Online Cheating: A Prevention Procedure

Wasim A. AlHamdani, PhD
School of Computer and Information Sciences
University of the Cumberlands, Williamsburg, KY, 40769

Abstract – Online learning and online courses have become ever more popular and many educational institutions have adopted this learning method, as have many learners. Educators now face a challenge to prevent online cheating (E-cheating) or minimize it to keep the level of education high and honest. In this paper, a procedure and development process addresses the issues of online cheating. The procedure is based on developing a front-end control policy that is then integrated with back-end control.

Keywords: Online Cheating, Online Cheating Prevention, Online Course, Front-End Control, Online Course Back-End Control

1 Introduction

Online courses have become more popular, and many education colleges and universities have adopted this learning style in addition to in-class learning delivery within the past decade. The number of students in virtual classrooms has increased and opened new and extra opportunities for the future. In 2003-2004 the total of all distance education classes was 15.6 %; in 2007-2008 the total for distance education classes was 20.6 %, in 2011-2012, the total was 32.0%, and in fall 2014, the total enrollment in any distance education course(s) was 5,750,417 [1].

The first online course was offered during the 1700’s and generally called “correspondence courses” [2]. This type, of course, was based on sending the student course materials by post; exams were also post based (send the student the exams by post and the student returned the answers; other universities had their students go to a certain location to attend the exam. The University of Illinois developed an Intranet in 1960 for their students. It was linked to computer terminals where students could access their course resources as well as listen to recorded lectures [3]. In 1984, The Electronic University Network (EUN) was established, and it had the task of assisting universities to increase their availability of online courses, EUN presented its first online course in 1986 for DOS and Commodore 64 computers [3].

The history of online learning and education became more integrated with the Learning Management System (LMS) and Virtual Learning Environment (VLE). The learning management system (LMS) is application software used for documentation, administration, tracking, reporting, and delivery of educational courses or training programs [4]. This system could be:

- Centralize and automate administration
- Use self-service and self-guided services
- Assemble and deliver learning content rapidly
- Consolidate training initiatives on a scalable, web-based platform
- Support portability and standards
- Personalize content and enable knowledge re-use.

Whenever there is a learning process, there must be an assessment with an assessment wide diversity of tools or methods that educators can use to evaluate, calculate, measure, and document academic readiness, willingness, and learning progress, skill acquisition, or educational needs of their students. [5] Assessments are used for a wide range of purposes in schools, and thus, education systems and their assessments can come in many types:

- **High-stakes assessments** are typically standardized tests used for the purposes of accountability
- **Formative assessments** are in-process feedback focused on what students are learning or not learning, so the instructional approaches can be modified according to the desired assessment outcome.
- **Summative assessments** evaluate student learning for an instructional period on typically graded tests and assignments that conclude whether students have learned what they were expected to learn during the defined period of learning.
- **Interim assessments** evaluate students on their learning progress and determine whether they are on the correct path to perform well in future assessments
- **Placement assessments** “place” students into a course, course level, or academic program, and the basic purpose is to balance students with suitable learning experiences that address their distinct learning needs.
- **Screening assessments** conclude whether students may yet need essential dedicated assistance or services.

Many assessments in the literature have focused on the basic two types of assessments [6, 7, 8 &9]: **Formative Assessment and Summative Assessment**. However, the first of these could include the following processes:

- Observations during in-class activities;
- In-class activities

---

• Homework exercises
• Reflection journals that are reviewed periodically during the semester
• Question and answer sessions
• Conferences between the instructor and the student
• Student feedback

The second type of assessments could be any one of the following techniques:
• Examinations (major, high-stakes exams)
• Final examination (a truly summative assessment)
• Term papers
• Projects
• Portfolios
• Performance
• Student evaluation of the course (teaching effectiveness)
• Instructor self-evaluation

There are different types of E-assessments, some can be controlled by using plagiarizing techniques and software; the other types are selected based. The second type is the topic of this work, which presents previous techniques for online cheating (selection-based assessments).

The presented techniques are based on creating course policies that utilize assessment timing, assessment presentation, student responsibilities, and retaking tests. This work focuses on developing a guideline and a procedure for how to control online cheating and prevent such practices from being successful.

2 Assessment In an Online Environment

The principles of assessment are similar, nevertheless, i.e., whether one is teaching online or teaching face to face [10]:
• Assessments are associated with learning goals and objectives.
• A variety of assessment methods is used.
• The instructor has full responsibility for implementing any type of assessment.
• The instructor provides students with ongoing feedback.
• Learning goals and performance criteria are transparent to students by using essential questions and scoring rubrics.
• Results help close any learning gaps.
• Students are given an opportunity to reflect on and self-assess their learning.

Nevertheless, online learning presents both challenges and opportunities for assessment.

Challenges
• New Federal requirements for authenticating learning in an online environment. This is achieved by either on-site test taking or camera equipment that monitors students as they take their exams.
• Online instructors must provide digital feedback rather than handwritten feedback.

E-testing or online tests are often different types, and these can include:
• Multiple choice
• True/false and Yes/No questions
• Multiple selection or multiple responses
• Matching
• Sequencing/ordering
• Hotspot (users indicate the answer by clicking a specific area of an image)
• Judged mathematical expression
• Short answers
• Free Text response or Essay

An e-assessment can be classified into two types:
• Free text response (Based on writing) such as an essay, short answers, report, or research work
• Selection based, for example, on T/F, multiple choice, matching, sequencing/ordering, Hotspot and Judged mathematical expression

Each type has a control methodology to prevent online cheating; the first method can be achieved by using plagiarizing software. The second method (selection based) applies several techniques suggested, for example, “Tips for Preventing Online Cheating” [11]. These techniques (based on using Blackboard) suggest practices that can be used by the instructor:
• Mix Objective and Subjective Questions
• Use Question Pools
• Randomize Questions
• Limit Feedback
• Set Timer
• Display Questions One-at-a-Time

As we can see in the following diagram, the end, which is called the front end of a test, is when a student logs in to access the test or exams as shown below in Figure 1.

![Figure 1: An overview of E-cheating control methods](image)

The front-end process can be defined as the end user, and control will focus on control of end-user behavior when accessing an E-test. The back-end process is the instructor end where the E-test is created and generated, and E-test
options are set up. For front-end cheating, we have found the following cheating ways that students have actually used:

- **Cheating with Simultaneous Logins** [10]: Two learners at two different locations can log in into one student’s exam at the same time. Therefore the real student acts as the "dummy" while the remote person takes the exam on the remote person’s behalf.

- **Turn Location**: Keep machine information from appearing in the system; this works along the same line of thinking as above

- **Search for the Answer**: Simply copy the question and search for the answers; quite often the answers can be found on course hero (coursehero.com) or course documents (Blackboard course documents) or online textbook

- **Edit the Web Exam**: Some suggest (says) to edit the web page using developer tool and inspect.

- **Students claim they have a Network Problem**, or the system collapse or the system has a halt status in many cases (noticed this through using Blackboard for last 17 years); in this case a student will have extra time on the exam period, students can copy the questions and work on them before asking for the second attempt. (today, however, computer systems are more reliable rather than they were 15 years ago)

- **The Screen shot**: Student holds his cell phone up to his computer screen to take pictures of the exam and then uses the picture to communicate with a second party to find the answer

- **Proctoring** [13]: At the time when students take exams at home, the schools hire a third party to provide online proctoring during exams using a webcam,

For the back-end technique, there is no cheating because this end is the instructor’s end, and there are several control techniques an instructor can use to prevent cheating, such as Blackboard) [11]

### 3. Prevention of Front-end Cheating

#### 3.1 Front-end

Over the last three years, a process has been created to prevent front-end cheating. The process and the procedure are now implanted in online courses and/or hybrid courses. For hybrid courses, the students have to attend 30% of the course hours in the class presented during residency weekend.

A process base is used for:

- Creating course exams, tests, and a quiz policy
- The student signs a policy agreement
- Implementing the policy, procedure, and guideline

The process builds on an exam policy, which usually covers the following items:

To prevent end users from claiming “that their computer halted or/and there was a network connection disruption”,
4. Policy Outcomes

Before implementing the policy, grades were gathered for 2 graduate courses with 91 students as shown in Figure 2.

![Figure 2: Grades for two graduate courses before implementing the new course exam policies](image)

This diagram clearly shows an unhealthy grade distribution. The next semester, the policy procedure was put in place for two more graduate courses with a total of 80 students. As we can see in Figure 3, that result was more normal and realistic.

![Figure 3: Grades for two graduate courses after implementing the exam policies](image)

Through an analysis of the first case and its results, we found that the mid-term and final were set from a system back-end (in Blackboard) from the test option as Display Questions All at Once (the default) and the Backtracking was set to Off (the default). However, the question analysis showed that 70% of the questions were generated randomly as T/F. The issue was the instructor, who selected all questions (in Blackboard) without reviewing them or selecting the most appropriate ones for the final. Thus 70% of the question pool was built as T/F. It is now suggested that instructors “Review their E-test questions before releasing them.

5. Conclusion

The online learning and online courses are now much more popular, and with that change in instruction, a major problem has appeared, namely, online cheating (E-cheating). To prevent online cheating on tests, this current paper presents new classifications for prevention, namely, front-end (comes on the user end) and back-end (on the instructional side). The paper suggests several procedures and guidelines and a precise policy to control the front-end (user end).

6 References


[10] John Orlando How to Effectively Assess Online Learning
A Magna Publications White Paper, Madison, WI 53704, 2011


[12] niu.edu, "Tips for Preventing Online Cheating", 2017, can be retrieved from https://niu.edu/blackboard/resources/cheatingtips.shtml

