Impeding Students’ Efforts to Cheat in Online Classes

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ABSTRACT

This paper identifies several methods a student could use to cheat while enrolled in an online course. Problems encountered in conducting an online course and in administering an online exam involve: (1) identifying the test taker, (2) preventing the theft of the exam, (3) combating the unauthorized use of textbooks and/or notes, (4) preparing an online exam and exam setup, (5) realizing a student may have access to a test bank, (6) preventing the use of cell phones, hand-held calculators, and/or Bluetooth devices, (7) limiting access to other individuals during the exam time, (8) ensuring a student is using a computer with adequate uploading and downloading capabilities, (9) identifying intentional computer crashes, and (10) noting the different methods of proctoring exams. The authors are full-time educators but are not primarily online teachers; however, they regularly teach one or more courses either in-load or as an over-load. This paper draws on the authors’ experiences and efforts to teach online at both the lower and upper division undergraduate levels, as well as, the graduate level with efforts to give a student a comparable experience to a live classroom. The authors utilize Blackboard as their university’s uniform course platform and refer to Blackboard’s available options to inhibit cheating which share common selections with most online course platforms. An attempt is being made with this paper to help other instructors benefit from the authors’ mistakes and successes.

Preventing the Theft of the Exam

Exam theft is an instructor’s concern whether the test is administered face-to-face or online (Miller, 2012). When one question is compromised, the integrity of the exam is affected; however, when the entire exam is compromised, all of the instructor’s efforts to create a meaningful assessment tool are damaged (Lanier, 2006). Even when exams are monitored online, copies of the entire exam can be made accidentally or on purpose. If an instructor desires to protect an exam from being copied in whole or in part, the instructor should be aware that Microsoft Word and similar programs will automatically make a copy of the exam on the student’s computer when the document is opened. Illustration 1 shows a “screen capture” of a computer directory made automatically by a computer when a document is opened. In the left pane of Illustration 1, the path to the temporary folder is shown as “Desktop\Richard Griffin (name of the computer user on this machine)\AppData\Local\Temp”, and the contents of the “Temp” directory are shown on the right side of the illustration. Richard Griffin, an online instructor had been grading resumes prepared using Microsoft Word on May 5th. Notice the first file on the left has a May 11th date. On the left side of the right pane, one can also observe that the fourth file is a copy of the syllabus the instructor had opened from the course web site earlier in the day. Documents are automatically saved by the computer in this directory without affirmative action taken by the user. This directory may also be reached by looking on the computer’s operating drive – C:\Users\rgriffin\Richard Griffin’s user name on this computer)\AppData\Local\Temp. If an instructor was monitoring
Preparing Online Exams and Exam Setup

If properly performed, the preparation of the exam and the platform on which it is to be administered can help reduce the sharing of exam content information. At least some research exists to indicate that the environment (online or face-to-face) in which a student takes an exam does not impact his likelihood to cheat (Hollister, 2009). While the majority of students will behave in an ethical manner during an online course including the testing in the course, the authors have experienced the impact of cheating by at one student in each online course taught; therefore, the Hollister research has not proven true. The authors attempt to make an online course as similar to a live classroom as possible; therefore, an online exam often includes true/false questions, multiple-choice questions, essay questions, and numerical problems as the exam for a live classroom would include (Watson, 2015). A multiple-choice question from an accounting online exam is shown in Illustration 2 as an example of how not to setup an exam question.

Looking at the question and the five (5) answers above, one can see that there are no numerals or letters before the answers. In the online course, creating a question that algorithmically changes the numbers for each student or draws a different but similar scenario for each question can be helpful but, like many aspects of online teaching, can be very labor intensive at the beginning.

By presenting the question with a numeral or letter reference to the left of each answer, Student X would more likely answer “B” to the request by Student Y for the correct answer. The second step is to randomize the answers (online or face-to-face) in which a student takes an exam does not impact his likelihood to cheat (Hollister, 2009).

Illustration 2

A Multiple Choice Question on the Exam Platform

Without Numeral or Letter References to Answers

(Less Effective to Thwart Cheating)

Illustration 3

A Multiple Choice Question on the Exam Platform

With Numeral or Letter References to Answers

(More Effective to Thwart Cheating)
not change the response in Illustration 2, but the response could be different in Illustration 3 resulting in the incorrect answer being given for Student Y’s exam.

Blackboard (and other course platforms) allows the instructor to select a variety of options in administering the exams for the entire class. Illustration 4 shows the typical platform options available to instructors within Blackboard’s Multiple Choice Question platform.

The “OPTIONS” heading is followed by four (4) instructor selections. The first selection involves the ability to number answer choices automatically using either a numeral or letter identifier for each answer. Regarding the “Answer Numbering” option, the default is set as “None.” In Illustration 4, the option chosen is “Uppercase Letters (A, B, C)”. The other choices available are “None”, “Lowercase Letters (a, b, c)”, “Arabic Numerals (1, 2, 3)”, and “Roman Numerals (i, ii, iii).” The last selection involves the ability to randomize the answers displayed for each student. Regarding the randomizing of answers, the default is set to present the answers consistently on every student’s exam. In Illustration 4, the instructor has checked the box to randomize the answers so that ordering of the answers within each individual question for the exam, checking will just randomize the answers so that ordering of the answers will be saved each time the student goes from one question to the next or because the student suddenly realizes that the wording used by Blackboard is shown.

The third option presented in Illustration 7 allows the instructor to allow a student “Multiple Attempts” to take the exam. An instructor may want all students to take the exam only once but may be concerned about addressing a student’s late night computer crash that may occur while taking the exam. The authors strongly recommend the instructor leave the “Multiple Attempts” box as unchecked unless an instructor truly intends to allow a student to improve his grade on the exam by taking full advantage of all available attempts. The authors recommend that an instructor allow only one attempt at an exam (i.e., return to a question that has been skipped or previously answered (backtracking)). The authors generally prohibit the instructor needs to decide if the student will be able to return to a question that has been skipped or previously answered (backtracking). The authors strongly recommend the instructor leave the “Multiple Attempts” box as unchecked unless an instructor truly intends to allow a student to improve his grade on the exam by taking full advantage of all available attempts. The authors strongly recommend the instructor leave the “Multiple Attempts” box as unchecked unless an instructor truly intends to allow a student to improve his grade on the exam by taking full advantage of all available attempts.

The final option presented in Illustration 7 allows the instructor to set a password for the exam. The authors recommend the establishment of a password for the exam even if the exam is to be administered with the use of an online proctoring service. Passwords are case sensitive; however, Blackboard does not require the use of a number or symbol as part of the password.

Platform Options shown in Illustration 8 are concerned with how an exam is presented to a student. Options for how an exam is to be presented to the student are available. The first option is selecting whether to allow a student to observe the entire exam all at once or whether to allow the student to view one question at a time. The authors normally select one question at a time. The authors’ experience in this approach has resulted in fewer computer crashes than making the whole exam viewable at the same time. Whether this result is because the exam will be saved each time the student goes from one question to the next or because the student suddenly realizes that more studying should have been done, the authors are unsure. If the “one (question) at a time” option is chosen, the instructor needs to decide if the student will be able to return to a question that has been skipped or previously answered (backtracking). The authors generally prohibit backtracking. Again, fewer student computer crashes occur in the authors’ experiences. Choosing to present one
question at a time with no backtracking also enhances the authenticity of the exam if a student does experience technical difficulties. In that case, Blackboard allows the instructor to view the student’s time spent per question in order to determine at what question the student should return in order to complete the exam without question overlap. The instructor should be prepared to manually grade a test having these types of difficulties or issues. The procedure for accessing this information will be presented later in the paper.

An instructor also must decide how much information about the test results will be available to the student and at what point in time that information will become available. Illustration 9 shows the options available in Blackboard regarding this topic. On the left side of Illustration 9, Blackboard gives an option on “When” the results are available. Within that drop box, the options are “After Submission,” “One-time View,” “On Specific Date,” “After Due Date,” and “After Availability End Date.” After the instructor has chosen the “when” option in the first drop down box, he must then select the type of information to release with the choices being: Score per Question, All Answers, Correct Answer, Submitted Answer, Feedback, and Show Incorrect Questions. The authors encourage an instructor who prepares a purely objective style exam to select only the score per question option box because the authors have found that regardless of the box checked, the student can view his grade as soon as his exam has been graded.

In order to eliminate a student’s ability to view his exam grade until the time preferred by the instructor and thus eliminating a student’s desire to question the result of his individual performance on the exam until the instructor can review the overall exam results, the authors insert an “Essay Question” on each exam. The wording of the essay question is shown in Illustration 10 and can allow for a double benefit. The first benefit derived from the above question is the gained ability to control the release of the entire exam score to the student because any essay question (even the one shown in Illustration 10 in which the student is not required to answer) requires the instructor to grade the question manually before the overall exam score can be determined. The second benefit derived from the above question is the ease over which the instructor can allow a curve over the entire exam for all students as the title of the question would hint. The initial number of points available for this question is set at zero. After all exam are submitted and the overall performance of the class is reviewed, an instructor who desires to allow a curve on the exam may do so easily by altering the points available for this “curve” question to the desired curve for the exam. When the instructor is ready to reveal grades, the master exam originally prepared by the instructor is edited. The instructor goes to the “Curve” essay question and clicks the “0” to the left of Points for the question in Illustration 10. The “0” is clicked, the “Points 0 (Extra Credit)” in the upper left side of Illustration 10 expands to view in the upper left side of Illustration 11.

When the instructor inserts a value in the box entitled “Update Points” and clicks “Submit,” the instructor is asked by Blackboard if all completed exams linked to this question should be updated. If the instructor answers positively, three tasks are achieved: (a) the score entered for the question on the master exam is saved, (b) the same number of points indicated for the question on the master exam is also entered automatically on each student’s exam, and (c) each student’s total exam score is automatically calculated and posted in the platform grade book.

Realizing a Student May Have Test Bank

Most instructors realize that students have access to a test bank for most textbooks. A recent search on eBay for “test bank” returned 797 listings as shown in Illustration 12.
More options to acquire a test bank could be found by clicking on "Related" within Illustration 12 such as: test item file, instructor solutions manual, nursing banks, teacher resource book, and other suggestions. If an instructor uses a test bank for purposes of official course evaluations, that instructor should alter the testbank questions in order to safeguard the integrity of the exam as a true measure of a student’s knowledge of the material presented instead of a measure of a student's ability to acquire the test bank. The authors encourage instructors to use the test bank questions as templates in order to rewrite the question into a new creation not subject to an easy electronic search for a correct answer.

As can readily be seen, the entire question is not shown, only part of the first sentence of the question. If the test is timed, a student desiring to make inappropriate use his acquired electronic test bank file needs to have an idea what chapter the question is from and then make a quick scan the first five or six words of the question to match it to the exam being taken. The same is true of “Multiple Choice” questions as shown in the sample in Illustration 14.

Illustration 14 presents a more worrisome example of how a student may cheat when the question posed on the exam is one involving a particular fact pattern for analysis. For example, the last question listed in Illustration 14 begins “Wallah Company agreed to accept $5,0000 in cash along with an $8,000, 90-day...”. To find the answer to the question, a student only needs an independent internet connection and new window with Google access as seen in By clicking on the second search result shown in Illustration 15, the student will be taken to a website that charges a fee for the correct answer; however, the third search result will take a student to a website shown in Illustration 16.

As you can see from the screen shot above, this website discloses the entire question, all answer choices, and the correct answer all of which are provided free of charge. Another safety precaution taken by the authors when using the textbook’s test bank is the decision not to group the True/False or Multiple Choice questions by chapter unless the exam only covers one chapter. Additionally, the authors alter the beginning language of each question which will make each question harder to identify. In some cases, the authors have reworded the question only in subtle ways so as to change the correct answer choice but have left the former correct answer as a possible choice. This method will cause a student who is using inappropriate test bank material under time pressure to choose the answer labeled by the test bank as being correct when, in fact, that answer is now an incorrect choice for the slightly altered test question.

A student with access to an electronic test bank will benefit from answers to objective as well as subjective questions. Illustration 17 shows a screen shot of a sample set of questions that are essay and fill in the blank.

The first question seen in the above illustration is an essay question. A student with access to this electronic test bank could easily click on that first question and see the additional information shown in Illustration 18.

In order to impede the efforts of the student to gain an unfair advantage by using the test bank, the authors would rephrase the question as shown below:

Dickens Incorporated ages its accounts receivable every July 31 in order to ascertain the amount of its bad debts adjustment. At the current fiscal year’s end, management estimates that $16,900 of the accounts receivable balance would be uncollectible. The Allowance for Doubtful Accounts has a debit balance of $3,200 before any year-end adjustments for bad debts. Prepare the adjusting entry that Dickens Incorporated should make on July 31, of the current fiscal year, to estimate bad debts expense.

The rewording above focuses on the name of the company, the date of the adjustment, and the ordering of certain phrases. These small changes can significantly reduce the usefulness of the textbook. For additional safeguards, the authors could alter one or more of the numbers contained

Illustration 13

Sample True/False Questions for an Electronic Test Bank

<table>
<thead>
<tr>
<th>Question</th>
<th>True/False</th>
</tr>
</thead>
<tbody>
<tr>
<td>A wholesaler is an intermediary that buys products from manufacturers or other wholesalers and sells them to retailers.</td>
<td>True/False</td>
</tr>
<tr>
<td>A retailer is an intermediary that buys products from manufacturers and sells them to the final consumer.</td>
<td>True/False</td>
</tr>
<tr>
<td>Cost of goods sold represents the cost of buying and preparing merchandise for sale.</td>
<td>True/False</td>
</tr>
<tr>
<td>A company had sales of $350,000 and cost of goods sold of $200,000. Is gross profit $150,000?</td>
<td>True/False</td>
</tr>
<tr>
<td>A company had not sales of $445,000 and cost of goods sold of $495,000. Is gross loss $50,000?</td>
<td>True/False</td>
</tr>
<tr>
<td>A company had a gross profit of $391,900 based on sales of $400,000. Is cost of goods sold $9,100?</td>
<td>True/False</td>
</tr>
<tr>
<td>A merchandising company’s operating cycle begins with the sale of merchandise.</td>
<td>True/False</td>
</tr>
<tr>
<td>Merchandise inventory is reported in the long-term assets section of the balance sheet.</td>
<td>True/False</td>
</tr>
<tr>
<td>Cash sales shorten the operating cycle for a merchandiser; credit purchases lengthen it.</td>
<td>True/False</td>
</tr>
</tbody>
</table>
in the problem so that the answer would be also change. The best yet the most time consuming solution to the problem of a test bank being readily available to a student who desires it is for the instructor to write original questions. Also, one of the authors received permission from a textbook company whose books are used in the department to use questions from a competing textbook that has not been adopted by the department.

When a student’s computer crashes during an exam, the instructor should rightly be suspicious of the circumstances surrounding the crash. In some cases, a computer crash is a completely innocent result of a faulty connection or weather-related issue on either the university’s or the student’s side of the line. The problem occurs when the crash is a result of a deliberate attempt by a student who has seen some or all of an exam’s questions and who desires to delay answering those questions until after the student engages in additional study time or conducts a search of material for the exam answers (Cizek 1999). Often the platform through which an instructor administers an exam can assist in determining how much information was visible to a student prior to the crash; therefore, the settings chosen by the instructor in creating and administering the exam become even more useful. This situation is another example of why the authors encourage an instructor to present exam questions to an online student “one at a time” instead of “all at once” and without the ability to backtrack to prior questions.

Student’s Computer Experiencing a Crash During an Exam

When a student’s computer crashes during an exam, the instructor should rightly be suspicious of the circumstances surrounding the crash. In some cases, a computer crash is a completely innocent result of a faulty connection or weather-related issue on either the university’s or the student’s side of the line. The problem occurs when the crash is a result of a deliberate attempt by a student who has seen some or all of an exam’s questions and who desires to delay answering those questions until after the student engages in additional study time or conducts a search of material for the exam answers (Cizek 1999). Often the platform through which an instructor administers an exam can assist in determining how much information was visible to a student prior to the crash; therefore, the settings chosen by the instructor in creating and administering the exam become even more useful. This situation is another example of why the authors encourage an instructor to present exam questions to an online student “one at a time” instead of “all at once” and without the ability to backtrack to prior questions.
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Spring 2017 (Volume 13 Issue 1)

Journal of Learning in Higher Education

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until the student reached Question #45. As seen in Illustration 21, which is a log of the next attempt there were 49 questions on the exam; however, Illustration 20 showed only 44 questions indicating questions 45 through 49 had not been viewed by the student.

One possible explanation of the problem experienced by the student depicted in the last two illustrations is that the student’s computer lacked adequate upload and download capabilities. This lack of capability can be exacerbated when an instructor allows all exam questions to be presented to a student at the same time. Depending on the size of the file or additional graphics or videos that may be embedded, a student with an older or a less expensive computer may experience a great amount of trouble in taking the exam.

Other concerns faced by the authors regarding the administering of online exams are (a) the length of time that elapsed between the computer crash and the student’s initial attempt to notify the instructor, (b) the method by which the instructor was contacted (i.e., a late night email from the student timed to allow the rest of the evening to pass before the instructor could likely reply to the student), (c) the length of time that elapsed between the instructor’s reply about the crash to the student’s receiving the information (i.e., a student who delays checking email hoping to gain additional study time for the exam), (d) the number of questions viewed (or captured by screen shots taken) by the student who experiences a computer crash, (e) the true identity of the individual who is taking the exam, (f) the student’s ability to discuss a question with another person either using live conversation or electronic communication, and (g) the student’s ability to use unauthorized textbooks, notes, devices (including handheld calculators with memory options) or other materials.

The answer to most if not all the previous questions posed is the use of a proctor. The authors have had experience with several methods of proctoring.

Different Proctoring Methods

The ideal testing environment involves a face-to-face meeting of the enrolled student and the course instructor. This ideal environment is possible in an online class but is not usually practical because of the likely distance that exists between the student and the instructor and because of the time commitments of each party. When feasible, the authors have given students the choice of taking the exam online or coming to campus and taking the exam with an on-campus section of the course being offered. Several companies offer proctoring services. The following list is not exhaustive but is one the authors have actually used, considered, or are considering. Their list consists of Respondus LockDown Browser, Remote Proctor [RP Now], Proctor U, Examity, Kryterion, Proctor Free, Tegrity, and B. Virtual, Inc. The first one tried and still used in some cases is Respondus LockDown Browser. This option is free to the students and supposedly prevents the student from visiting computer sites or using other computer programs while taking an exam; however, the instructors have been sent screen captures which are supposedly not possible from students. In addition, students could still use cameras to make copies of the exam or utilize a smartphone, tablet, or second computer to access information. Respondus Monitor has been added to this service which integrates webcam technology, but the authors have not tried this feature at this point in time.
One available option is the use of Skype or FaceTime by the instructor for each student taking the exam. This option requires a large time commitment by the instructor and would not be feasible in a large class or a class that scheduled multiple exams. Nevertheless, they are useful monitoring methods on rare occasions.

In order to achieve results similar to the face-to-face examination setting in a traditional classroom without the large time commitment for the instructor, the instructors examined the options available with online companies providing some type of monitoring service. The online companies provide the service with either the college paying the exam cost or the students paying for each exam. After an initial trial period with one unnamed service used by the authors’ university, the authors and other instructors at the authors’ university who desire a proctored exam now require the online students to pay for the proctoring of each exam taken during that course. As long as an exam’s time frame is clearly stated in the course syllabus, the student is incentivized to make smarter choices about scheduling his time to take an exam with the proctoring service.

The authors have first-hand experience with the use of two different companies offering online exam proctoring services. Both companies took similar steps to ensure the integrity of the student’s testing environment and the use of the actual exam taken. As a general overview of the proctoring system, the process begins with the instructor logging into the proctoring service’s website and creating the settings for administering a new exam including the window during which the exam must be taken by students. The instructor then notifies his students that an exam window has been established. The student logs into the proctoring service, locates the appropriate exam schedule for his course, and selects a period of time that falls within the instructor’s established exam window. In the authors’ experience, the proctoring service charges each student a flat fee based on the length of the exam and the requirement that the student set his exam time at least 72 hours in advance. The closer in time to the exam a student waits to register, the higher his exam proctoring fee will be. A student is able to take an exam with no prior registration; however, that student will pay a higher fee for the proctoring service.

The current service has been used for two years and has relieved anxiety on behalf of faculty that wish to provide an online opportunity but at the same time make it close an online opportunity but at the same time make it close to a classroom testing experience. While the university is satisfied with the current service, it has considered other proctoring services for the purpose of determining additional safeguards that can be added to increase the integrity and consistency of students’ testing environments. The instructors at their university are still seeking technology methods to prevent the creation of an electronic copy of an exam administered online. The authors hope to share ideas on a successful outcome to this issue in the near future.

Formed that while the identification picture and the person presenting that identification card appeared to be the same person, the proctor had reason to believe the person attempting to take the exam was not the student enrolled in the course. This belief was based on the student’s inability to answer some basic questions about himself to which the student should have known the answers. The result of the incident was resolved in favor of the student, but the university administrators were impressed with the extra level of attention the proctoring service provided in verifying the student’s identity.

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