

## Implementing Technology to Prevent Online Cheating: A Case Study at a Small Southern Regional University (SSRU)

**Wayne Bedford and Janie Gregg**

University of West Alabama  
Livingston, AL 35470 USA  
[dbedford@uwa.edu](mailto:dbedford@uwa.edu)  
[jgregg@uwa.edu](mailto:jgregg@uwa.edu)

**Suzanne Clinton**

University of Central Oklahoma  
Edmond, OK 73034 USA  
[MCClinton1@uco.edu](mailto:MCClinton1@uco.edu)

### Abstract

Online education programs at colleges and universities continue to grow in popularity. As a result, major accrediting agencies require online programs to demonstrate rigor and integrity equivalent to that of similar on-campus programs. Federal Regulations also require online programs to positively identify the student taking course exams. Some universities are turning to technology to combat cheating and verify the identity of the person taking tests. They also use the same technology to monitor the testing environment for evidence of cheating. This paper provides a case study of the process used to evaluate, adopt, and implement Remote Proctor at a small southern regional university (SSRU). Remote Proctor is a device that verifies the student's identity through the use of biometric and photographic comparison.

**Key words:** Cheating, proctor, online testing, pilot study, biometric verification, accreditation.

### Introduction

Many universities with online programs are facing the same challenges of providing positive identification of students enrolled in online programs and reducing the occurrence of cheating on assignments and tests. Some may require online students to go to the campus or testing center to take tests; some require the tests to be proctored by a trusted agent; and others are searching for technological solutions. Remote Proctor from Software Secure (<http://www.softwaresecure.com/>) is one such technological solution that provides biometric identification and a secure, monitored testing environment. This paper provides a case study of the procedures used in the adoption and implementation of Remote Proctor and other technologies aimed at improving academic integrity of degree programs at a small southern regional university (hereafter, SSRU).

### Background

SSRU is a state supported institution located in a rural area of a southern state. It hosts approximately 2,500 on-campus students enrolled in undergraduate and graduate programs. SSRU also has about the same number of students enrolled in its online programs. The programs are accredited by the Association of Collegiate Business Schools and Programs (ACBSP), National Council for Accreditation of Teacher Education (NCATE), Commission on Accreditation of Athletic Training Education, National League for Nursing, and the Southern Association of Colleges and Schools (SACS). Like many universities, SSRU is attempting to confront the issues of cheating, plagiarism, and other forms of academic dishonesty in both on-campus and online courses.

### *Cheating and Technology*

Cheating is not a new phenomenon at colleges and universities. Research into why students cheat and how universities control these activities was conducted as early as 1964 (Bowers 1964). More recent research indicates that cheating not only continues to be a problem, but for the 10 years between 1992 and 2002, the incidents of cheating increased dramatically (McCabe 2001-2002; McCabe, Butterfield, & Trevino 2006). It also seems that students increasingly think it is ok to cheat (Etter, Cramer, & Finn 2006; Malone 2006; Roig & Ballew 1994).

Apparently, cheating has become such a prevalent and compelling topic that a recent prime time television show, *Without a Trace* (Steinbert 2009), used it as the theme. The episode revealed ways that students cheat and addressed one of the major reasons why they do it: competition to get into universities. If society is so very aware of high school students cheating their way into college, then it stands to reason that it can be expected once they arrive, as well.

SSRU incorporates a variety of technologies in the classroom to enhance the student's learning experience. Wireless access to the Internet, the Blackboard course management system, lecture capture systems, and textbook publisher resources provide rich content and encourage student collaboration. These same technologies, along with cell phones, text messaging devices and Bluetooth networking contribute to the increasing trend in cheating (Popyack, et al. 2003) and make it easier for students to cheat (Auer & Krupar 2001). Students are often more familiar with the technology than the instructors which makes cheating even more difficult to detect. Using the Internet and a myriad of search engines, students find applicable websites and simply copy and paste the material, claiming it as their own work (Akbulat, et al. 2008; Embleton & Helfer 2007). They use cell phones and blackberries to text test questions and answers to classmates; camera phones to take pictures of tests; and laptop computers to look up answers on the Internet (Popyack, et al. 2003). There are also websites that sell or subcontract term papers and projects written at any level on any topic (Ross 2005). While technology seems to facilitate student cheating, other technologies such as software to lock down the testing environment, cameras, biometric identification devices, Bluetooth enabled computers to detect other Bluetooth enable devices, and originality checking applications can be used by universities to combat cheating, both on and off campus and to meet the demands of accrediting and regulating agencies.

### *Academic Integrity in Distance Education*

In its Policy Statements on Distance Education, SACS requires that "the integrity of student work and the credibility of degrees and credits are ensured" (SACS: CS 3.4.6 and CS 3.4.10 2008). In order to maintain their accreditation (or be reaffirmed), universities must demonstrate they have processes in place that will reduce opportunities for students to cheat. For its part, SSRU implemented Turnitin.com as its first process for enforcing its academic honesty policy. Turnitin.com is an online resource used to verify the originality of term papers and other writings. Instructors or students submit papers to the Turnitin.com database which then compares the submitted document to others in the database and on the Internet. A report is then generated that identifies the percentage of material directly copied from another source. The overall intent of this implementation has been to reduce the amount of copy and paste activity from the Internet.

The federal government has also placed restrictions on universities with online programs. The Higher Education Opportunity Act of 2008 (HEOA) states "...the agency or association requires an institution that offers distance education or correspondence education to have processes through which the institution establishes that the student who registers in a distance education or correspondence education course or program is the same student who participates in and completes the program and receives the academic credit" (HEOA: Issue 10 2009). Many universities use proctors or commercial testing sites to meet this requirement. Students taking tests are either known by the proctor or asked to show an ID and the testing environment is monitored in an effort to discourage cheating. SSRU is looking toward a technological solution that will meet HEOA requirements. As part of a research project on cheating and technology, SSRU began evaluating the usefulness of Remote Proctor to verify the identity of online students and monitor potentially suspicious activity in the online testing environment. Remote Proctor uses a combination of biometric authentication; software controlled testing environment; and a 360° video camera to discourage cheating. The next section describes the decision process used.

## Case Study

Early in 2008, the authors were researching ways that students use technology to cheat in on-campus courses and how faculty can use technology in the classroom to discourage and detect cheating. The research led to information on a project at a nearby university which was conducting a trial of Remote Proctor for testing in its online classes (Powers 2006). Initial reviews from that university were generally positive. Since SSRU has an extensive online program; contact was made with executives at Software Secure for more information. Arrangements were made for a representative of Software Secure to join a presentation of the research on cheating at the spring 2008 faculty colloquium to introduce Remote Proctor to the SSRU faculty. Plans were made to conduct a pilot study of Remote Proctor at SSRU.

### *Pilot Study on Remote Proctor*

The pilot study was designed to test the Remote Proctor device in a controlled environment to simulate conditions for installation, registration and testing. A small classroom was equipped with five computers, each separated by partition. Each student would be required to install the Remote Proctor on their assigned computer and complete a sample test. The study would provide information about its ease of use by students and faculty, and make a recommendation about the adoption of the product in online courses. The results of the study were presented at the fall 2008 faculty colloquium and published in the *Proceedings of the 51<sup>st</sup> Annual Meeting of the Southwest Academy of Management* (Bedford, Gregg, & Clinton 2009). Additionally, the results were presented to the SSRU Dean's council who would be deciding the fate of Remote Proctor. The pilot study and results are summarized below.

### *Materials*

Once a school adopts Remote Proctor, the device is available to students for \$150 plus \$30 per year software license. Software Secure provided SSRU with five Remote Proctor units for a period of 30-days for evaluation plus a 30-day academic license for Securexam for Remote Proctor software to cover five students. The total cost of the pilot study was \$750.

### *Participants*

Faculty members from all colleges (Table 1) were encouraged to participate in this study. No special criteria were required for participation except an interest in improving the caliber of online programs. An email was sent to participating full-time faculty members with a questionnaire attached. Instructors were asked to visit the Remote Proctor web site to view the videos taken during the test period and then complete and submit a questionnaire about the experience. Participating faculty included 40% from the College of Business, 25% from the College of Education, 10% from the College of Liberal Arts, 5% from the College of Natural Science and Math, 10% from the School of Nursing and 10% from administrators who also teach online classes but are not assigned to a college.

Table 1. Participating faculty

College/School	Number of Responses
Business	8
Education	5
Liberal Arts	2
Natural Science & Math	1
Nursing	2
Other	2

Due to the short time period of the study, students in the College of Business were asked by their instructors to participate in the study by taking one or more prepared tests using Remote Proctor. The

grades on these tests were unimportant to the process. The students installed the Remote Proctor hardware and software, enrolled their credentials (fingerprint and photo), and took one or more tests on the Software Secure Blackboard site. The students were encouraged to shuffle papers, talk, use their cell phones and perform other activities that would be captured as suspicious video by Remote Proctor and recorded to the administrative site. After completing the test(s), the students completed a short questionnaire about their perceptions of the process. The results from the student and faculty questionnaires are presented in the analysis section of this paper. Table 2 provides a breakdown of the participating students by rank and gender. Freshmen and sophomores were likely to be taking classes in other colleges as well as the College of Business; juniors and seniors were likely to only be taking courses in the College of Business.

Table 2. Student demographics

Rank	Gender		Total
	Male	Female	
Freshman	5	0	5
Sophomore	2	2	4
Junior	5	3	8
Senior	11	3	14
<b>Total</b>	<b>23</b>	<b>8</b>	<b>31</b>

### *Process*

For the purposes of this study, Software Secure prepared three courses on its Blackboard site along with sample Remote Proctor tests. Since the purpose of the study was to examine the usefulness of Remote Proctor to identify the student and monitor the test environment and not to test the students knowledge of any subject, these sample exams were deemed sufficient to evaluate the Remote Proctor testing system for our purposes. These prepared exams precluded faculty from having to prepare and upload special exams just for this project.

### *Students*

It was desirable to have as many students as possible participate in this study. The actual number (31) of participants was sufficient to provide a statistically normal sample. Online students using Remote Proctor to take an online exam will be required to register their credentials (fingerprint template and picture), login to the test site and complete the test. Remote Proctor will authenticate the person taking the test and monitor the test environment for suspicious activity. To make the experience reflect, as closely as possible, a typical online student testing situation, each student was required to do the following:

- remove the Remote Proctor and other materials from the original box;
- review installation instructions and other documentation;
- assemble the Remote Proctor;
- install the software and hardware following the instructions provided;
- register the installation and enroll their credentials;
- logon to the Software Secure Blackboard site and take the exam(s).

As a test of the Remote Proctor capabilities, students were asked to perform activities that activate the suspicious activities monitor (talk, open a book, etc.). The activities were captured and recorded on a test site for viewing by faculty.

After finishing the tests and closing Blackboard, the students completed a short questionnaire. The entire process (installation, registration, exam and questionnaire) took the student about one-half hour to complete.

### *Faculty*

All faculty members were emailed a copy of the questionnaire and encouraged to participate in this study by doing the following:

- Review the Remote Proctor videos of the students recorded on the Remote Proctor web site ([www.remoteproctor.com/login/school-b](http://www.remoteproctor.com/login/school-b))  
Userid for Faculty =teacher-b  
Password =teacher-b;
- Return the completed questionnaire via email.

Twenty faculty members from across all colleges responded to the questionnaire.

### *Analysis*

Excel was used to provide the statistical analysis of the student and faculty questionnaires. Demographic data was collected from the student and is shown in Table 2. The sample was 74% male and 26% female. A majority of the students were juniors and seniors. Only four of the students reported they had taken online classes at SSRU; however, nine indicated plans to take online courses. As illustrated in Figure 1, 48% of the students were supportive of adopting Remote Proctor while 22% were not supportive and 30% expressed no opinion.

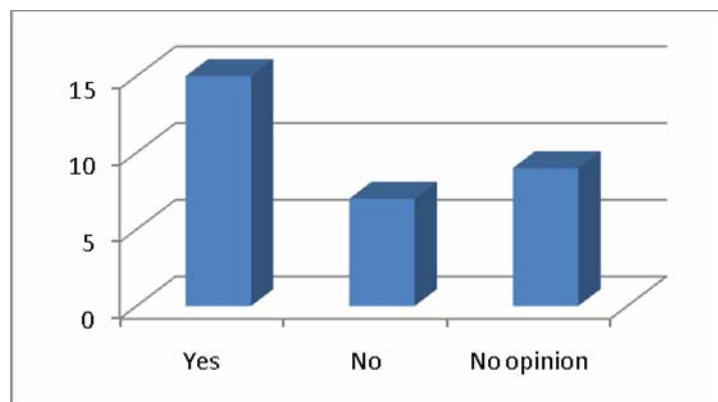


Figure 1. Student recommendations

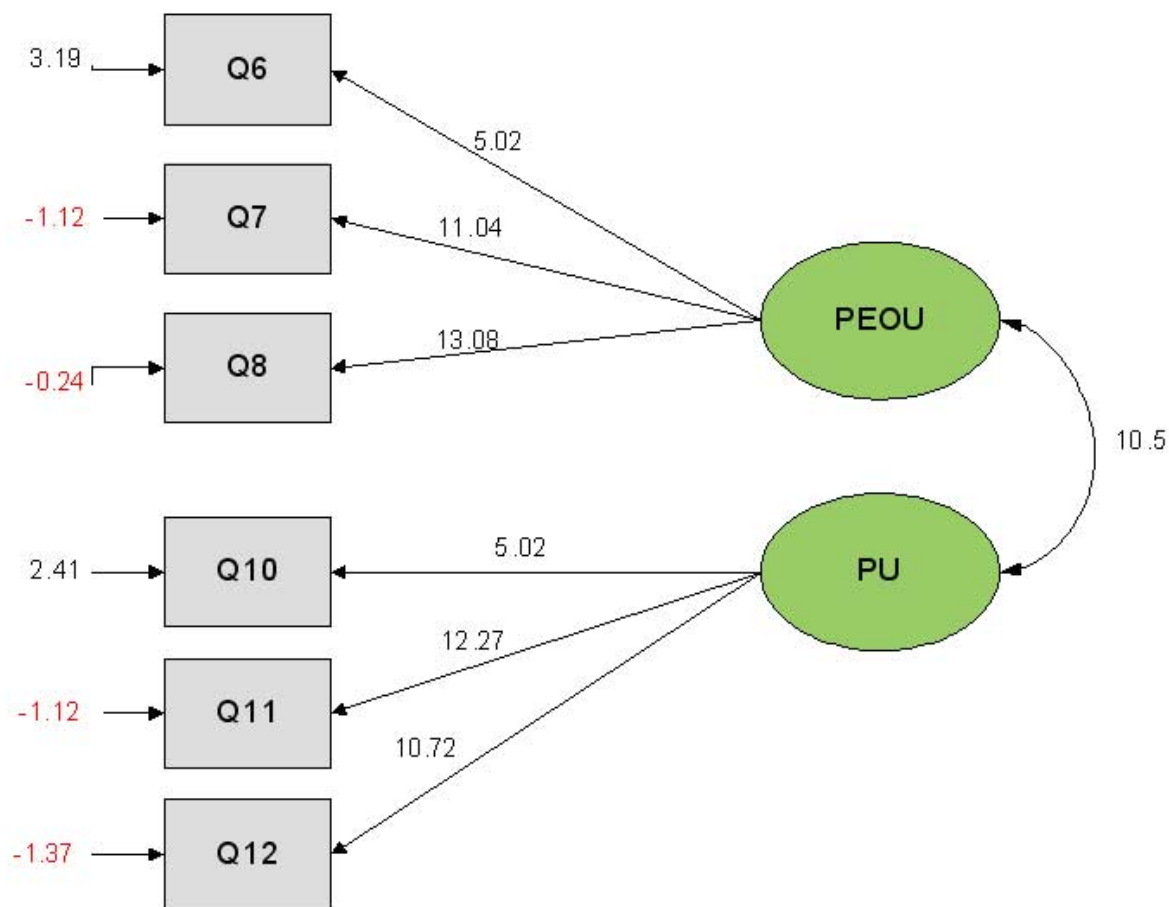
### *Acceptance and Adoption*

The successful adoption of a new technology is frequently determined by two primary factors: perceived usefulness and perceived ease of use (Davis 1989). Perceived usefulness is defined as the degree to which users believe that the technology will facilitate the process. The process evaluated in this study was reducing opportunities for cheating and was addressed in questions 6, 7, and 8. Perceived ease of use is defined as the degree users find the effort involved in using the technology as minimal. This factor was addressed in the student questionnaire by questions 10, 11, 12. They were also addressed in the faculty questionnaire by questions 1, 3, 4 (ease of use), and 5, 6, 8 (perceived usefulness).

Structural equation modeling (SEM) was used in this study to identify the strength of the relationships between the variables and their effect on the latent variables of perceived usefulness (PU) and perceived ease of use (PEOU). Figure 2 illustrates the SEM model used in this study.

All of the variables were significant with *t* values well above the critical value of 2.457 ( $\alpha=.05$ , 30df). Additionally, the goodness of fit statistics for the model indicate an overall good model. Key goodness of fit indices include  $\chi^2 = 9.78$  with a *p*-value of 0.28 and 8 degrees of freedom, adjusted goodness of fit

(AGFI) = 0.94, and root mean square of approximation (RMSEA) = 0.086. The model confirms that students (1) view Remote Proctor as useful for reducing or discouraging cheating (2) view the system as easy to set up and use and (3) are supportive of the system and are willing to adopt Remote Proctor.



Chi-Square=9.78, df=8, P-value=0.2808, RMSEA=0.086

Figure 2. Structural equation model

Instructors were more limited in their exposure to Remote Proctor. Unlike students who were required to install, configure, and use Remote Proctor, instructors were only asked to view the videos captured during the time the tests were taken. Due to the small sample size (20), SEM could not be used for analysis. However, instructors supported adoption at a rate of almost 5:1 (Figure 3).

The results of the pilot study were presented at the September 2008 Dean's Council along with a recommendation to adopt the system. Several of the members participated in the study and added their recommendations. The adoption of Remote Proctor for online testing was approved with a target date of spring 2009.

#### Implementation

The academic year for the online program at SSRU consists of five 8-week terms beginning in mid August; Fall 1, Fall 2, Spring 1, Spring 2 and Summer. The decision to adopt Remote Proctor did not occur until late in the Fall1 term. Several issues were identified as critical to successful implementation and included technological issues as well as student and faculty issues. A committee was assembled to address these issues. Committee members consist of the Director of Information Technology (chair),

Dean of the College of Education (online graduate degrees), Dean of the Graduate School, Dean of Online Studies, and the Associate Dean of the college of Business.

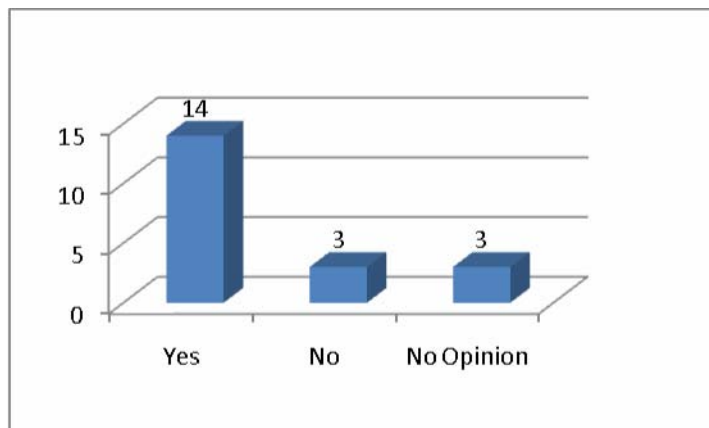


Figure 3. Faculty recommendation

Technical issues involved interfacing the course management software (Blackboard) so the Remote Proctor software would recognize the faculty assigned to the course. This is necessary so the faculty member can develop and deploy the Remote Proctor exams. Also, the bandwidth and storage requirements for handling the streaming video from (theoretically) 2500 concurrent exam takers demand the architecture be highly scalable. There is also the issue of user support and which campus office/department will be responsible. SSRU's Information Technology (IT) department will provide helpdesk support from 8:00am to 5:00pm. Secure Software and IT are in process of testing the other factors.

Student issues center around two factors: technical support with installation and registration (handled by IT) and purchasing the Remote Proctor. The device is available in the online bookstore and is used in every online course offered. All online students are required to purchase Remote Proctor unless they are within one term of graduation. This precludes a student having to spend \$180 to take only one or two tests. Students living near SSRU would be allowed to come to campus to use Remote Proctor units available in the Julia Tutwiler Library. Others are handled on a case by case basis using either testing centers or live proctors. The Dean's Counsel felt it was essential to develop a privacy use statement to be given to each student.

Faculty issues are associated with monitoring the saved videos for suspicious activity. While Software Secure does offer monitoring service, it is quite expensive due to the number of students and exams involved.

Once the identified issues were resolved, a date for implementation was chosen – Spring 2 students must purchase and begin using Remote Proctor. Announcements were made on the SSRU homepage, the main page for each online course, the course registration page, and in news media (Bathwal 2009).

### Unresolved issues

Even though the committee attempted to address the major issues that arose during implementation, there are still issues that remain unresolved:

- Remote Proctor is not yet available for Macintosh or 64-bit PCs. This is anticipated to be resolved by fall1-2009;
- Military students stationed in Iraq and Afghanistan cannot get Remote Proctor overseas or attach to a military computer; and
- Students who need special assistance under the guidance of the Americans with Disabilities Act (ADA)



Even though they remain unresolved from a technology standpoint, Remote Proctor will greatly reduce the need for human proctors. The company is working to make available the Macintosh software as soon as possible, hopefully before the summer session is over. Military students have access to commanding officers who are very familiar with and willing to proctor exams to enhance the education of their troops. And, students with disabilities have to be handled in a manner related to helping them overcome their particular disability. This would be the case whether online or in the classroom. For example, some students simply need more time to take a test; therefore, a separate test can be made for them which will allow them to have more time which other students will not be allowed to access.

Remote Proctor was fully implemented during the Spring 2 online term, but not without some minor difficulties. SSRU's IT department received some 600 calls for assistance installing Remote Proctor, several faculty members needed additional help installing ExamBuilder software, and some students expressed concerns about perceived privacy violations. In spite of the difficulties, Remote Proctor is now in use in the online program and initial response by both students and faculty is generally positive. It seems fair to say that implementing a project such as this, regardless of proper planning, is likely to encounter issues. However, it is anticipated that Remote Proctor will prove to be another tool to help ensure the quality and integrity of SSRU's online program.

### Conclusion

In today's fast-paced, high tech society, the opportunity to cheat has increased, and research has shown that, in fact, cheating is on the rise. Colleges, universities, and accrediting bodies have become concerned about cheating, especially in the area of determining whether the student who registered for a class is actually the one taking the tests and doing the work in the online environment. The research presented in this case study has shown that the Remote Proctor may be a valuable resource to colleges and universities when determining that students are actually doing their own work. Because of its low cost and functionality, its use will be more cost effective for students and the university, in the long run. Faculty and students both feel the device will help curb cheating.

### References

- Akbulat, Y., Sendaq, S., Binnci, G., Kilicer, K., Sahin, M. C., & Obadasi, H. F. (2008). Exploring the Types and Reasons of Internet-Triggered Academic Dishonesty among Turkish Undergraduate Students: Development of Internet-Triggered Academic Dishonesty Scale (ITADS). *Computers & Education*, 51(1), 463-473.
- Auer, N. J., & Krupar, E. M. (2001). Mouse click plagiarism: The role of technology in plagiarism and the librarian's role in combating it. *Library Trends*, 49, 415-432.
- Bathwal, B. (2009). Software Secure Remote Proctor Deployed by University of West Alabama
- Bedford, W., Gregg, J., & Clinton, S. (2009, February 24-28, 2009). *Using Technology to Prevent Online Cheating: A Pilot Study of Remote Proctor*. Paper presented at the 51<sup>st</sup> Annual Meeting of the Southwest Academy of Management, Oklahoma City, OK.
- Bowers, W. J. (1964). *Student dishonesty and its control in college*. New York: Bureau of Applied Social Research, Columbia University.
- Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), 319-350.
- Embleton, K., & Helfer, D. (2007). The Plague of Plagiarism and Academic Dishonesty. Retrieved August 26, 2007: <http://search.ebscohost.com/login.aspx?direct=true&db=buh&AN=25525127&site=ehost-live>
- Etter, S., Cramer, J. J., & Finn, S. (2006). Origins of Academic Dishonesty: Ethical Orientations and Personality Factors Associated with Attitudes about Cheating with Information Technology. *Journal of Research on Technology in Education*, 39(2), 133-155.
- Malone, F. L. (2006). The Ethical Attitudes of Accounting Students. *Journal of American Academy of Business*, 8(1), 142-146.



McCabe, D. L. (2001-2002). Cheating: Why students do it and how we can help them stop. *American Educator, Winter*, 38-43.

McCabe, D. L., Butterfield, K. D., & Trevino, L. K. (2006). Academic Dishonesty in Graduate Business Programs: Prevalence, Causes, and Proposed Action. *Academy of Management Learning & Education*, 5(3), 294-305.

Popyack, J. L., Herrmann, N., Zoski, P., Char, B., Cera, C., & Lass, R. N. (2003). *Academic Dishonesty in a High-tech Environment*. Paper presented at the 34th SIGCSE technical symposium on Computer Science in Education.

Powers, E. (2006). Proctor 2.0. *Inside Higher Ed*. Retrieved from <http://www.insidehighered.com/news/2006/06/02/proctor>

Roig, M., & Ballew, C. (1994). Attitudes toward cheating of self and others by college students and professors. *The Psychological Record*, 44, 3-12.

Ross, K. A. (2005). Academic Dishonesty and the Internet. *Communication of the ACM*, 48(10), 29-31.

Steinbert, H. (Writer) (2009). Without a Trace. In J. Bruckheimer (Producer): CBS.

---

Manuscript received 3 Apr 2009; revision received 29 May 2009.



This work is licensed under a  
[Creative Commons Attribution-NonCommercial-ShareAlike 2.5 License](http://creativecommons.org/licenses/by-nc-sa/2.5/)