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CHEATING IN CYBERSPACE: MAINTAINING QUALITY IN ONLINE EDUCATION

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Professors in higher education are experimenting with a wide array of techniques to preserve integrity of the academic evaluation process in the online environment. Current instructors perceive some increased risk of “cheating” in cyberspace classrooms, and some changes in the forms these incidents take. We anticipate the continuing evolution of new techniques and new technologies to assist us in the ongoing process of delivering, evaluating, and maintaining high-quality online educational programs.

Recent scandals at prestigious academic institutions have indicated that cheating may be common in classrooms, and instructors in distance learning fear that such cheating and plagiarism may undermine the integrity of the distance learning (DL) teaching environment. There are also indications that some academic researchers may be using online systems for intellectual property theft and plagiarism. For example, a college president presented a speech “written” by a ghostwriter who really plagiarized an essay posted online. “...the power of Web technology has only increased plagiarism incidents.” (Dyrli, 2000).

Instructors who rely on traditional research papers as an important method of teaching and student evaluation were disturbed by the implications of the scandal at the University of Virginia in the spring of 2000. A physics professor created his own computer program to analyze the papers of 1,850 of his students (Young, 2001). He determined that about nine percent (156) of his students had plagiarized research paper material over a period of five years. There appears to be considerable credibility to his conclusions since 19 months after the initial revelations, 48 students were expelled, the only penalty available for “lying, cheating and stealing” under the school’s honor code. The University also revoked the degrees granted to three of those expelled (The Washington Post, 2002).

Other researchers have concluded that the Internet has made it easier for students to plagiarize research papers and other academic work (Standler, 2000). Some articles have described the large number of commercial Internet sites selling such papers, and noted the flexibility and sophistication of their marketing techniques (Parks, 2001). A few others have noted that a variety of researchers practiced even more sophisticated misuses of Internet technology, such as copying material from obscure databases of scholarly papers and extracting text from conference proceedings (Fain & Bates, 2002).

Such findings are particularly disturbing news to those in the academic world, since some already suspect that electronic tools and search engines may be undermining academic integrity in online courses. There is an existing perception, often expressed by those who oppose distance education, that online courses are of less “quality” than courses provided in the face-to-face (F2F) classroom environment. While some of these objections appear to be transparent expressions of resistance to change, there is an element of real concern among faculty that academic quality may be compromised by the new medium, by related changes in the population of students, and by the inability of students and faculty to maintain the type of personal and scholarly relationship that best typifies the academic “learning environment.”

While there are many factors to be considered in making comparisons of educational quality in the different presentational media, the most emotional and potentially damning argument is that online education is readily susceptible to fraud. Our experience with colleagues at academic meetings (as well as in the literature and the press) has been that a sensitive element

of these criticisms is a concern with the integrity of the student evaluation process in the online environment. The most common statement of these objectors is, "How do we know that the person getting the degree is the one who did the work?" In other words, is it possible for an individual to obtain a degree without doing any of the work required?

Any uncertainty as to the accuracy and integrity of the student evaluation process in the online classroom feeds doubt as to the quality of graduates produced from that environment. Looking at this concern analytically, the authors of this article note that the validity of all parts of the student evaluation process must be examined to assure their integrity and accuracy. If single products such as research papers and exams cannot be accepted with confidence, the evaluation process and any consequent certification of skill or achievement can be questioned.

By researching the literature, examining the online educational environment, and interviewing online distance learning instructors and students, we attempted to determine whether there were increased problems of "cheating" in cyberspace classrooms; and if so, how they were being resolved by practitioners. We reason that any success in correcting real or perceived problems of evaluation will be highly useful in assuring the academic integrity and quality of online educational programs. Research included interviews with experienced professors at three distance-learning institutions: the National Defense University, the University of Maryland University College, and Western Carolina University. In addition, we solicited the experiences of experienced experts in the field during our presentations at professional conferences.

QUALITY IN ONLINE EVALUATION

Even instructors who actively champion distance learning as a teaching methodology have expressed doubts as to the integrity and accuracy of some methods of evaluating students on line. What *are* the types of evaluation best suited to cyberspace? Current policies and standard practices distance learning institutions use include such workarounds as remote testing centers, and student-selected proctors. Other techniques that are awkward to implement and are seemingly less rigorous provide less assurance of integrity than traditional classroom testing and evaluation methods. To provide that rigor and assurance, the authors have experimented with group

and team products, open book problems, and other methods of testing. We looked at faculty experience in the area of evaluation of online students, and provide that experience as a compilation of “best practices” and pragmatic solutions. At each step of our research, we attempted to compare the classroom and online environments.

First, the researchers asked if problems of “cheating” were real. Are there perceptions of more “cheating” or “plagiarism” by students in online college courses? Does the online environment differ from the classroom by providing greater incentive or opportunity to subvert evaluation controls?

In one area nearly all sources agreed: the current educational environment in general provides more incentive to cheat than ever before (Bushweller, 1999). The work environment has become much more competitive in the US as graduate degrees have become more numerous. It is common knowledge that a graduate degree is increasingly seen as the minimum requirement for advancement in many fields. In fact, many businesses will pay for the graduate tuition of their workers. This is seen as a relatively inexpensive way to “lock in” talented people for several years and assuring their loyalties while developing useful skills. This may create critical financial pressures. For example, it is a growing practice for a company to pay for courses only if the student gets an “A.” Any other grade will require the student to pay a percentage of the tuition and fees. Since the student must submit the grades to the company for reimbursement, a very poor showing might endanger that student’s present livelihood as well as his/her future opportunities in that organization. Such pressures can be unbearable and exceed the bounds of simple educational incentives. The student in this situation requires an “A” at any cost.

There are other incentives. Foreign workers can get specialized visas to work in the US by obtaining job offers from employers. One easy way to demonstrate employability is to show an advanced degree in an area of critical labor shortage such as Information Technology. Those who can get a degree from a recognized U.S. institution of higher education may have a quick and dramatic change in pay, status and lifestyle. In some cases, it can be a ticket out of a depressed or war-torn country. In such cases, online education can be a significant factor, since it is much cheaper and more accessible to foreign students. There are no passports, immigration and customs scrutiny, no medical checks, and no student visas required to take online courses.

Once enrolled in online academic programs, students from other cultures may apply greatly different ethical standards and values. Without being xenophobic, it is easy to see that students from countries torn by war or genocide, or under dictatorial rule, might not consider term paper or research ethics of any great significance compared to their own problems. Researchers doing analyses of international testing practices and U.S. certification of foreign graduates found statistical evidence of cheating in many areas, scandals, and in some cases, "examination malpractices that...have been extraordinary..." (Cizek, 1999). There is no reason to suppose that students in online classes would have stronger ethical bonding or acceptance of group norms on cheating than students in face-to-face classes. Many agree with Bruno who attributes the inclination to cheat to the anonymity of any classroom environment whether it is the huge traditional classroom lecture sections or the online environment: "*When students cheat, don't blame the Internet. Cheating...often springs from the depersonalization of modern life....Technology, of course, can contribute to anonymity*" (Bruno, 2001).

Finally, there are pressures of time. A company that pays for the formal education of a worker usually gains an additional benefit: the learning activity usually takes place in the evening or on weekends. This means that the worker gets no time off from his/her regular job. Often, this leads to serious time pressures on the student/worker, and such intolerable pressures are painful motivations to plagiarize. But there is a new wrinkle in the "Age of the Internet": business travel and international activities. Previously, adult learners had to commit to specific times they would attend face-to-face classes; today, the boss may insist that the worker continue work-related travel because his/her classes are online. As thousands can testify, it is often difficult or expensive to do homework in airport terminals, "Internet cafes," and hotel rooms. In some foreign countries, working online is even more difficult, and sometimes, impossible. In addition, at key periods in an online class, library facilities, and many kinds of research materials may not be available.

There are also greater opportunities to cheat in many ways. Some come about because written material is digitized, and can easily be copied, manipulated, or "cut and pasted." This does not apply only to online courses. Material can be illegally copied and printed out for any kind class environment, online or offline. In asynchronous online discussions, however, "cut and pasting" is much more easily and readily done, and has small

risk to the student who does it. Short responses to a question are not footnoted, and usually don't contain enough material to give an instructor clues to plagiarism. An instructor may also be discouraged from analyzing asynchronous threads and e-mail traffic by the great number of short responses that may be involved.

There are other temptations and opportunities for students in the "Age of Information." Students mention that computers in university computer "labs" often have term papers inadvertently stored on the hard drives: draft copies left there by previous students. At work, a student may have access to proprietary or private material already digitized and suitable for theft. There is almost no chance that plagiarism from such sources will be detected.

The current environment also has increased opportunities to cheat in the major intellectual exercise typical of many courses—the research paper. There is clearly a much greater access to plagiarized papers—and it is increasing. An AOL search of the term "term paper" resulted in 9,267 sites. This number became 9,268 sites two hours into the search process. The computer allows databases of academic papers to be searched, sorted and retrieved far more precisely, and the products are far more up to date and difficult to detect than ever before. Term paper mills have become organized databases, and very big business.

Papers are not only sold by unethical businesses. Research groups and consultants such as the Gartner Group produce analytical business and technical papers of very high quality for their clients. Their "Executive" analyses, for example, are only available to those who pay thousands of dollars for access. The Gartner portfolio of analyses and reports contains many hundreds of papers, most of which are too expensive to be seen by the ordinary professor, and which therefore cannot be checked for plagiarism. Other credible groups have information available: The Education Resources Information Center, which produces more than 200 ERIC Digests – two page syntheses of "the best, most current research on a topic" (<http://www.ed.gov/pubs/>) and SpeakOut.com (<http://speakout.com/about/>) are self-described on their websites as an "online opinion research company that allows you to tell it like it is."

The Internet has also created new access to remote collections of papers, unlikely to be known to an instructor. Some universities or college departments have posted the outstanding papers of its students and scholars. Such

postings we found in Canada, England, Israel, Finland, and Russia. One scholar spoke of detecting a paper that had been translated from the Chinese. The only way she was able to sense the plagiarism was because the paper used a certain obsolete communist ideological term.

How significant is this problem? Highly significant. Scanlon and Neumann (2002) reported that approximately 89% of students surveyed agreed that using the Internet to copy text to hand in as one's own is wrong, yet nearly 25 % admitted to doing so. Of course, there is abundant evidence that students' actions often are out of line with stated principles. "Most students say that it is wrong to cheat," concluded Davis, Grover, Becker, and Mc Gregor (1992) who noted that "the percentage of students answering yes to the question, 'Is it wrong to cheat?' has never been below 90%" at the schools they surveyed (Davis, 1992). Yet, the Scanlon reported cheating rates as high as 75 % to 87 % among the same students (Scanlon 2003). A 1991 Rutgers University study of 16,000 students from 31 prestigious U.S. universities, found that 66% of students cheated at least once and that 12% were regular cheaters. A 1997 Psychological Record study found that 36% of undergraduates have plagiarized written material. The commercial source from which many of these figures were obtained, Plagiarism.com, also stated, "Plagiarism is one of the most serious offenses in the academic world. It has occurred as long as there have been teachers and students, but the recent growth of the Internet has made the problem much worse. Other studies indicate that approximately 30 % of all students may be plagiarizing on every written assignment they complete (Wilhoit 1994).

EVALUATION PROCESSES IN THE ONLINE ENVIRONMENT

The new opportunities and incentives to cheat and the apparent widespread plagiarism prompt the question, "How do we evaluate the online student fairly and accurately?" Asking experienced DL instructors this question, we received a variety of interesting responses, indicating problems experienced professionals have found, and the types of solutions they have used.

- *Tests.* If tests are online, they require some simultaneity to be fair and preserve the "answers." Often they are time sensitive in length, in start

times and end times, or paced in some way to restrict access to impermissible resources. This is often very difficult in global, multi-time zone environments, and totally synchronous testing is often impossible. By necessity, tests must be open book, unless proctored. Some test proctoring is impossible—students traveling, in foreign countries, doing military duties at remote sites or on ships. Some institutions have attempted to respond to this problem by having regional campuses; other academic institutions or professional testing companies provide reciprocal test proctoring.

While these practices can work well in many large urban centers in the US, or within a state university community, they can be expensive and may not work at all in foreign countries. Within the military, especially on board ship or in bases overseas, officers or education specialists can provide proctoring services. Outside of academic and military institutions, however, it is not clear how well such proctoring works. In several cases, faculty mentioned that students in distant regions were allowed to propose local proctors within their own companies. One such student, a vice president of a software company, proposed one of his employees; another proposed his secretary. Such proctoring seems absurd.

- *Research papers and plagiarism.* Plagiarism is a difficult concept to define. It includes a range of actions from failure to use proper citation to wholesale cheating. In “Helping Students Avoid Plagiarism” Stephen Wilhoit lists the following types of plagiarism:
 1. Buying a paper for a research service or term paper mill.
 2. Turning in another student’s work without that student’s knowledge.
 3. Turning in a paper a peer has written for the student.
 4. Copying a paper from a source text without proper acknowledgment.
 5. Copying materials from a source text, supplying proper documentation, but leaving out quotation marks.

6. Paraphrasing materials from a source text without appropriate documentation (Wilhoit 1994).

The Internet has created an additional type of plagiarism: Turning in a paper from a “term paper” website. These have been called “digital paper mills.”

Paper mills are organizations that either sell or give away prewritten term papers for use by students looking for a way to avoid doing the assignments themselves. Digital term paper mills are sites that exist on the Internet for the same purpose. These online groups are not constrained by the need to generate revenue by selling their manuscripts; the “free” sites typically receive their money from advertising.

Examples of such term paper services sites include:

1. The former “Evil House of Cheat” has become the Essays and Papers for Students (www.cheathouse.com).
2. ChuckIII (www.chuckiii.com/topsites) advertises over “30,000 free essays and term papers” as well as “101,000 high-quality term papers and essays” on the “Top 100 Term Paper Sites.” There are also “Pay Sites” where a student may search for papers at \$19.95 for a 30-day membership or \$49.95 for a 180-day membership. There are other inviting links such as “Spring Break Vacations” other “Advertising Opportunities” for companies wishing to target college students.
3. Other People’s Papers (www.oppapers.com)
4. Free Term Papers International (www.freepapers.com),
5. A-1 Term Paper (www.a-1termpaper.com) who will call you with a custom quote for your paper, written in the format and citing methods required based on a specific edition of an indicated book upon which the term paper is to be based.
6. Genius Papers (www.geniuspapers.com) charges \$19.95 for a whole year of term paper access.

7. The Doctor's (www.serve.com/doctor), compete with thunderbolt and lightning, offers the 24-hour services which include "Term Papers – Research Papers - Theses- Dissertations – Essays – Reports – Homework – Entrance Applications – Lab Assignment – Special Projects – Computer Programs – Etc." The "etc." includes resumes, cover letters, applications, business and computers services, among others. The cost is \$5.00 per page. Students who refer their friends have the opportunity to "Make Money by Recommending Us to Others," and can e-mail or request assistance by telephone.
- *Process.* Another way to evaluate a student is to observe his/her progress through an effort such as a collaborative or group activity. This is quite popular as part of a learning-centered approach to distance education. There are problems with this as a methodology for evaluation, especially if the process is not fully transparent. Out of the sight of the instructor, for example, one individual may not carry his/her fair share of the load. This can happen when e-mail, synchronous discussions, or face-to-face meetings take place, and the instructor cannot observe.

But in distance learning, there are also difficulties with group communication over different time zones, and problems of control over scattered individuals. If a group has its members spread out over a small geographic distance, such as a military base or a local urban area, the group may meet physically, while others are constrained to meet "electronically." One professor cited a group of students on Okinawa, who met at a house rather than collaborating online. This gave them a significant advantage over their peers in other groups, and their group product was much better. Is this "cheating?" In 2001, a group of Arizona high school sophomores were punished for sharing answers to English assignments over the Internet. The students did not understand the extent to which they could use e-mail or chat rooms to discuss schoolwork (Cox, Matthews, & Associates, 2002).

- *Direct interaction.* A continual, steady interaction between student and teacher may enhance the recognition of student capabilities. Some instructors believe that after many interactions they are able to recognize a student by his or her "style" or "writing." For example, a professor noted an international student who wrote totally illiterate e-mail messages, but produced a research paper which was a model of elegance and sophisticated style. One of the problems with such a process

is that several professors indicated that they would not challenge a student seriously on evidence of syntax and semantics alone. One professor cited a case in which he received an extremely bad reaction from a student who challenged his ability to do comparative linguistic analysis on his written materials. Upon reflection, the professor withdrew his comments rather than face the difficulties of defending his purely subjective, nonscientific assessment—even if it were likely to be true.

SUGGESTED SOLUTIONS

There are a number of innovative and interesting strategies or practices used by teachers to give greater assurance of integrity in evaluating online students.

- *Open book with time limitations.* Some professors have allowed all students general access to all of their written materials, but enforce a strict one-time access for a predetermined period of time; for example, a final exam period of three hours. Instructions have been specifically stated that any material not totally original with the student must be credited to its original source and no information is to be obtained from any “human” sources.
- *Research topics selected by teachers.* By making paper topics very current, very specific and on unique topics, the pool of possible already-written papers is very dramatically reduced. This includes proprietary and consultant papers, as well as those of the term paper mills.
- *Supervised testing.* Some professors are using regional academic institutions for testing.
- *Observable or verifiable collaboration processes.* Some professors require that all discussions take place in asynchronous, observable, threaded, recorded sessions. The professor may also require written minutes of any telephone conferences or online audio chat session. Some students voluntarily copied and pasted their threaded bulletin board discussions and chat sessions into a document attached to an e-mail notification of the team session.

- *Workbooks and progressive work products.* By requiring all steps of a process to be recorded, the probability (and utility) of plagiarism is much reduced. For example, writing out each step in solving a math problem; submitting drafts of a paper; going through specific, successive steps in problem-solving activities.
- *Using case books.* By using cases or casebooks, instructors limit the utility of a student's access to proprietary, or hard-to-access material. Instructors cautioned, however, that after a case or casebook has been used for a while, a stock of past papers becomes available.
- *Detectors.* There are sites that provide services to professors trying to detect plagiarism. www.plagiarism.org directly sponsors www.turnitin.com software, a subscription service which allows professors to see if their student papers have been copied from Internet services or from other papers contained in their database. It color codes materials by degree of similarity between a submitted paper and a source. It also gives the direct link to the first page of the original work and gives the original text in color beside the challenged student text. They now state on their web page that their "internet database now indexes over 4.5 billion pages, making it one of the most complete databases of its kind and assuring our clients the most comprehensive plagiarism search available." By the summer of 2004 they plan to "integrate with *Blackboard's Learning System™* and *Portal System™* ..." and "become a WebCT Campus Edition and Vista users *Power-Links* Partner," providing easy access to Turnitin accounts from within the course management software (Turnitin.com, 2004).

The [plagiarism.org](http://www.plagiarism.org) site is not to be confused with Glatt Plagiarism Services (www.plagiarism.com), which offers three teaching and plagiarism detection software products. The first is a screening program for institutions and faculty. The U.S. Naval Academy and the University of Colorado at Boulder are among the universities listed using this program. It also offers a self-detection program intended for use by individuals to find unintentional instances of plagiarism and a computer assisted tutorial on plagiarism which includes assistance with re-writing a detected plagiarized material.

Other researchers also list any number of detection services for non-original work (McMurtry, 2001). We have discovered that some of these services have a short life span. Services available and active one month have disappeared without trace the next.

1. www.asubmitpaper.com no longer exists
2. Integriguard, www.integriguard.com/ is currently for sale
3. Paperbin at <http://www.paperbin.com/> is still active
4. SchoolSucks at www.schoolsucks.com is still active

Prestigious brick and mortar campuses such as Georgetown, Tulane, and the University of California's campuses at Berkeley, Davis, Los Angeles, and San Diego, have begun a proactive use of plagiarism detection software. Virtual universities such as Jones International University are purchasing software and emailing students to notify them that their papers could be scanned for plagiarism (Young, 2001).

- *New technologies.* Interactive websites, and the many security attachments being developed for the online ecommerce environment, offer the future possibility for giving assurance that an online student is actually the person participating in a class, taking a test, and interacting with fellow students. In fact, they offer greater assurance than in the online classroom. Who can track all the students in a 200+ student traditional classroom survey class? In fact, one of the faculty members noted that she had caught one student who came into a large class to take an exam for his fraternity brother by simply requiring a photograph from each student at the beginning of the semester—the proxy exam-taker was not a familiar face.

Among the well-advanced technologies showing promise are web cameras that actually show the student; biometric measurements such as hand, fingerprint, or retinal scanners; signature recognition systems, and pattern recognition systems that recognize a face. (With infrared scanners that detect heat patterns, a picture can't fool face recognition systems.)

- *Continual interaction.* It has always been the role of the instructor to provide guidance, feedback, and direction. When students are escorted through stages in the preparation of a research paper (proposing a topic, submitting a bibliography, doing progress reports) it is less likely that the student will be caught in a last minute bind and resort to unacceptable tactics to meet the deadlines of the course. (Fain & Bates, 2002).

- *Problem-Based Learning.* Presenting the student with a complex problem that can only be solved in stages, using a defined process, requiring specific knowledge, and often needing creative thinking. One example, which was used for physics students at MIT, was “Design a washing machine for use on the surface of Jupiter.” So long as the problem changes with each class, it is very difficult to “cheat” on such assignments.

CONCLUSION

Even now, however, information technology is preparing more challenges for educators and academic institutions. The same technology that allows automated correction of essays permits students limited research, format and writing of “research papers.” “Intelligent Agent” software searches for material, gives alternative selections, and makes suggestions for using that material which the “author” accepts or rejects. Accepting or rejecting material shaped by a software program, some may argue, does not meet the criteria of original work. Yet, others suggest the critical thinking skills used in the analytical process may be acceptable if the process itself, rather than the written results of that process, is being evaluated.

It is apparent that internet-based distance education as a methodology is still evolving, and practice of the art varies widely. Professors in higher education are experimenting with a wide array of techniques in order to preserve information integrity in the online environment. Current instructors perceive some increased risk of “cheating” in cyberspace classrooms, and some changes in the forms these incidents take. We anticipate the continuing evolution of new techniques and new technologies to assist us in the ongoing process of delivering, evaluating, and maintaining high-quality online educational programs.

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