Cyber Cheating Challenges in Web-based Courses

JoDell K. Steuver and Nathan W. Harter
Purdue University, School of Technology, Columbus

The Nature of the Problem
Technology raises some new challenges, but it also returns some old challenges in a new context. Fortunately, technology often eventually solves many of these same challenges, but that is not always the case. Besides, there is probably a time delay between the emergence of a problem and its resolution by technology.

Online learning raises fears of new and increasing opportunities for academic dishonesty. This fear is confirmed to some extent by studies that reveal students’ admissions that cheating is common.\(^1\) Research in both the United States and Great Britain confirms that about fifty percent of college students admit to cheating.\(^2\)

Online learning forces instructors to deal with new practical issues. Web-based courses take teaching to new levels as the profession wrestles with authentication of students’ work, proxy students, instant messaging during exams, computer security, electronic forgery and other novelties. It is not obvious that technology to stop cheating will keep pace with technology to cheat, and the legal and ethical constraint on using it obviously will not deter cheaters.

Sophocles said, “No treaty is ever an impediment to a cheat.”\(^3\) Many instructors fear that no technology or student contract is ever an impediment to a cheat. Rather than rely on technology to solve problems associated with technology, instructors need a variety of strategies to prevent, detect, and if necessary correct cyber cheating. And time is a factor, because student proficiency often already outstrips instructor proficiency, and because technology changes so rapidly that an instructor can find himself hopelessly at a disadvantage. Making matters worse, conscientious instructors are constrained by issues of legality and fairness—constraints that a cheater obviously ignores.

Prevention Strategies
Many instructors admit that they have ignored cheating. "The most often cited reasons include a concern that the evidence was not airtight, overwhelming stress and anger, an unwillingness to endure an arduous formal hearing, and concerns about retaliation," according to Patricia Keith-Spiegel of Ball State University.\(^4\) Cheating will not be controlled if instructors won’t control it. Instructors who use electronic technology must become assertive and unabashed in their confrontations over cheating.

Prevention might include the use of technology, but often times the low-tech approach is most effective. Transmitting class norms becomes a girder in building the course. Explicitly outlining clear, high expectations continues as part of the relationship building between student and teacher. It is necessary to spell out the unacceptable behaviors for test taking and homework. Tell students if they may not use hand-held computers, PDA’s, chat tools, instant messaging, and cell phones nor have other students in the class present when they are taking their tests, and list the tools and resources that will be permitted for problem solving.\(^5\)

Students will cheat to catch up if they do not start at the same pace as others in the class. One of the surprises is that even in a school based on technology, not all students or instructors are great at using computers. Encouraging students to look at some basic tools through bonus points is also a great way to find out who might need some additional help using the computer. Some of the most frequently encountered problems were based in transferring files—saving files, attaching files, and formatting files. It helps to have a location-based person that an on-line student can work with to improve these skills. Developing tutorials through print-screen pasting into documents has also worked.
Students admit that cheating is often the result of procrastination. Those who use papers or essays as part of course requirements should ask students to turn in electronic drafts at intervals. Deadlines are important to keep students honest and on track. Completion of smaller pieces of work makes a large project more feasible without cheating.

Many instructors have warned that it is important to revise tests frequently and have several versions available. Web courseware allows for test questions to be selected randomly, so that several test versions can be created easily. Instructors can monitor test beginning and submission times for collaborators using the authoring software. There is another approach used 40 years ago at a mid-western university. The tests were so incredibly hard, that even selling last year’s final through the local bookstore didn’t benefit students much. It did recover the department’s printing costs.

Detection Strategies
When does collusion overtake collaboration? Take this example: investment in plagiarism-detection software is growing, while the volume of available electronic resources to plagiarize continues to grow. That is one problem. Student consent for reasonable processing and storage of their written materials may further complicate the use of detection software. Some attorneys have stated that using a student’s paper with detection software is not an infringement because it is protecting the student from others who might steal content. Others argue that it isn’t ethical for these software companies to collect student materials to build databases for detection services that are then sold to educational institutions.

Many faculty members are talking about electronic means to assist in detecting plagiarism. The United Kingdom piloted electronic plagiarism detection software through www.turnitin.com. Students had to submit a permission form to participate in the pilot of on-line submission of papers. The software checks for duplicate sources of information. Instructors are still required to evaluate the information and sources to determine if the particular use constitutes plagiarism. One of the debated features of this system is that the software company uses the students’ works to continue to build their own database.

"Changing values of authorship, new opportunities for collaboration, and improved, easily accessible information technologies…make it difficult if not impossible to assess student writing and research practices via conventional standards for plagiarism." There are several services available to check student papers for copied content, including the simple use of a meta-search engine to check content from a middle section of a paper. A colleague recommends this search technique because her experience is that students typically write their own introductions.

Employed students who develop material in conjunction with their employer may have ownership issues that present a challenge to using detection software. In addition availability of good detection software does not solve the problem of “recycling” papers—using an old paper the student did write with adaptations for a different class. Will the institution use the software to scare and deter cheaters, or will they punish those caught cheating? Some may find that use of software levels the playing field, if the institution enforces sanctions against those who plagiarize.

How the software results could be used raises legitimate student privacy concerns. Will the identification of plagiarized materials begin a private conversation between instructor and student? A general class announcement of rampant cheating and refusal to accept certain students’ work may violate their privacy. One teacher says that he has had success with revealing his suspicions and giving the student a chance to prove that the work is not plagiarized.

The instructor’s experience with web-based instruction is likely to be different from the student’s experience. Planning for a web-based course requires discipline and good design on the part of the instructor. Instructors are forced to anticipate different kinds of learners, different course objectives, and different measures of learning. Teaching on the web forces instructors to develop a map or framework for an integrated plan of activities, exchanges of information, and assessment. A course authoring tool took much more time preparation than a face-to-face class, at least initially.
The electronic test tools are time savers once they are configured properly. It took a great deal of time to learn to set the timers and randomize questions from the database. The online manual has been a good resource, and the test section is now clipped near the workstation because it is the one feature that is not used as frequently as the others. It can be difficult to estimate how much time students would need to complete an electronic exam. The advantage of using test tools is that the software allows the instructor to see individual and group performance in a variety of ways to spot outliers who might be cheating.

One thing instructors can do with course authoring tools is set up a student account for themselves using an alias to see the student view of the courseware. The account helps the instructor to see if items are working as they should from a student’s perspective, and to troubleshoot problems. It also allows the instructor to monitor communications among students. Barbara Christie was told of an instructor who as a fake student discovered a student e-mailing an answer to an assignment to all the other students.12

No matter what the subject area, it is important to know the student’s abilities. Assign a writing sample early in the course to identify individual writing styles or a math problem to identify problem-solving skills. Using an agreed upon format or style guide for departmental assignments can help instructors to identify papers that came from writing services. If the department chooses to use the APA style, for instance, then faculty members should agree to continue to use it for on-line courses, too.

Informing students that teachers have special viewing privileges in authoring software may also deter cheating. It seems fair to warn students that their instructor can tell what they have accessed on the website. There does seem to be a clear link to student success and frequent use of resources posted on the course web page. It is one way that an instructor can tell that the student is “participating” in class. Students who do not check e-mail frequently may find that they have missed critical information and will be tempted to cheat to catch up.

Incentives to participate in on-line discussion seem to work to involve students in the class and to identify imposters. If the student does not want to reveal personal information, he may be more inclined to participate in a topic-based discussion. This initial writing sample gathered through the discussion tool also gives the instructor a base-line to evaluate grammar, spelling, phrasing and general knowledge—some individual identifiers than can be used to collect and compare writing samples for originality. While voice, thumbprint, and iris recognition are rapidly developing technologies, college budgets make writing samples a better way to authenticate student work.

An example of this first sample: “I am currently employed at Marriott Hotel. I just got in a horrible car accident 2 weeks ago, and i am in the process of recovery. I believe this class will be very beneficial to me so i am excited!” A later sample from the same student: “As a first step to improve her work station to fit more ergonomic friendly, they can redesign the work station( table) so it would allow her to have enough room to operate her duties without worrying about moving or stacking up. her tall height is making her neck and shoulder very painful, they can improve the table to right angle she feels comfortable, and having a hard floor and spending all day during work hour may cause painful feet and as well as back pain.” The language patterns are similar and the lack of articles and capitalization is similar. I believe the latter to be the actual work of this student based on the first writing sample.

A recent study used a variety of criteria to evaluate online messages. Messages were examined for evidence that the students had completed readings—another clue to student authenticity. Comments that moved the discussion forward, well elaborated and logical points, and reflective or creative thoughts were scored. The Oriogon and Cook study also looked for students who acknowledged the comments of others in the discussion and who were appropriate in discussion etiquette. The participation and interaction variables were coded and scored and interaction in the realm of conflict resolution was monitored.13 The researchers found the coding very time consuming and admit that they wouldn’t recommend this approach for others. Their research prompts instructors to consider messaging as a tool to evaluate the quality and value of student interaction. Messaging also can provide evidence that students have done their own homework.

The relationships that allow the instructor to detect cheating in the face-to-face learning environment, can also serve as a smoke detector on-line. On-line teaching has the potential to foster an anonymous, disinterested participant.
Students who avoid interaction on-line raise suspicion when they turn in superlative projects. Experiences over time have shown that students who are engaged in learning learn better. Individual investment in a web-based course is one part of engagement. Interaction with others in class is its corollary.

Test software can limit IP addresses for test taking, set a time to log in, set a time to take the test, control the number of tries permitted, and can hold release of scores until all have taken the test. These features are used to control who can take a test. The test databases can be scrambled randomly to generate any number of tests, so that no two students are answering the same question at the same time.

Time limits can prevent students from looking up answers in the sense that a student cannot possible finish a test if he looks up answers. Control features allow items to be released for viewing one item at a time or allow the student to see the test in its entirety. If the test is designed with the release feature using one question at a time, instructors need to build in additional time for questions to load. Students who use 56K lines to take exams will find the individual release option frustrating.

The test-generating tools work better with short answer, multiple-choice, true-false or matching questions. They are great for quizzes, but they may not provide enough information about what a student really knows. In some cases, it is even more important to understand what a student did not understand. The graphing tools with the quiz features can identify questions that were missed by many students and responses to items can also be compared for collusion.

Essay exams have a wonderful potential to reduce or even eliminate cheating. The instructor pays the price in the end because of the time required to grade exams. At least one essay exam in smaller classes can help to highlight missed concepts and verify originality of thinking. The essay or short answer questions can be combined with multiple-choice questions using the web-authoring system, but they must be individually graded by the instructor.

Another option is to have exams monitored. Some locations use web cams to watch students taking tests. This option has been a good experience in some locations, and mediocre in others. The Indiana College Network does have a number of locations that can provide this service for on-line students. Students are typically asked to provide photo ID’s as well.

The classroom assessment techniques that Angelo and Cross have compiled can be adapted to use in the web-based environment. While Angelo and Cross collected replies on 3” x 5” cards or half sheets of paper, students can e-mail the same type of formative evaluation to the instructor. Angelo and Cross also used a voting technique to disclose information to the instructor, and this could easily be adapted to the quiz tool. The familiar “What are three things you learned this week about…?” can help the instructor to improve teaching and check student honesty.”

Formative mid-term evaluations have worked well using assignment tools. Students may prefer this option because the assignment tool can be configured to protect individual identities to some extent. While the instructor can see who has turned in an assignment, if the assignment is saved in a word format with a randomly assigned identifier, the student’s identity is protected. One drawback is that typically a numerical value must be set to an assignment.

Follow up with e-mail to check learning. Instructors have a wonderful opportunity to ask, “Why did you choose this process to solve the problem?” or “If you had to prioritize these items for action, which five would you choose?” These conversations can occur privately, and it should not take long to ascertain the student’s mastery of the content covered by the latest exam. The discussion features also allow professors to reply to a discussion item individually.

Correction Strategies
One reason that it is important to be honest is that the penalties for cheating can be quite severe. The web-based course should have a link to the university’s academic honesty policy, and instructors need to make students aware of the penalties. A dishonorable discharge from the university is a very real barrier to degree completion at any university.
Some instructors believe that the information taught in their courses can make a big difference in the student’s future career. It is important to let students know that the concepts taught in a particular class will enable him to succeed in future classes, licensure or work. Corporate sponsors might not pay for tuition if they knew that students were cheating in the course. They also might stop sending students to a particular program if it has a poor reputation. Taking corrective action as soon as a problem arises is in the best interest of the student, the university and the corporate sponsor.

Ball State University has developed a CD-ROM program for first-time cheaters. It is envisioned as working like classes for driving offenders. The program takes between three and eight hours to complete, and contains several multi-media clips. The offenders must pass quizzes to go on to the next section. It takes support from the entire university structure to attack pervasive cheating practices, and Ball State appears to have tackled cheating head-on with their awareness program and software.

Cyber cheating is part of a larger effort to understand and encourage computer ethics generally. It is not unreasonable to infer that students who get away with cheating will find it easier to do other unethical things in their personal lives or at work. By preventing, detecting and correcting cyber cheating, instructors help to curb temptations to commit other unethical acts. The primary concern of course is that academic dishonesty goes to the very purpose of the institution and for that reason alone instructors have an obligation to become savvy and stay current.

Conclusions
Students and corporate learning centers report that one reason they prefer web-based instruction is that it saves them time—time to travel to class, time taken by course administration and a commitment of a certain block of time in a specific place on a regular schedule. Learners can skip information that the already know, moving at their own pace. Both the businesses and the students see the time and cost correlations.

There is little doubt that web-based instruction will continue to grow. Colleges are moving to the world of on-demand access to learning resources, and the classroom has left the campus for the workplace and home. College instructors will be left little choice but to prepare for these changing demands. The best prevention is to be prepared for both cheating and increased demand for web-based instruction.

Many students expect that the web-based experience will be a way to earn credit for doing less than those in live classes do. Perhaps the best way to discredit web-based instruction is to allow this dream to become a reality for students. Students sitting in classrooms who perceive that web-based students in the same course had a less rigorous experience will be happy to destroy this alternative delivery system.

Corporate sponsors of web-based students have moved from asking, “Did they go to class?” to “What can they do?” On-line instruction has forced faculty members to answer this question. Purdue University’s School of Technology has offered seven different courses through their Organizational Leadership Department since 2002. This has made professors rethink and rewrite course objectives using behaviors that can be measured. Each lesson and activity has to build on the final goal—those behaviors that a student should be able to demonstrate upon successful completion of the on-line course. Technology challenges instructors to design courses that authenticate and verify student performance.

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http://online.northumbria.ac.uk/faculties/art/information_studies/Imri/Jisepas/docs/jisc/Pilot_final_report2.doc

http://english.ttu.edu/kairos/3.1/reviews/marsh/plagvalues.html


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Biography
JoDell K. Steuver is an associate professor in the Department of Organizational Leadership at Columbus, Indiana. She has been using WebCT to deliver courses for three years. She is currently teaching occupational safety and health in an on-line format. Her graduate work is in adult education and in health and safety management.

Nathan W. Harter, J. D., is an associate professor in the Department of Organizational Leadership at Columbus, where he teaches courses in leadership philosophy and ethics. He practiced law in Ohio County, Indiana, before joining the Purdue University faculty.

Appendix A – Technology Tools to Assist Teachers

Sites that can assist in a search for plagiarism:

Glatt Plagiarism Services, Inc.: http://www.plagiarism.com
Plagiarism.Org: http://plagiarism.org
Turnitin: http://www.turnitin.com

Meta search engines:

Go2net.Com: http://www.go2net.com/
IXQuick.Com: http://www.ixquick.com/
Mamma.Com: http://www.mamma.com/
Zworks.Com: http://www.zworks.com/

Some paper writing services:

4TermPapers.Com: http://www.4termpapers.com/term-papers_cw.html
ABC Research: http://www.abcresearch.com/
Anything Written.Com: http://www.anythingwritten.com
Essay Chief: http://EssayChief.com
LookSmart: http://www.looksmart.com
Specialty Research: http://specialtyresearch.com

Appendix B - Using Discussion to Collect Writing Samples

Sample of compiled discussion used to collect writing samples from students through a web authoring tool. This discussion has identified a couple of students who need to use spell check, several who are articulate, a person who will gather facts to support an argument, and a student who is succinct. This small sample also provides some feel for when students will be most likely to participate in discussion, which can help the instructor to facilitate or respond if need be.

Message no. 1 Posted by Jo on Thu Jan 1, 2004 11:38
Subject Anthrax and worker safety

My friend Kim works for the federal OSHA office in Washington, DC. Because of the anthrax threat, the postal service has implemented new processes for mail. Every piece of mail that goes to a federal agency is irradiated now. Kim says that it takes much longer for her to get mail, and some of it comes shriveled or damaged from the process. Kim has started telling people to mail things to her at home. She'll get them sooner, and they won't be damaged.
What do you think of Kim's idea?

Message no. 2 [Branch from no. 1] Posted by Linda on Fri Jan 2, 2004 13:49
Subject Re: Anthrax and worker safety
I don’t think it is a good idea. This process was put into place for her safety and by not following the process she is putting herself and her family, if applicable, in harms way. I know that she thinks she is helping those who need information from her to get it but other ways could be used, such as email, that would not endanger her.

Message no. 3 [Branch from no. 1] Posted by Jennifer on Fri Jan 2, 2004 20:07
Subject Re: Anthrax and worker safety
I think Kim is putting herself and others at risk and also violating the law!

Message no. 4 [Branch from no. 2] Posted by Eric on Fri Jan 2, 2004 20:13
Subject Re: Anthrax and worker safety
I agree with Linda. This process was put into place to protect the office workers and the postal workers. It is good to hear that Kim is wanting to get to her requests quickly but the consequences of not following directions could be severe (not only for her and her family but anyone that comes in contact with the letters.) Email would be a great idea for more pressing issues that need attention. The problem with that would be what is important to me (I'm not very patient) is not as important to someone else. Also, there could be double the work if she does not pay close attention to matching emails and letters.

Message no. 5 [Branch from no. 3] Posted by Ryan on Sat Jan 3, 2004 14:33
Subject Re: Anthrax and worker safety
I agree with everyone else. It is not worth the risk. With email and fax machines there is not any need for traditional mail when documents are involved. The traditional mail is only really needed for larger items.

Message no. 7 [Branch from no. 1] Posted by Jason on Wed Jan 7, 2004 09:02
Subject Re: Anthrax and worker safety With all the terrorism in today's world we need to understand that for a while simple every day tasks are going to be a burden. While things may take longer it is only for our own good. Everyone is inconvenienced by the mail having to be checked but think about it. Would you rather be inconvenienced by your mail taking longer and waiting longer in lines at numerous places due to security or stand the chance of being hurt or killed by a terrorist?

Message no. 8 [Branch from no. 7] Posted by Richard on Thu Jan 8, 2004 18:20
Subject Re: Anthrax and worker safety
I agree with all of you in some respects but, I also feel that if she wants to ask others to send mail directly to her home in order to get them quicker and undamaged then she should be able to do so. I am sure that she is smart enough not to have anything that should be screened sent around the system. Longer lines in airports for security are definitely something that we can all live with and I think that we can all agree on this. However, if someone wants to smuggle a bomb on an airplane it can still be done. If it couldn't then why would they have cancelled all of those Air France flights over the holidays and still be looking for the suspect. The same holds true with the mail. If she didn't have items being sent to her home and someone wanted to harm her by sending anthrax through the mail, I am sure that they could get around the current system in order to get it done. I hope that this wouldn't happen, but it is a reality.

Message no. 13 Posted by Helen on Sun Jan 11, 2004 10:55
Subject re: anthrax and worker safety
I have a couple of problems with Kim's behavior. First, mail that is addressed to the federal government belongs to the federal government and not to Kim. Having it delivered to her home is not an option that the federal government would offer her. Secondly, Kim must not be aware of the real dangers of Anthrax because if she were she would not put herself at risk not to mention all the other people that she is putting at risk! The biggest problem, however, is that I see with her behavior is concerning her attitude about what she is legally required to do based on the stipulations of

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her job. It is not up to her to "change the rules" there are reasons for those rules and although most seem obvious to us there is more to the story than Kim might know. This is the kind of thinking that makes well thought out safety and health plans ineffective. She is jeopardizing the effectiveness of what is probably a very expensive and extensive safety guideline.

Message no. 18[Branch from no. 15] Posted by Jason on Mon Jan 12, 2004 08:01
Subject Re: Anthrax and worker safety
With accepting mail at her own residence I totally agree that things can get lost in the confusion and she does not own that mail. But another reason she should not accept mail is because there is no way to protect yourself from anthrax. The cdc can only give you measures for protecting yourself when opening mail but there are no scientifically proven ways to prevent exposure. Anthrax is deadly and there is no reason to add that extra risk by business mail at home.

Message no. 19[Branch from no. 1] Posted by Lorelei on Mon Jan 12, 2004 10:48
Subject Re: Anthrax and worker safety
Having her mail sent directly to her house is a bad idea. She is putting herself and others in the house at risk of getting anthrax or possibly something else. It is not safe to have mail sent to her house if it supposed to be sent to a federal office. The process of checking the mail is to ensure her safety and she should realize that just because a package is damaged on the outside, it does not mean the content in the package is damaged. If a package is damaged it is better to have it that way then to have anthrax in her home.

Message no. 21[Branch from no. 6] Posted by Kyle on Mon Jan 12, 2004 19:15
Subject Re: Anthrax and worker safety
According to the U.S. Postal Service Emergenc

The U.S. Postal Service is working to design and build vacuum/filtration systems. The postal service is working with manufacturrs of irradiation technology but on a limited deployment to evaluate the operational impacts, costs and effects on mail and its contents. So no, I do not believe that there is a law that says the USPS hat to irradiate those letters. It has been put into place on a small scale for study because it is the only scientifically accepted means to decontaminate mail exposed to biohazards.