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The Net Generation Cheating Challenge

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Academic integrity is the cornerstone of the best we have to offer in higher education. Integrity flourishes in an environment that encourages mutual respect, fairness, trust, responsibility, and a love of learning and that is maintained by safeguards like clear expectations, fair and relevant assessments, and vigilant course management (McCabe and Pavela 2004). Compelling evidence of widespread academic dishonesty among Net-Generation students threatens to undermine both the environment of trust that nourishes integrity and the safeguards that ensure it.

Net-Generation students' disregard of societal norms regarding academic honesty coupled with their nearly constant connectivity to each other can severely undermine assessment, whether it is done online or via more traditional methods (Exhibit 1). Our experience with unauthorized online quiz collaboration demonstrates how students can subvert the quality of online grading and how initial infractions can spread to pollute the learning environment, raising the question of whether the grades assigned are valid measures of what the enrolled student has learned. The results of our study reinforce the importance of using the latest technology to design a more secure learning environment and foster an appreciation for academic integrity.

The Net Generation and Cheating

As noted in a recent *Innovate* article (Garcia and Qin 2007), whether you call them millennials, electronic natives, or the Net Generation, college students in their mid-20s and younger are generally accepted as a generational cohort (Exhibit 2).

Two defining characteristics of Net-Generation students with important implications for online education are their technological savviness and peer connections. Net-Generation students "spend 72 hours per week of connected time by phone and IM, seeking advice and input on the smallest decisions" (Tyler 2007, 42). These two characteristics work in tandem as the availability of constant communication heightens the influence of peers. After 15 years of studying academic integrity and surveying thousands of students and faculty, McCabe (2005) concludes that the current high incidence of cheating is linked to these two important phenomena with peer culture representing the more significant factor in influencing the level of academic dishonesty. Indeed, sociological theorists suggest that students learn deviant strategies and adopt their peers' techniques and behavior as they communicate and form social relationships (Vowell and Chen 2004). If students perceive a "culture of cheating," they are more likely to engage in academic dishonesty (Anderman, Freeman, and Mueller 2007, 212) and view themselves as "chump[s]" for allowing ethical considerations to hinder academic achievement (Murdock and Stephens 2007, 248). Further, contextual cues can reinforce or weaken student perceptions of the importance of academic integrity to their academic communities and may factor greatly in their willingness to cheat (Exhibit 3).

Recent survey evidence indicates that college cheating is rampant and that students show little remorse (Poythress 2007; Cizek 2003). Twenge (2006, 27), like Callahan (2004, 14), views cheating among this generational cohort as widespread. A detailed examination of the characteristics associated with cheating suggests that "there is no clear-cut profile" because the behavior is so pervasive (Miller et al. 2007, 26). According to the Who's Who Among American High School Students' annual study of top U.S. teens, a record 80% of A-average students surveyed in 1998 admitted to some form of academic dishonesty (Bok 2006, 148). In a 2005 Web-based survey of over 50,000 U.S. undergraduates on 67 campuses, 26% of business students and 20% of the overall undergraduate population admitted to serious forms of exam

cheating in the past year (McCabe 2005). A more limited study focusing on digital cheating found a "completely different worldview" separating students and faculty with 90% of the students surveyed engaged in some form of net cheating (Berry, Thornton, and Baker 2006, 86). Cultural understandings of the boundaries of ethical behavior are changing in the context of new technology. Baby Boom-generation faculty were raised at a time when, for instance, stealing music from a local merchant constituted clearly unethical behavior. Today's student who is illegally downloading music operates within a very different and much more malleable framework; his behavior fits within a different peer worldview than that of the Baby Boomer who stole a tape from the neighborhood store. This different worldview is also evident in a 2006 survey of 36,000 high school students who responded overwhelmingly (97%) that "it is important for me to be a person with good character" while 60% indicated that they cheated during an exam in the past year (Vennochi 2007).

As one long-time researcher in the area of higher education and academic integrity states,

Adults always seem shocked and surprised to learn of cheating. . . . They shouldn't be so surprised. Research on cheating has shown over and over that most students do cheat, at least some of the time. Research in high schools shows that two-thirds of students cheat on tests and 90 percent cheat on homework. The figures are almost as high among college students. Furthermore, it is clear that rates of cheating have gone up over the past three decades. (Stephens 2004, ¶2)

In a recent issue of *Ethics & Behavior* devoted to the topic of academic dishonesty, the editor comments, "this special issue shows that the 'Internet revolution' facilitates new types of academic dishonesty" (Wowra 2007). An online survey of over 1,300 undergraduate students indicates that almost half (45.6%) reported using both conventional and digital methods to cheat (Stephens 2007). Furthermore, research suggests that cheating in high school is a strong predictor of cheating in college (Harding et al. 2007) and that cheating in college is predictive of future rule-violating intent (Lovett-Hooper et al. 2007). Given students' propensity to cheat for a variety of reasons (Davy et al. 2007), online coursework merely adds one more vehicle of potential academic dishonesty for a tech-savvy generation.

The difficulties of addressing the culture of cheating are exacerbated by the fact that as researchers recognized long before the arrival of the Net Generation (Bowers 1964, 193), the vast majority of cheating goes undetected and unpunished, and the magnitude of the problem is consequently grossly understated by the academic community (Haney and Clarke 2007, 262). Even though the problem of cheating is acknowledged to be substantially higher today, it is still largely ignored. As Bok (2006), a former president of Harvard University, notes, "enforcement on many campuses is deplorably lax and haphazard" (165). According to faculty self-reports, about half of all faculty members surveyed acknowledge ignoring incidents of cheating (McCabe 2005; Nadelson 2007). In fact, Callahan (2007) asserts that university players "have direct incentives to ignore the issue of academic integrity" (314). As Sperber (2005) points out, faculty are deterred from assuming this responsibility because time spent safeguarding the academic integrity of the learning environment is not a career-building activity generally valued by administration and it likely involves stressful interaction with students. For campus administrators who are recognized for their ability to tout the excellence of their programs and attract funding, addressing student cheating may appear to be a lose-lose situation (Callahan 2007, 315).

This lack of attention to academic integrity is unfortunate since decision theory suggests that low-probability events are often ignored (Rettinger 2007, 165) and that raising the likelihood of detection is the most effective way to deter cheating (Nagin and Pogarsky 2003; Thorkildsen, Golant, and Richesin 2007). Overall, the evidence suggests that current faculty inaction regarding improving course security practices contributes to an even greater incidence of student cheating (McCabe 2005).

Our Experience

With a student population comprised largely (90%) of members of the Net Generation, our mid-sized state university is a case in point. In a 2004 survey of over 800 undergraduate business students at our university, about 75% of participating students admitted to cheating in their courses. When the investigators narrowed the scope to online test cheating, 24% of the students admitted to past transgressions and 42% declared that they would cheat on electronic exams if given the opportunity (Chapman et al. 2004, 243). We experienced the repercussions of this culture of cheating in a hybrid introductory information systems class we taught to 300 students, predominantly sophomore and junior business majors (Exhibit 4). The course format included face-to-face lectures and labs that were supplemented by extensive online activities. We used weekly online quizzes to reinforce text material. The total of all quiz scores for the term made up 10% of each student's course grade. Each quiz was less than 1% of the course grade, and safeguards were instituted to generate questions randomly from a test bank and limit the time frame for taking the quiz.

Despite presenting explicit prohibitions and warnings to students in course policies and during the quiz login process, we discovered quiz response irregularities that implicated over 20% of the students (Exhibit 5) in possible cheating behavior. The quiz assessments were not a part of the class where we expected to detect any significant amount of cheating. The stakes on any one quiz were very low, the activity was relatively easy, and the material covered fundamental concepts and vocabulary essential to success in subsequent coursework. However, when a late-semester review of computer log files suggested suspicious activity, we performed a statistical analysis. Even though the rules reiterated at the beginning of each quiz specifically prohibited consulting with others, the analysis suggested that students were congregating on and off campus to take the quizzes together. After weighing the evidence, we pursued the most egregious cases of multiple infractions. The final result was the conviction of 15% of the students for online quiz cheating (Exhibit 6).
The collaboration we experienced is like the behavior described in a Boston College report on online cheating (Haney and Clarke 2007). Our data suggest a similar pattern of cheating, apparently spread by communication among students enrolled in the course. For example, a small number of our students stumbled upon a relatively minor system flaw that occurred when manipulating a browser session in an unusual way. This flaw caused information from one quiz session to overflow into another session. As in the Boston College situation, it took very little time for word of this potential cheating technique to spread among a large number of students. Unlike Haney and Clarke (2007) who collected data after the course was complete and found that 54% of the students admitted to exchanging answers and 79% said they were aware of online cheating, we became aware of the situation before the end of the semester and halted the online quizzing.
While investigating the pattern of cheating in our own course, we discovered that it is extremely time-consuming for a faculty member to detect and prosecute cheating. Overall, our experience (Exhibit 7) is consistent with research indicating instructors and administrators are reluctant to take action even against known cheaters (Murdoch and Stephens 2007).

Remedies

Online testing must be rigorously monitored if it is to measure student learning accurately. Many argue that the inherent difficulties in verifying the identity of test-takers necessarily limits the value of online testing to formative assessment or practice tests that have little weight in student grading. For example, Rowe (2004) suggests that "traditional one-location one-time face-to-face testing for much of the student's grade will need to be the assessment norm for distance learning in the foreseeable future" ("Conclusion," ¶1). However, the explosive growth in both the demand for and supply of online courses has led many educators to seek remedies to the problem of cheating in online assessment; our experience revealed a range of possible countermeasures to detect or, even better, deter cheating on online quizzes (Exhibit 8). The solutions, both those offered here as a result of our experience and the broader recommendations of researchers, can be grouped into three broad categories: technological solutions, content-based approaches, and behavioral methods. Each of these has its own advantages and disadvantages, and each comes with its own set of challenges and opportunities in implementation and maintenance.
Most technological solutions to the problem of cheating on online assessments focus on verification of the

test-taker's identity. These approaches range from basic password and certificate-based authentication methods to the use of sophisticated biometrics, such as fingerprint and retinal scans (Suzuki 2004; Fröhlich 2000). Some researchers have investigated using time as a tool to curb cheating, including manipulating the scheduling of assessments, the sequencing of questions, and the timing of responses (Schnipke and Scrams 2002; Wise and DeMars 2006). While verification of a test-taker's identity is feasible and cost-effective with current technologies, a more complex challenge is to verify that the test-taker is unassisted by others or unsupported by resources that are disallowed by the instructor. Electronic proctoring via web cams and/or microphones has been proposed as a partial solution to this problem (Pope 2007) (Exhibit 9).

Educators have investigated the use of instructional design to create cheat-proof exams. Carefully structured online assessments that use questions that are less vulnerable to cheating, such as essay questions, or that randomize question selections from a large pool of candidates can reduce cheating (Olt 2002; Rowe 2004). The use of flexible assessment techniques that concentrate on multiple, small, sequential, individualized assessments may also prove useful as a remedy for online cheating (Williams 2001; Williams et al. 2000). Though content-driven deterrent options are seemingly numerous, such measures often cost instructors valuable time (Exhibit 10).

Finally, some researchers are convinced that the only way to reduce cheating is to reshape student attitudes and perceptions about the assessment process. This can be achieved through establishing safe testing environments where there is a heightened perception of instructor vigilance, encouraging student participation in the creation of academic honesty policies, and fostering buy-in by convincing students to value assessments in the context of career or life goals (Austin and Brown 1999; Underwood 2003). Our own case serves to emphasize the need for measures beyond reinforcing the value of academic integrity in the immediate context of the classroom (Exhibit 11).

The remedies described here are by no means mutually exclusive (Exhibit 12). Effective instructional design can produce exams that are perceived by students as non-trivial exercises. Appropriate use of technology can impact student perceptions of instructor vigilance. As one human resource specialist aptly remarks, "The reality is that the future is technology-based, no matter what industry you point to" (Marston 2007, 109). Despite our failure, we believe online education has the potential to be on the leading rather than the lagging edge of creating high-integrity learning environments.

Conclusion

Both self-reports and observed incidents suggest that cheating is sufficiently pervasive among Net Generation students to distort the accuracy of grades assigned for coursework. The increasing importance of online education makes the quality of assessment a critical issue. Based on grades, students earn degrees, are admitted to advanced programs, and gain employment advantage. Academic dishonesty demoralizes and disadvantages those following the rules and undermines the credibility of higher education.

The concern of government, business, and educator stakeholders coupled with remarkable innovation in technology suggests that online course management is poised for a new era. Our challenge is to integrate technology in a manner that fosters respect, trust, mutual responsibility, and a love of learning while enhancing the integrity of individual competency assessments and tailoring controls to fit the circumstances. As McCabe (2005) declares, "Universities may provide our last chance to deliver a different message to young adults" ("Institutional Strategies to Promote Student Academic Integrity," ¶3). The good news is that the structure of the learning environment plays a central role in influencing the actions of the participants. "Since the environment is important and can be manipulated, there are interventions that can be used to improve student behavior" (Nadelson 2007, 9). Online educators are pioneers in embracing new paradigms. With new tools and creative applications, Web-based coursework can become a model of both academic integrity and excellence.

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