and merely try to replicate there in-class teaching methodology into their online course. For these faculty, awareness isn't the biggest hurdle they face. Some administrators might believe that the best solution is to merely prevent these faculty members from teaching online if they are unwilling to put forth the extra effort to prevent cheating. Another option is for the university to invest in additional staff or resources that can help aid the faculty in this initiative. Universities have many options available to them from various sites that will help assess the level of originality in student papers to services that offer proctoring of exams to ensure student identities. Of course, each of these options comes at a cost that universities may not be willing to absorb given the economic stresses surrounding higher education. However, failure to take preventative measures will likely cause negative effects to the university's reputation along with a potential decrease in enrollment if the university is perceived of lesser quality to their competitors by not implementing authentication measures in the online classroom.

9. REFERENCES

Baile, J.L, & Jorbert, M.A. (2008). Distance learning student authentication: verifying the identity of online students. *Finding Common Ground : Programs, Strategies and Structures to Support Student Success,* Vol. 3.

Cabrera, D. (2013, March). Tips to reduce the impact of cheating in online assessment. Northern Illinois University Instructional Design Center. Retrieved on May 17, 2015 fromhttp://facdevblog.niu.edu/onlinecheating

Database of Federal Legislation. (2007). Higher education opportunity act. Retrieved on June 5, 2015 from https://www.govtrack.us/contress/bills/110/hr4137

Grijalva, T., Kerkvliet, J., & Nowell, C. (2002). Academic dishonesty and online courses. Retrieved April 10, 2015 from http://oregonstate.edu/dept/econ/pdf/cheat.online.pap6.pdf

Hill, C. (2010). Student authentication: What are your duties under the HEA reauthorization? *Faculty Focus Special Report: Promoting Academic Integrity in Online Education.* 4-7.

Howell, S., Sorenson, D., & Tippets, H. (2010). The news about cheating for distance educators. *Faculty Focus Specialty Report: Promoting Academic Integrity in Online Education,* 4-7.

Jortberg, M. (2010). Experiencing verifying the identity of distance learning students. 26th Annual Conference on Distance Teaching and Learning. pp. 1-5.

Krask, A.M. (2007). Curbing academic dishonesty in online classes. TCC 2007 Proceedings. Retrieved on May 20, 2015 from http://etec.hawaii.edu/proceedings/2007.krsak.pdf

Krathwohl, D.R. (2001). A revision of Bloom's taxonomy. An overview in L.W. Anderson and D.W. Krathwohl Eds, A taxonomy for learning, teaching and assessing. A revision of Blooms Taxonomy of Educational Objectives, New York, Longman

McGee, P. (2010). Supporting academic dishonesty in online courses. TCC 2007 Proceedings. Retrieved on June 2, 2015 from http://www.thejeo.com//Archives/Volume10Number1/McGee.pdf

Michael, T.B., & Williams,, M.A. (2013). Student equity: Discouraging cheating in online courses. *Administrative Issues Journal, Education, Practice and Research.* Retrieved on May 1, 2015 from http://dx.doi.org/10.5929/2013.3.2.8

Monrose, F, & Rubin, A.R. (2000). Keystroke dynamics as a biometric for authentication. *Future Generation Computer Systems,* 16 (2000), 351-359

Moten, J., Fitterer, A., Brazier, E., Leonard, J., & Brown, A. (2013). Examining online college cyber cheating methods and prevention measures. *Electronic Journal of e-Learning, 11(2),* 139-146.

Paullet, K., Douglas, D.M. & Chawdhry, A. (2014). Verifying user identities in distance learning education. Who is sitting and

submitting from behind the screen? *Issues in Information Systems,* Vol 15, Iss, 1, 370-379

Rogers, C.F. (2006). Faculty perceptions about e-cheating during online testing. *Journal of Computing Sciences in Colleges,* 22(2), 2060212

Rowe, N.C. (2004). Cheating in online student assessment. Beyond plagiarism. *Online Journal of Distance Learning Administration*

7(2). Retrieved May 1, 2015 from http://www.west.ga.edu%7edistance/ojdla/summer72/rowe72.html

Watson, G., & Sottile, J. (2010). Cheating in the digital age. Do students cheat more in online classes? *Online Journal of Distance Learning Administration.* Retrieved May 17, 2015 from http://www.west.ga.edu/distance/ojdla/spring131/watson131.html

Appendices and Annexures

Table 4: Chi-Square Analysis of Authentication Methods

Chi-Square Analysis	Gender			Age		
Proctored Exam	5.378	1	0.02	48.12	32	0.034
Webcam Proctor	1.614	1	0.204	75	32	0
Keystroke Recognition Devices	---	---	---	---	---	---
Independent Coursework	0.132	1	0.717	20.159	32	0.948
Respondus Lockdown	0.48	1	0.489	42.733	32	0.097
Turnitin	3.424	1	0.064	31.598	32	0.487

Table 5:

	Integrity Policy	Online Services	Same Exams Each Semester	Online Sites
No	78.46%	60.00%	81.54%	90.77%
Yes	21.54%	40.00%	18.46%	9.23%

Table 6:

	Code of Conduct	Cheating Online	Other Student's Work	Previous Work	Using a Proctor
No	47.62%	41.54%	17.19%	60.00%	89.06%
Yes	52.38%	58.46%	82.81%	40.00%	10.94%