Examining Online College Cyber Cheating Methods and Prevention Measures

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Abstract: Academic dishonesty in the online cheating environment of distance education learning has gained traction in the past decade. By a few simple keystrokes, students' can find a wide array of online services for hire to write research papers, complete homework assignments, or enroll on behalf of the student on record to take the entire online course. While institutions in higher education have seen online learning as a vehicle to increase student enrollments adding to their bottom line, the number of Internet cheating companies to support academic dishonesty has also increased sustainability. Challenges dealing with academic dishonesty in the online area have become more rampant, leaving faculty and college administrators at odds how to prevent such behavior in both traditional and online classes. Finding new tactical tools to prevent cheating but more importantly providing students with an ethical and moral framework why academic dishonesty jeopardizes their future as a productive member of society.

Keywords: e-cheating, turnitin.com, writecheck.com, plagiarism, face-to-face, online

1. Introduction

The growth in online education over the last few years has been exacerbated by a competitive academic environment (Trenholm, 2007). The growth in online education presents both financial rewards for institutions and academic challenges. Given the autonomy of the students and their separation from the instructor, the ability to engage in cheating is inherently easier. Cheating is defined by King, Guyete and Piotrowski (2009) "as a transgression against academic integrity which entails taking an unfair advantage that results in a misrepresentation of a student's ability and grasp of knowledge" (p4). Cheating is also "referred to as academic dishonesty" (Trenholm, 2007, p. 284). Raines, Ricci, Brown, Eggenberger, Hindle, & Schiff (2011) conducted a qualitative study to determine the definition of cheating in the online environment from a student's perspective. Students defined cheating in an online class as going against university policy, benefiting from someone else's work and not using your own brain to get an unearned grade (Raine D.A., Ricci, P. Brown, S.L., Eggenberger, T. Hindle, T. &

Schiff, Mara, 2011). Raines and his colleagues found some students did not consider any actions to be cheating unless the dishonest behavior in terms of cheating unless they were caught.

Bricault's (2007) "Academic Dishonesty" provides a backdrop on various topics pertaining to cheating, legal issues and courses of action against such behaviors. Information access on the Web sharing via the Internet, dissemination makes cheating in an asynchronous online environment easier than in a traditional face-to-face classroom. Scanlon (2003) recognized that information technology has increased a student's ability to plagiarize written assignment. However, Scanlon felt teachers should take on the role of educator initially in cases of academic dishonesty. By reviewing and clearly articulating a school's academic dishonesty policy, teachers could positively affect a behavioral change. After educating students, institutions should use plagiarism detection software and innovative assignments to further mitigate technology enhance plagiarism. This is acceptable for first-time offenders, but repeat offenders should be dealt with differently; otherwise, students will continue to take the same online class and find new ways to cheat. This is especially true if the student feels there is no accountability is required when caught cheating the first time around. Additionally, instructors will become frustrated when the institution does not provide support to the instructor's actions against cheating in the online environment. The lack of face-to-face interaction, including tone and facial expression during communication, must be made up for in the online environment; otherwise, students will not view cheating in such a negative light and think that perhaps the next time they do it the same actions-

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rather than harsher actions- will be taken. Take for example an English Language Learner at a two-year career college. He copy and pasted his final research paper directly from key Web sites provided by a simple Google search. When confronted, he said he didn't know. The campus was concerned that if the school kicked him out of school for the incident they would be accused of racism. Instead, they allowed him to continue his online classes. He took the same class with the same teacher two more times. Each time, he was caught plagiarizing. He is now in his fourth year at the same school and in the same program. He is no closer to graduation than he was two years ago and his behavior continues a downward spiral. Caught cheating a third time, he swore at his teacher to the point she felt threatened.

However, Stuber-McEwen, Wisley and Hoggatt (2009) found that online students are less likely to cheat compared to traditional face-to-face students. Even though a few studies suggest that online students are less likely to cheat; the methods used to cheat are more complex and varied. Student perception of cheating behavior, attitudes, values and beliefs all must be taken into account. Studies which predict or assess students' dishonest behavior usually take the form of self-reporting. Perhaps, online students underreport their cheating behavior, which in-turn may distort the comparison results. Thus, the methods deployed to prevent cheating must be creative and deliberate.

Whether cheating in a face-to-face environment, or in an online environment student cheating behaviors appears to center around a recurrent theme. The "desire to get ahead" (Simkin, & McLeod, 2009, p.441) is the most common explanation for cheating. Other explanations students report includes the desire to help others, procrastination, the need to pass the class, course difficult, it doesn't matter if I cheat, or cheating is easy (Christe, 2003; Owunwanne, Rustagi, & Dada (2010). Anderman, Cupp and Lane (2010) linked impulsiveness to academic dishonesty. In a virtual environment, there is a sense of disconnect that can easily be interpreted for an attitude that the student won't get caught, the instructor isn't actually there, the instructor won't notice, or the instructor just doesn't care. The more impulsive a student is the more likely they are to be academically dishonest.

Students, who decided not to engage in cheating, cite a higher moral compass for their positive behavior (Simkin et al, 2009).

Students recognize cheating is wrong; however there are individual and situational factors which influence students' decisions to act academically dishonest. Individual influences include motivation, both intrinsic and extrinsic. Cramer (2009) discussed, "neutralizing attitudes" (p.295), and a culture of cheaters where value systems and moral behavior of students to complete. Intrinsic motivation includes the desire to learns and gain more knowledge while extrinsic motivation includes grades and recognition. Procrastination is key here, though. Although students may be motivated intrinsically, if they procrastinate, they will resort to extreme measures to submit assignments by the deadline to stay in class. They may begin thinking they'll only do it once to get by, but the procrastination continues and they find themselves in a pattern to beat the clock. It isn't like a traditional classroom environment where they must set aside a day and time to devote to lectures and studies. When students are faced with situations where others are cheating, or experience peer pressure their propensity to cheat is magnified (Rettinger & Kramer, 2009).thics also play a large role in how student perceived cheating. Ethics are shaped by an individual's value system and core beliefs (Owunwanne, Rustagi, & Dada, 2010). If based on a student's ethical code, cheating is a justified means to an end, then some students may feel cheating behavior is warranted. To justify cheating behavior some student use neutralizing attitudes. Again, I think it has a lot to do with the fact they can't see a teacher's disappointed face when they meet to discuss the incident. They don't necessarily have the same type of respect for their online teachers because they usually never meet them face-to-face. That's why personalizing the online learning environment is so important. Instructors need to call students, let them hear their voices, upload photos, personalize class and activities to make it "real" to students.

When the internet was in its infancy stage, pilot online college courses were being developed and administered (Grenier-Winter, 1999). Grenier-Winther (1999) expressed concerns about many issues including; pedagogy, time management, student isolationism, new technology instruction, security and copyright infringement in the delivery of online education. Grenier-Winther (1999) also mentioned that assessments would need to be password protected. However, students could easily share the passwords which compromise the integrity of the assessment. An alternative to this is to change the password on a regular basis. If the password constantly changes, the student must put more effort into cheating by arranging

someone else to take the test at a specific time and within the password's window of validity. This also applies to using timed assessments.

Actual situation: An instructor in an introductory Spanish class at a two-year community college required one-on-one phone conversations with her students during the first week of class. These phone conversations were recorded. When it came time for an assessment, the student was required to call the instructor at a predetermined time for the password. The instructor gave the password only if she recognized the voice as that of the student's. The student then had a set amount of time to take the assessment (less than 90 minutes) before the password expired, the session timed out, and the student failed to pass the assignment.

Another situation: In math and sciences classes where students work out mathematical equations, they must complete the graded activities via screenshare technology and using a web cam. The sessions are recorded as proof the student completed the activity. The instructor is able to watch the student on the web cam work out the problem either via a shared screen or an interactive white board within the Web meeting room. Courses offered completely online have been around for more than 10 years but concerns about academic dishonesty still exist.

2. Brief literature review of e-cheating in college studies

Etter, Cramer & Finn (2007) compared two distinct student populations to assess their perception on cheating with information technology. One group of students was a private religion affiliated university and the other was a regional research institution. The sample size for the students from the religion affiliated college was 237 students and 202 students for the regional research institution. The student at the church-affiliated indicated that cheating was more offensive compared to the students at the regional research institution. King, Guyette & Piotrowski (2009) also conducted a study to gauge the attitudes of undergraduate students about using technology to cheat online as compared to traditional classroom. Of the 121 undergraduate students at least 73% of the students felt it was easier to cheat on line. However, when here was a written policy against cheating or academic dishonesty the percentage who felt that cheating was appropriate declined significantly (King et, al 2009).

Stuber-McEwen, Wiseley, & Of the 225 students 87 were traditional of face-to-face. Of the 225 students 87 were traditional or face-to-face students and 138 were online. The purpose of the study was to determine if students cheated more online or in traditional face to face classes. The results of the study suggest that students cheated in traditional classes as compared to their counterparts in online institutions. The reasons cited for dishonest behavior on online classes was the distance from other students and the teachers. Student reported a feeling isolated and disconnected from the learning environment. They also begin to feel frustrated when they don't get the help they immediately need. A student may log into class at 11:00 p.m. on Saturday night to attempt all work for the week. When s/he has a question about the material or assignment, the student is frustrated when an immediate answer is not readily available. If the due date is that night, the student may feel inclined to cheat in order to resolve the situation.

Watson & Sottile (2010) conducted a study of 635 students to find out if students cheated more online or in face-to-face classrooms. Of the 635 students, 451 were female and 175 were male. The remaining 9 students did not report their gender. The results were separated into three sections: self-reported, knowledge of other student cheating and perception of academically dishonest behavior. Over 30% of the students admitted that they cheated on both environments. However, the differences between cheating online and face-to-face were not statistically significant at <.05. Students also admitted that they were more than 4 times as likely to cheat in an online class when compared to face-to-face classes (Watson & Sottile, 2010). Kidwell and Kent (2008) utilized a research instrument created in the United States, by McCabe and Trevino (1993) to ascertain whether students in Australia cheated more in an online classroom when compared to face-to-face classes. Surveys were randomly sent to 1500 students. Only 459 returned surveys were usable with 210 composed of face-to-face students and 248 being online students. The results of the study suggested that online students cheated less that face-to-face student which contradicted prior studies.

Mirza & Staples (2010) wrote about using webcams as an innovative method to reduce or eliminate cheating by nursing students taking an on-line course. Students were required to purchase a webcam and participate in a practice exam session to gain proficiency prior to taking their actual exam. Courses with labs often do this,

too (for example: a biology class may include a mandatory dissection in front of a webcam) After completing the exam the 44 students were given a survey which asked how they felt while being constantly monitored. Students reported that they were less likely to cheat; felt uncomfortable but only 19 thought this web cam would prevent cheating. Webcam use in online examination for higher education is new but state exams such as insurance licensing agencies use webcam to monitor all individuals who take the exam. Instructors can also require students to hold school ID badges or government issued IDs up to the web cam to ensure it is the actual person and not someone else taking the assessment.

Comas-Forgas and Surede-Negre (2010) conducted a study to determine why student choose to plagiarize. The study had both a qualitative and quantitative component. The study was given to 727 randomly selected undergraduate students. Only 19 of the survey were unusable. There were there 4 questions which receive the most responses out of the 16 questions asked. The following reasons why students plagiarize were cited by over half of the students surveyed. The four primary reason students gave for plagiarizing were easy access to information, not enough time, procrastination and too many assignments to complete. For the qualitative part of the study a focus group was conducted. Three major theses that led to Plagiarism were identified. The first reason cited was student behavior, the second was teaching staff causes and finally the internet explosion. The majority of the responses were against teachers. Students cited that a teacher's behavior and attitudes as the primary reason students plagiarize.

Reasons students choose not to cheat in college give insight to how honest students are about cheating behaviors. Miller, Shoptaugh and Wooldridge (2011) surveyed 1,086 undergraduate and graduate students to link reasons why they did not cheat with how much they cheated. When the reason for not cheating dealt with the fear of getting caught, these students report more incidence of cheating behavior. However, when students reported that they chose not to cheat because of values and integrity, they reported less instances of cheating behavior (Miller, Shoptaugh & Wooldridge, 2011). Online courses need to be designed in such a way that activates intrinsic learning desires. This is the best way to avoid plagiarism and situations involving cheating because the student wants to learn and apply the knowledge to their academic, personal, and/or professional worlds.

3. Cheating in an asynchronous online environment

Students have many options when it comes to receiving unethical assistance in the online class environment. Rowe (2010) cited three common methods students used to cheat in online courses. Students wait to take their assessment so they could get answers from others, students retook assessments based on false claims and students received unauthorized assistance during exams (Rowe, 2010).

4. Online cheating methods

The following sections address online cheating methods, however in face-to-face classes students look at each other's exams, send signals, or exchange answer in the rest room. Also, teachers in face-to-face classroom were required to walk around and require students to take everything off of their desk and notify them that they cannot leave until the exam is over. There are many more options to cheat online. Students wait for answers, claim fraudulent error messages, collusion, essay plagiarism and buying answers.

Waiting for Answers. In some online courses the instructors allows a few days to take an assessment. Since there is flexibility with which to take an assessment, some students wait until other have an opportunity to take the exam so they can get the answers. Some online courseware programs prevent students from printing out the entire exam at once, but the screen print function allows for each question one at a time to be printed. When exams are due at a specified time, some severs can't handle to intense load and they crash or temporarily are taken offline. There are also programs that will lock-down the screen once the assessment begins. The assessment is timed and a student cannot navigate anywhere else on the computer until the assessment is submitted. However, the way students get around this is by setting up two computers- one for the assessment and one to browse the Web and find answers.

Fraudulent Error Messages. Students, who are not prepared for an assessment, try to get an advanced look at the questions so they claim the computer systems showed an error message. Since the instructor has to read the email message and reset the exam attempt, the students has more time to prepare and in some cases look up every answer with a preprinted exam. Students do this with papers, too. They submit corrupted files which

gives them more time. Many times the instructor won't try to open the document until at least the next day. By the time the instructor notices and notifies the student, the student has bought at least another 24 hours in most cases.

Collusion. Although students take classes from anywhere in the world, there is still an opportunity to collude and work on individual assessments together. Students use cell phones, and the internet to work on assessments together at a distance. Rowe (2010) described methods whereby students still do some of their work themselves. However, some students have the options of having someone take their entire course by providing their login and password. Most learning management systems have a reporting tool that allows the instructor and administration to view I.P. addresses. This helps a little because the school can see if students were using the same computer. If an assessment is submitted by multiple students on the same computer within a short timeframe, we know we have a problem.

Essay Plagiarism. Additionally students' copy and paste entire passages from the internet without citations on essay or short answer assessments. Sometimes there is a requirement to submit essay question responses to plagiarism software, but this method waste a lot of time. Course designers usually try to scaffold these types of assignments so students submit pieces of it over an extended length of time. If they submit a thesis statement, outline, rough draft, etc., it is hard to turn in a paper that doesn't match what they already submitted.

Purchase answers. Websites such as brainmass.com allows student to submit exam questions and purchase the answers. If a student has a lot of time to take an assessment they will be able to locate the answer in time to receive a good grade. Of all the method listed this method may do the most harm. Once the test banks are compromised it is difficult to make up new test questions that are closely aligned with the textbook.

I recently found that a company had published a course shell on the Internet. The school bought the course from the company three years ago and actively uses it. However, the company placed all of the answers to quizzes online as "Instructor Resources" without notifying the proper people at the school. A student finally brought it to our attention that she could simply Google the question and the answer would be in the search results. This is obviously a huge problem because the school paid money for a course and expected the publisher not disclose test answers on the Web.

5. Methods to employ in order to minimize e-cheating

Unless there is a requirement for a large amount of synchronous (real-time) interaction between an online instructor and individual student it is difficult to establish an influential rapport. Interaction allows an instructor to become familiar with a student's background, writing style or testing acumen. By assessing a student's discussion board posting and relies the instructor can get a feel of how a student writes.

Online assessment must be designed with the belief that student will utilize their text book and any note. When the risk of academic dishonesty is considered throughout the course development stage, courses are more comprehensive (Trenholm, 2007). It is very difficult to prevent all forms of online cheating or plagiarism but there are ways to minimize the academically dishonest behavior (Rowe, 2004). Some common methods to prevent e-Cheating are requiring students to sign and return an academic dishonesty statement, the use of multiple testing centers, the use of a non-related proctor, use testing software that prepares randomized questions so no two exams are exactly alike, protect test bank access, and create multiple versions of each assessment.

Styron & Styron (2010) coined the word e-cheating when describing dishonest behavior in an online course. Traditional exams such as true/false and multiple choice exams provide more opportunity for students to be academically dishonest. Additionally, mobile devices such as cell phone make it easier to cheat in an face-to-face classroom.

6. Cheating curtailment methods

King et al., (2009) suggested that instructors use shorter time-lines, or essay question format exams which will assist at curtailing online cheating. Christie (2003) suggested some very creative methods to employ to prevent or curtail cheating in an online classroom. The method suggested included monitoring students activity using

time logs, "setting a trap" (p.57), webcam usage, changing class each semester and creating a class mole (Christie, 2003).

Policy dissemination. The immorality of cheating must be accurately portrayed and consequences for being caught must be explained thoroughly (Chiesl 2007). Most schools have academic dishonesty policies which serve as the first line of defense. Since some students do not read the policies, there should be a requirement to click a confirmation button before a student is allowed to enter the online course room. If a student is caught being academically dishonest and claim they did not know the policy then the institution would have legal recourse. Prior studies have shown that having a clearly articulated policy against cheating decreases the behavior.

Strict Test Taking Time-Line. When an assessment is taken there is a log of the time when the exam was accessed and completed. Incredibly short times are an indicator that dishonest behavior maybe taking place. Sometimes it is advantageous to give students short time frames to take exams. Where there is not enough time for a student to look up answers or search the internet they are deterred from relying on cheating in the future.

Cheating Trap: Setting a trap involves creating a website what purports that it has answers to a particular assessment, however all answers given are incorrect. When a student performs a web search the site used as a trap could be found. Dishonest student would accept the incorrect answers unknowingly.

Surveillance. A webcam could be required; however students who are not in view of the camera could still offer assistance. Another issue with a webcam is costs. It may be difficult to require a student to purchase a webcam.

Class Mole. The most creative method suggested by Christie (2003) was the use of a class mole. The instructor could enroll as a student under a different name. When students discuss cheating amongst themselves the dishonest students would be caught by the instructor while committing the offense (Christie, 2003). The majority of students won't discuss this sort of thing within the LMS or the LMS' messaging system. If it is done, it is done offline and in one-to-one communications.

Randomized exam questions and responses. Online class platforms such as Blackboard and WebCT have an assessment features that allow instructor to randomize the questions. All questions available in a pool of questions should be uploaded. If two students attempt to sit next to each other and cheat their exams will be different. Some textbook publishers have web based assessment tools that have so many questions that it is rare for students to have the same questions. These procedures would decrease a student's ability to collude. When an instructor is given the opportunity to select questions they should sleet them randomly across different chapters instead selected each chapter in continuous blocks (Chiesl, 2007).

Statistical Analysis to Detect Common Errors. Although the following cheating detection method was originally used for face-to-face paper-based exams, perhaps the methodology could be adapted to online exams. When students miss the same questions on a multiple-choice exam there may not be an issue of cheating. However; when students miss the same questions, with a number of the same incorrect choices, there may be a cause for concern. Harpp and Hogan (1993) developed a statistical program that computed "errors in common (EIC, i.e. questions answered incorrectly) and exact errors in common (EEIC, sometimes termed "exact wrongs") (p. 307). An EEIC/EIC ratio that exceeded 0.75 gave a possible indication that cheating was happening. Nath and Lovaglia (2009) felt that even though a Harpp-Hogan index exceeded 0.75, this was not enough proof to accuse a student of cheating. To improve on the results and be surer of cheating Nath and Lovaglia (2009) added an additional step to the Harpp-Hogan index by computing a probability index.

The probability index was designed to determine the chance that two students who sat in close proximity to each other did not cheat. To accurately deploy the new EIC index it is useful to have a designated seating chart and/or place sequential serial number on each exam. If a probability index of < .001 is obtained then the associated students are interviewed. A probability index of < .001 means that is less than "one in a thousand (p.5), that two students chose the wrong answers independently. Once the students are interviewed and one or both confesses, the students receive disciplinary actions. Other students may be deterred from continuing the behavior.

Proctoring. Exam proctoring works well when an institution has a testing center where I.D.'s are checked and verified. However, when a student is in a remote location organized proctoring may be an issue. Even when a proctor is present it is difficult to eliminate all forms of cheating (Grenier-Winther, 1999). Without a proctoring program in place the online environment lacks academic rigor necessary to facilitate learning (Lorenzetti, 2006).

7. Plagiarism curtailment strategies

Plagiarism involves using someone else's words without proving proper citation to give the author proper credit. Plagiarism has been around in colleges since the 1890s (Thompsett & Ahluwalia, 2010). Although many institutions have written policies pertaining to plagiarism, those policies are rarely read by students (Owunwanne, Rustagi & Dada, 2010). Flannery (2004) suggested that students plagiarized because writing papers were seen as irrelevant. Instead of papers on already regurgitated past subject, if students were required to write about a current or relevant topic for a particular subject matter, perhaps students would plagiarize less. Prior to the information technology age, plagiarism was a lot harder to detect. An instructor had to rely on experience and the ability to recognize copied work. The internet and assignment databases make it a lot easier to find out if students are using someone else's work and take credit.

Similarity Detection Software. The most common way to detect plagiarism is to use similarity index software such as Turnitin.com (http://www.turnitin.com), WriteCheck.com (http://www.writecheck.com), (DupliChecker.com (http://www.duplichecker.com) and others, which checks all submitted papers and computes a similarity index (Scanlon, 2003). The similarity index shows all instances of potential plagiarism. Once a similarity index is obtained the instructor must make a judgment call to determine or further investigate if the student has plagiarized. If the instructor required a very low level of similarity, students will be forced to use original thought in writing papers or answering essay-type questions.

Strict Writing Guidelines. Sterngold (2004) once used paper strengthening techniques which actually worked well as anti-plagiarism techniques. Sterngold's techniques included requiring students to submit copies of the sources to writing papers relating to a class discussion or book chapter instead of students being able to pick their own topic.

8. Conclusion

Online learning was once a new and exciting opportunity for a school to grow its student body. Today online education presents unique challenges and also unique opportunities (Trenholm, 2007). The primary area of concern when it comes to assessment is academic dishonesty in the form of cheating. There are numerous ways for students to cheat in the asynchronous online environment. It is up to educators to employ more effective measures to curtail the academically dishonest behavior. This paper discussed e-cheating methods, and possible countermeasures to prevent those methods. Written academically dishonesty policies set a good foundation for any preventive program, but a signed document is not enough. Educators must become more technologically savvy in order to develop alternative means of assessment for online classes. More complex and innovative techniques must be developed in an attempt to mitigate dishonest behavior.

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