

IMPEDING STUDENTS' EFFORTS TO CHEAT IN ONLINE CLASSES

Paula Hearn Moore

Associate Professor of Accounting
College of Business and Global Affairs
The University of Tennessee at Martin
Martin, Tennessee

J. Derrick Head

Director of Online Studies
The University of Tennessee at Martin
Martin, Tennessee

Richard B. Griffin

Professor of Accounting
College of Business and Global Affairs
The University of Tennessee at Martin
Martin, Tennessee

ABSTRACT

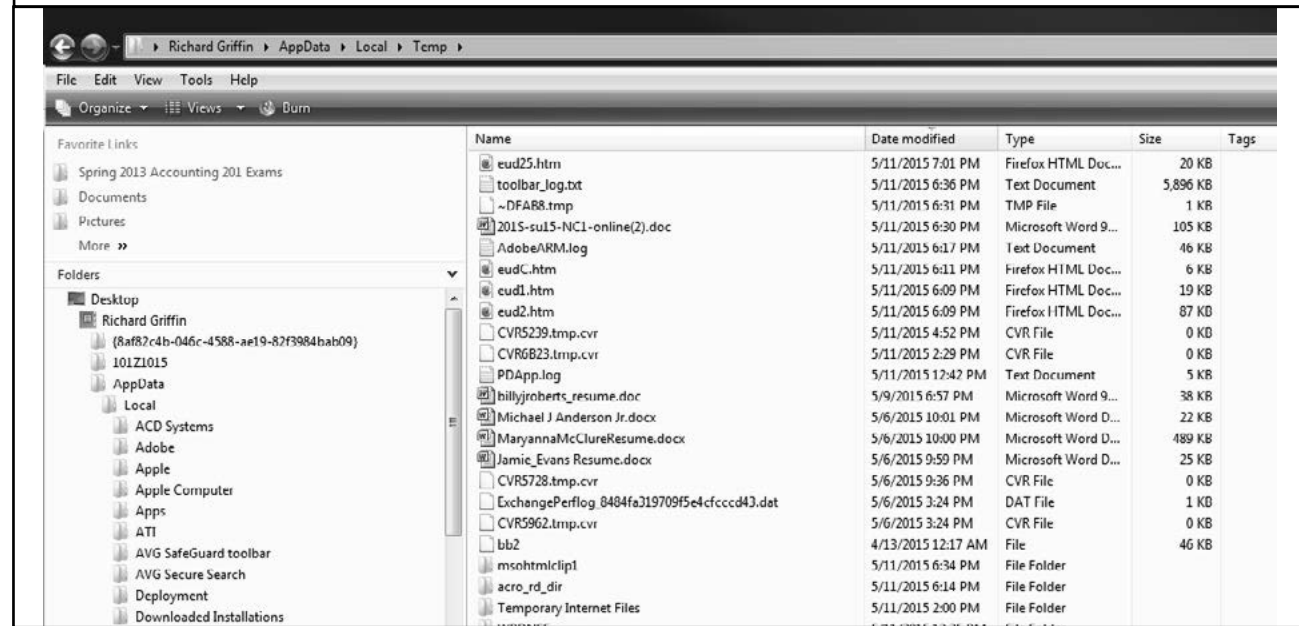
This paper identifies several methods a student could use to cheat while enrolled in an online course. Problems encountered in conducting an online course and in administering an online exam involve: (1) identifying the test taker, (2) preventing the theft of the exam, (3) combating the unauthorized 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

**ILLUSTRATION 1
UNINTENTIONAL OR INVOLUNTARY COPYING OF DOCUMENTS BY A DOS COMPUTER**



a student taking an exam, the instructor should examine the student's computer directory in order to determine whether the exam has been copied in whole or in part and, if necessary, take steps to remove all downloaded copies of the exam including the computer's Recycle Bin which will store a deleted copy of a document until it is removed from the Recycle Bin.

A student taking either a face-to-face or an online class has the capability to take pictures of exams with a cell phone, tablet, and other device. One of the authors had a student in class during Spring Semester of 2015 who had a scanner built into the end of the student's ballpoint pen with the capability to copy anything slid under the tip of the pen. Luckily, this device only had the capability to copy one line at a time. For an online student, the computer allows screen capture to make a copy of the exam.

Even if an exam is open book and open note, exam security is a problem. Instructors do not want one student to pass on a copy of the exam to any other student who is going to take the exam later in the online testing window (assuming everyone is not taking the exam at the same time). 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.

Preparing Online Exams and Exam Setup

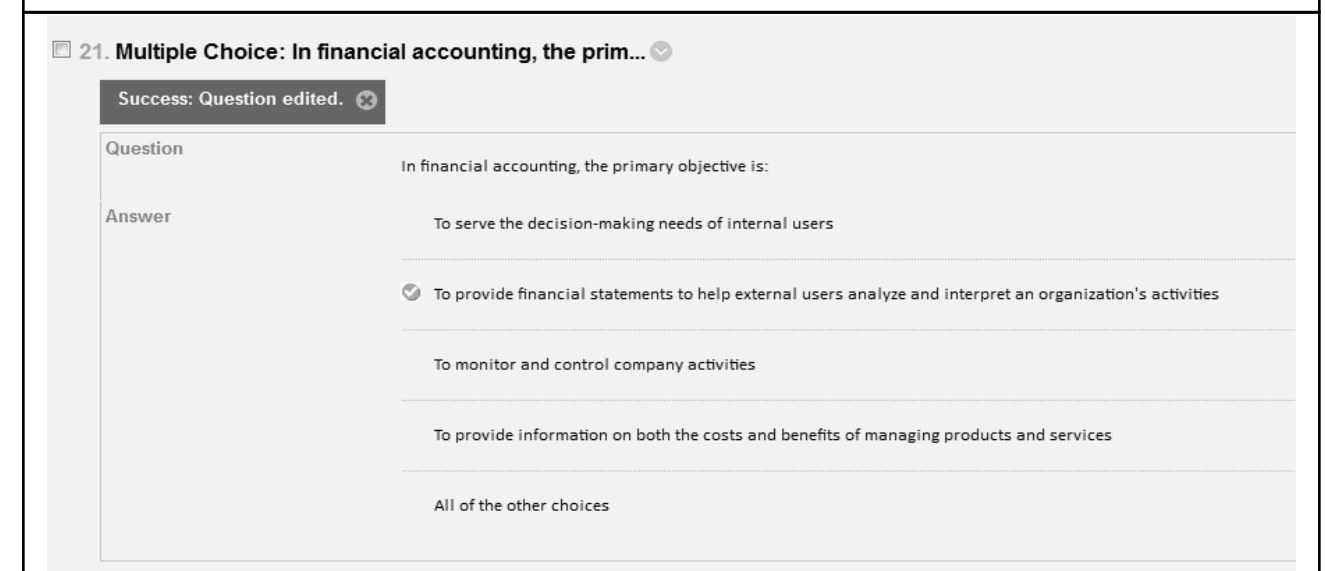
If properly performed, the preparation of the exam and the platform on which it is to be administered can help reduce the sharing of exam content information. At least some research exists to indicate that the environment (online or face-to-face) in which a student takes an exam does not impact his likelihood 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 a testing environment where Student X and Student Y are (1) taking the exam at the same time, (2) answering the same question at the same time, and (3) communicating with each other due to lack of proctoring, how would Student X reply to Student Y if asked by Student Y for the correct answer to question 21? Student X

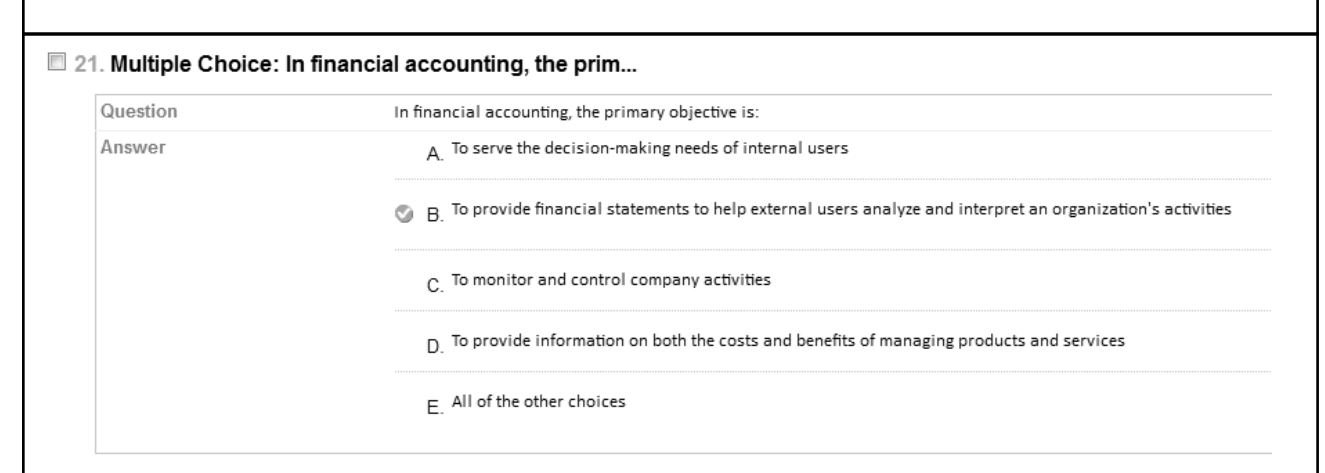
would reply "To provide financial statements to ..." as the answer. This communication by Student X would enable Student Y to take advantage of the correct answer. By taking two (2) steps, an instructor can reduce the effectiveness of the conversation between the students. The first step is to add a number or letter indicator to the beginning of each answer as shown in Illustration 3.

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 presented to each student so that answer listed as "B" for Student X is very likely to be different than the answer listed as "B" for Student Y. If the answers to question 21 are in a different order on both exams, the order would

**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.

**ILLUSTRATION 4
MULTIPLE CHOICE QUESTION
PLATFORM OPTIONS**

Answer Numbering	Uppercase Letters (A, B, C) ▼
Answer Orientation	Vertical ▼
Allow Partial Credit	<input type="checkbox"/>
Show Answers in Random Order	<input checked="" type="checkbox"/>

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 Letter (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 for a particular question are different in order to allow the maximum number of possibilities on how the answers are presented for this individual question on each student's exams. Checking this box does not randomize the questions within the exam, checking will just randomize the order of the answers within each individual question for which it is checked.

Platform options for administering an online exam are covered using Illustrations 5, 6, 7 and 8.

With reference to Illustration 5, the instructor should note the option of "Open test in new window."

Good reasons may exist for allowing this option but the authors chose "no" which will not allow the student the option of opening the test with a new window for the reason demonstrated in Illustration 6.

**ILLUSTRATION 5
TEST INFORMATION OPTIONS FOR
ADMINISTRING ONLINE EXAMS**

Open test in new window Yes No

If allowed, a student using a pc computer could hold down the "Alt" key and simultaneously the "Tab" key and be able to switch to another screen. Of course, the student could also take this action unless the instructor uses some means to prevent its occurrence such as a locked browser.

Blackboard also allows "Test Availability" options to be selected by an instructor as seen in Illustration 7 where 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., not check the "Multiple Attempts" box) and inform the students that any computer difficulties should be immediately reported to the instructor so that the difficulty can be properly documented and appropriately addressed. If, after examining the situation, the instructor is convinced that a genuine computer technical difficulty occurred with no involvement by the student, the instructor can erase the attempt and allow the student to restart the exam from an appropriate point (see additional discussion in a subsequent section below). This approach allows for a greater degree of accountability by the student and a greater amount of oversight by the instructor.

The fifth option presented in Illustration 7's "Test Availability" section allows for "Force Completion." An instructor who checks the "Force Completion" box would force the completion of the exam by a student during one sitting. In other words, the student would not be allowed to begin the exam, answer a portion of the exam questions, exit the exam, and return to the exam to finish the unanswered portions at a later point in time.

**ILLUSTRATION 6
SECURITY ISSUE FOR OPENING TEST IN NEW WINDOW WHEN ADMINISTERING ONLINE EXAMS**

Preview Test: Acct201_Exam1_Spring 2015-Chapters (1 - 3)

Test Information

Description: You are allowed 90 minutes. This is a test and not an exercise in how quickly you can look up the answers. Be sure you have read the chapters and know the definitions of all the terms at the questions and 5 matching questions. Also, there will be problems in which you need to understand the accounting equation and be able to make journal entries. For the multiple choice questions, questions are given one at a time and you are not allowed to go back once you have gone to the next question. You can skip a question but cannot return to it. The computer is suppose to shut down the exam at the end of the 90 minutes.

Instructions: This test has a time limit of 1 hour and 30 minutes. You will be notified when time expires, and you may continue or submit. Warnings appear when half the time has elapsed.

Timed Test: This test allows 4 attempts.

Multiple Attempts: This test allows 4 attempts.

Force Completion: Once started, this test must be completed.

Completion: This test does not allow backtracking.

Question Completion Status: Question 1 Question 2 Question 3

Question 2

The collection of all accounts (with account balances) used by a business is referred to as:

A. Ledger
 B. Book of original entry
 C. Chart of Accounts
 D. General Journal
 E. Journal

**ILLUSTRATION 7
TEST AVAILABILITY OPTIONS FOR
ADMINISTERING ONLINE EXAMS**

TEST AVAILABILITY

Make the link available Yes No

Add a new announcement for this test Yes No

Multiple Attempts
 Allow Unlimited Attempts
 Number of Attempts

Score attempts using ▼

Force Completion

Set Timer
 Minutes
 Auto-Submit OFF ON

Display After

Display Until

Password

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 a 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. When 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.

ILLUSTRATION 8
TEST PRESENTATION OPTIONS FOR ADMINISTERING ONLINE EXAMS

<input type="radio"/> All at Once <i>Present the entire test on one screen.</i>	<input checked="" type="radio"/> One at a Time <i>Present one question at a time.</i>
<input type="checkbox"/> Randomize Questions <i>Randomize questions for each test attempt.</i>	<input checked="" type="checkbox"/> Prohibit Backtracking <i>Prevent changing the answer to a question that has already been submitted.</i>

ILLUSTRATION 9
SHOW TEST RESULTS AND FEEDBACK TO STUDENTS
OPTIONS FOR ADMINISTERING ONLINE EXAMS

When	Score per Question	Answers	Feedback	Show Incorrect Questions
After Availability End Date 05/01/2016 11:59 PM	<input checked="" type="checkbox"/>	<input type="checkbox"/> All Answers <input type="checkbox"/> Correct <input type="checkbox"/> Submitted	<input type="checkbox"/>	<input type="checkbox"/>
After Attempts are graded Test results and feedback will be available to students after all students enrolled into the course are graded.	<input type="checkbox"/>	<input type="checkbox"/> All Answers <input type="checkbox"/> Correct <input type="checkbox"/> Submitted	<input type="checkbox"/>	<input type="checkbox"/>

ILLUSTRATION 10
INSERTION OF ESSAY QUESTION REQUIRING INSTRUCTOR INPUT
BEFORE AN EXAM GRADE CAN BE CALCULATED

45. Essay: Curve on Exam Do not answer any questi... Points: 0 (Extra Credit)

Question	Curve on Exam
Answer	Do not answer any question in the space provided for an answer to this question. Just submit it.

ILLUSTRATION 11
ADJUSTING POINTS ON AN INSTRUCTOR GRADED ESSAY QUESTION
BEFORE AN EXAM GRADE CAN BE CALCULATED

45. Essay: Curve on Exam Do not answer any questi... Update Points: 0 Extra Credit Cancel Submit

Question	Curve on Exam
Answer	Do not answer any question in the space provided for an answer to this question. Just submit it.

ILLUSTRATION 12
EBAY SEARCH FOR TEST BANKS

test bank All Categories

Related: test bank biology "test item file" nursing test instructor solutions manual test bank accounting nursing banks teacher resource book prentice test book

All Listings Auction Buy It Now Sort: Best Match View: [grid]

test bank 797 listings Follow this search

<p>Test Bank to accompany David G. ... \$40.00 or Best Offer</p>	<p>Economics Today: The Macro View... \$40.00 or Best Offer</p>	<p>McDougal Littell GEOMETRY 1990... \$14.00 1 bid</p>	<p>Teaching Textbooks Algebra 1 - an... \$59.99 Buy It Now</p>
<p>1998 Math Trigonometry Graphs a... \$5.65 \$6.95</p>	<p>Algebra 2 Answer Key & Test Bank ... \$4.99 Buy It Now</p>	<p>Teaching Textbooks Geometry ans... \$59.99 Buy It Now</p>	<p>Operations Management TEST BANK \$9.99 or Best Offer</p>

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 show 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 and 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.

ILLUSTRATION 13 SAMPLE TRUE/FALSE QUESTIONS FOR AN ELECTRONIC TEST BANK		
<input type="checkbox"/>	A wholesaler is an intermediary that buys products from manufacturers or othe...	True/False
<input type="checkbox"/>	A retailer is an intermediary that buys products from manufacturers and sells...	True/False
<input type="checkbox"/>	Cost of goods sold represents the cost of buying and preparing merchandise fo...	True/False
<input type="checkbox"/>	A company had sales of \$350,000 and cost of goods sold of \$200,000. Its gross...	True/False
<input type="checkbox"/>	A company had net sales of \$545,000 and cost of goods sold of \$345,000. Its g...	True/False
<input type="checkbox"/>	A company had a gross profit of \$300,000 based on sales of \$400,000. Its cost...	True/False
<input type="checkbox"/>	A merchandising company's operating cycle begins with the sale of merchandise...	True/False
<input type="checkbox"/>	Merchandise inventory is reported in the long-term assets section of the bala...	True/False
<input type="checkbox"/>	Cash sales shorten the operating cycle for a merchandiser; credit purchases l...	True/False

ILLUSTRATION 14 SAMPLE MULTIPLE CHOICE QUESTIONS FOR AN ELECTRONIC TEST BANK		
<input type="checkbox"/>	A company ages its accounts receivables to determine its end of period adjust...	Multiple Choice
<input type="checkbox"/>	Electron borrowed \$75,000 cash from TechCom by signing a promissory note. Tec...	Multiple Choice
<input type="checkbox"/>	The amount due on the maturity date of a \$6,000, 60-day 8%, note receivable is:	Multiple Choice
<input type="checkbox"/>	Paoli Pizza bought \$5,000 worth of merchandise from TechCom and signed a 90-d...	Multiple Choice
<input type="checkbox"/>	MixRecording Studios purchased \$7,800 in electronic components from TechCom. ...	Multiple Choice
<input type="checkbox"/>	Wallah Company agreed to accept \$5,000 in cash along with an \$8,000, 90-day, ...	Multiple Choice

**ILLUSTRATION 15
GOOGLE SEARCH FOR TEST BANK QUESTION HAVING A PARTICULAR FACT PATTERN**

The screenshot shows a Google search interface with the query "wallah company agreed to accept". The search results include:

- Course Hero: "Wallah Company agreed to accept \$3,000 in cash along with an \$8000, 90-day, 11% note from customer Judith Taylor to settle her ..." (Rating: 5 - 1 review)
- Chegg.com: "Wallah Company Agreed To Accept \$5,000 In Cash ... | Chegg.com" (Answer to Wallah Company agreed to accept \$5000 in cash along with an \$8000, 90-day, 13.5% note from customer Judith Klemper to ...)
- Wikiqus.com: "Wallah Company agreed to accept \$5,000 in cash along with an \$8,000, 90-day, 13.5% note from customer Judith Klemper to settle her ..."

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 testbank. For additional safeguards, the authors could alter one or more of the numbers contained

ILLUSTRATION 16
SAMPLE WEBSITE OFFERING ANSWERS TO OBJECTIVE TEST BANK QUESTIONS

WIKIQUIS
Answers to Questions

Accounting (8,941)
Finance (3,244)
Taxation (1,996)
Abnormal Psychology (1,461)
Mathematics (1,263)
Microeconomics (633)
Computer Science (527)
Business (1,583)
Decision Science (1,422)
Engineering (13)
Work Design (8)
Industrial Engineering (5)
Management (1,546)
Strategic Management (1,542)
Business Communications (3)

May 6, 2018

Wallah Company agreed to accept \$5,000 in cash along with an \$8,000, 90-day, 13.5% note from customer Judith Klemper to settle her \$13,000 past-due account. How should Wallah record this transaction?

Questions > Category: Accounting > Wallah Company agreed to accept \$5,000 in cash along with an \$8,000, 90-day, 13.5% note from customer Judith Klemper to settle her \$13,000 past-due account. How should Wallah record this transaction?

Wikipu asked 1 year ago

HashOcean
Cloud Mining
Want to try mining even now?
Payback Period 4-7 months
15 KH/s

Wallah Company agreed to accept \$5,000 in cash along with an \$8,000, 90-day, 13.5% note from customer Judith Klemper to settle her \$13,000 past-due account. How should Wallah record this transaction?

A.
Accounts Receivable – J. Klemper 13,000
Note Receivable 8,000
Cash 5,000

B.
Note Receivable 8,000
Sales 8,000

C.
Cash 5,000
Note Receivable 8,000
Sales 13,000

D.
Cash 5,000
Note Receivable 8,000
Account Receivable – J. Klemper 13,000

E.
Sales 13,000
Note Receivable 8,000
Cash 5,000

Answer: D

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.

ILLUSTRATION 17
SAMPLE ESSAY AND FILL IN THE BLANK QUESTIONS FOR AN ELECTRONIC TEST BANK

<input type="checkbox"/>	Each December 31, Davis Company ages its accounts receivable to determine the...	Essay
<input type="checkbox"/>	A company that uses the allowance method to account for its bad debts had cre...	Essay
<input type="checkbox"/>	The following series of transactions occurred during 2009 and 2010 when Linwo...	Essay
<input type="checkbox"/>	Prepare general journal entries for the following transactions of Viking Comp...	Essay
<input type="checkbox"/>	Cairo Co. uses the allowance method of accounting for uncollectible accounts....	Essay
<input type="checkbox"/>	Prepare general journal entries for the following transactions of this compan...	Essay
<input type="checkbox"/>	A supplementary record created to maintain a separate account for each custom...	Fill in the Blank
<input type="checkbox"/>	A _____ is a signed promise to pay a specified amount of money...	Fill in the Blank

ILLUSTRATION 18
DISPLAY OF ENTIRE FIRST QUESTION SHOWN IN ILLUSTRATION 17

Details: Essay Question

Question	Each December 31, Davis Company ages its accounts receivable to determine the amount of its adjustment for bad debts. At the end of the current year, management estimated that \$16,900 of the accounts receivable balances would be uncollectible. The Allowance for Doubtful Accounts account had a debit balance of \$3,200 before any year-end adjustment for bad debts. Prepare the adjusting journal entry that Davis Company should make on December 31, of the current year, to estimate bad debts expense.		
Answer	Dec. 31	Bad Debts Expense	20,100
		Allowance for Doubtful Accounts	20,100
		Desired balance in allowance account:	\$16,900 credit
		Current balance in allowance account:	3,200 debit
		Adjustment to allowance account:	\$20,100 credit

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 determine 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 in-

structor 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. Illustration 19 is a screen shot of Blackboard's "Test Information" screen for an actual student's attempt on a 50 question exam created by one of the authors during which the student's computer crashed on three (3) separate attempts.

The section entitled "Started Date" has a box to the right labeled "Access Log." By clicking on the "Access Log" box, the instructor can view a log of all the questions viewed by the student, the time into test that the student first accessed the question (in the next to last column from the left), and the amount of time the student viewed the question (last column on the left), the last part of which can be seen in Illustration 20.

In the above illustration, the student did not reach question 45. The student's computer crashed after saving the work for Question #44. The student was allowed another attempt and told by the instructor to skip all questions

**ILLUSTRATION 19
ONLINE TEACHING PLATFORM TEST INFORMATION**

Test Information

Current Grade 80.0 out of 100 points
Grade based on Last Evaluated Attempt

Status Completed

Attempt Score 80 out of 100 points

Time Elapsed No data

Started Date 3/15/15 6:50 PM Access Log

Submitted Date 3/15/15 7:33 PM

Clear Attempt Click **Clear Attempt** to clear this user's attempt.

Edit Test Click **Edit Test** to make changes.

Attempt History

- Attempt #1 (You are viewing this attempt)
- + Attempt #2
- + Attempt #3
- + Attempt #4

Instructions Choose the best response.

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 question 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 in-

structor'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 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

**ILLUSTRATION 20
ONLINE TEACHING PLATFORM TEST INFORMATION'S ACCESS LOG**

3/15/15 7:09:12 PM	Saved question 39	18:15	00:15
3/15/15 7:09:43 PM	Saved question 40	18:46	00:31
3/15/15 7:13:06 PM	Saved question 41 multiple times over a period of: 02:38	22:09	03:22
3/15/15 7:16:53 PM	Saved question 42 multiple times over a period of: 02:45	25:56	03:46
3/15/15 7:23:58 PM	Saved question 43 multiple times over a period of: 06:44	33:01	07:05
3/15/15 7:25:59 PM	Saved question 44 multiple times over a period of: 00:39	35:02	02:01
3/15/15 7:33:47 PM	Test submitted	42:50	07:47

*The times appearing under the Time Spent column may not accurately represent the time the student spent on each question. The student may have looked at other questions before answering and saving individual questions.

**ILLUSTRATION 21
ONLINE TEACHING PLATFORM TEST INFORMATION'S ACCESS LOG (LAST ATTEMPT)**

Access Log

The Test Time column shows times relative to the start of the test and the Time Spent column shows the time between the current Access Type and the previous Access Type. Time format is: mm:ss.

Date and Time	Access Type	Test Time	Time Spent*
3/15/15 10:55:49 PM	Test started	00:00	00:00
3/15/15 10:59:26 PM	Saved question 42	03:37	03:37
3/15/15 10:59:31 PM	Saved question 43	03:42	00:04
3/15/15 10:59:36 PM	Saved question 44	03:47	00:05
3/15/15 11:02:01 PM	Saved question 45 multiple times over a period of: 02:14	06:12	02:25
3/15/15 11:03:02 PM	Saved question 46 multiple times over a period of: 00:50	07:13	01:00
3/15/15 11:06:20 PM	Saved question 47	10:31	03:18
3/15/15 11:09:19 PM	Saved question 48 multiple times over a period of: 02:17	13:30	02:58
3/15/15 11:10:17 PM	Test submitted	14:28	00:57
3/15/15 11:10:17 PM	Saved question 49	14:28	00:00

*The times appearing under the Time Spent column may not accurately represent the time the student spent on each question. The student may have looked at other questions before answering and saving individual questions.

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. Some faculty members allow students to take an exam at a satellite campus office or to find their own proctors. These testing options raises questions about maintaining the integrity of the exam and/or the proctor and about the logistics of providing and retrieving the exam in a timely manner (Young, 2013).

The authors began using online proctoring for an online course in an effort to eliminate or reduce the instances of cheating on an online exam (Harmon, 2008). Several companies offer proctoring services. The following list is not exhaustive but are one the authors have actually used, considered, or are considering. Their list consists of Re-

spondus 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 integrity 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.

When the time arrives to take the exam, the student signs into the proctoring service website being sure to have handy access to his government issued photo identification, a good internet connection, a web cam, a microphone, and any notes or materials he is allowed to access during the exam. The monitoring service will determine the identity of the student by comparing the student's government issued identification card or document with the

person shown on the web cam who is attempting to take the exam. A picture of each is taken by the webcam for future comparison should a question arise at a later date. Those pictures are also available for the faculty to view after the exam is taken. The proctoring service will then verify the upload and download speed of the student's internet connection to ensure sufficient capacity exists for taking the exam. The student is then required to use his web cam to provide the proctor a 360-degree view of the room where the exam will be taken including the ceiling above the computer, the floor below the computer, the left and right sides of the desk, and the area behind the computer. When the student's testing environment has been verified as being free from obvious signs of unauthorized individuals and material, the proctoring service will ask the student to access the exam site and will take control of the student's computer in order to enter the exam's password which has been provided to the proctoring service but has not been provided to the student.

Two main differences between the prior and the current proctoring services were noticed by the authors. The first difference relates to the type of proctoring performed by each service. The prior proctoring service used the student's web cam to film the student taking the exam. That same service also used the student's computer to capture key strokes and screen shots every few seconds with no one monitoring the exam while it was given but with several employees reviewing data after the completion of the exam. That information was also made available for the instructor to review. The current proctoring service used by the authors' university uses a designated proctor to monitor the exam. The exam itself is not videoed. Instead, the proctor uses the student's web cam to take pictures at regular intervals to document the exam environment. If a student experiences a computer crash during the exam, the proctor stays in contact with the student and attempts to contact the instructor to explain the problem encountered. The instructor is given an opportunity to offer suggestions (if any) or to allow additional leeway in restarting a section of the exam. In the event an ethical issue or a other point of concern surfaces during the administration of the exam, the proctor service notifies the instructor at times previously selected by the instructor to receive that information which can include an immediate notification if so desired by the instructor.

The second difference is the steps taken to verify the identity of the student who is attempting to take the exam. While both services compared government issued photo identification cards to the student taking the exam, the current service takes an additional step in asking some basic questions of the student to which answers should be readily available. For example, one of the author was recently contacted by the current proctoring service and in-

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 final 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.

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 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 authors and other instructors at their university are still seek 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.

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