CAN EDUCATORS PREVENT A "WILD WEST" SCENARIO IN GIVING ONLINE EXAMS?

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This article discusses the necessity of using technology for exam proctoring in an era of increasing growth in online course delivery. The article discusses a recent generational trend affecting the rationalization leg of the "fraud triangle" generally used to model the conditions typically present in fraud, then discusses some advantages and disadvantages of three specific programs: Respondus Lockdown Browser and Monitor, Honorlock, and Examity. There are trade-offs in terms of cost and potential effectiveness that educators and administrators need to consider when choosing a deterrence program.

INTRODUCTION

Online education had grown substantially at all levels even before the pandemic suddenly made it imperative. After the world returns to "normal," some foresee online education remaining a significantly larger part of the total than before the pandemic. In addition to presenting challenges in delivering material, the growth in online education brings with it another primary concern: exam integrity. Once an exam goes online, the instructor almost completely loses control of student behaviors unless they take measures to curtail cheating attempts. According to a May 2020 survey by Wiley, 93% of faculty agreed that students were more likely to cheat online than in class. However, only 34% had implemented any proctoring to prevent cheating (The Wiley Network, 2020)

The propensity to engage in academic dishonesty could be modeled using the "fraud triangle," typically used by auditors and fraud experts to assess the likelihood of embezzlement or other fraud in an organizational context. The three legs of the triangle include motivation, opportunity, and rationalization. In an employment context, massive debts or the

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incentive to achieve higher income or status may lead to *motivation*. On the other hand, the *opportunity* must be there for the otherwise-motivated individual(s) to carry out their intentions. This opportunity generally presents itself as a weakness in the internal controls of which the person is aware, perhaps through years of experience in the system. Finally, rationalization occurs when the perpetrator can convince themselves (and perhaps a fellow perpetrator) that the act is actually "not so bad." For instance, one may believe they have been unjustifiably passed over for promotions or that there is no actual victim in their case.

Applying the fraud triangle to the academic context, virtually any student could be motivated to cheat due to external or internal pressures such as parental/guardian expectations or a perceived need to compete with other students for desirable job interviews. Opportunity is also present if the system does not prevent them from being able to carry out their intentions. Such companies as Chegg, Quizlet, and Course Hero have considerably facilitated the opportunity to obtain copies of questions or entire exams. Online exams inherently increase the opportunity to use such resources without technological monitoring. A recent *Washington Post* article (Newton 2020) notes that students have used Chegg, for instance, increasingly at many reputable universities, and many students were subjected to disciplinary action.

In an interesting review of academic literature related to academic dishonesty in online education, Adzima (2020) notes a disturbing trend. Specifically, studies note a cultural shift in which current students no longer even feel the need to justify their behavior. Instead, they feel entitled to receive more than they put into the educational experience (e.g., Stiles et al., 2018). If this is the case, then rationalization becomes less of a roadblock. As a result, reducing the opportunity to cheat becomes even more critical.

This article will discuss three programs designed to reduce the opportunity to cheat on exams. Respondus Lockdown Browser and Monitor, Honorlock, and Examity. The choice of a cheating-prevention method involves trade-offs, and careful consideration of the relative costs and benefits is essential, especially with budgets becoming even further constrained. Instructors can incorporate these effectively with leading learning management systems such as Blackboard and Canvas. All require students to use a webcam to take the exam so that videos are available. However, educators and administrators must consider important differences in cost and potential effectiveness. The following paragraphs will discuss some trade-offs concerning these three programs.

Respondus Lockdown Browser

Respondus Lockdown Browser and its companion, Respondus Monitor, involve a flat fee for each student per course and semester, or the university/college may pay for the service. It requires that a student download the Respondus software on the device used to take an exam. Then the program "locks down" everything except the exam itself so that students cannot bring up websites, other applications, or other documents on the screen. While taking the exam, the students cannot print or copy using the same computer. Learning management systems typically allow the instructor to see how long each student took for the exam and the time taken on each question. and when they took the exam. After the exam, videos of each student are available for the instructor to view as deemed necessary. Instructors can examine the scores, time stamps, and time taken as a "risk analysis" and then view videos, or assign a course assistant to do this review if one is available.

An important drawback for Respondus is that instructors do not receive reports "flagging" suspicious conduct of individuals so that a more efficient and targeted approach can be used. In addition, the program does not necessarily detect the use of a secondary device, such as a smartphone or a separate screen next to the student's computer screen. While a stu-

dent may appear to be looking off to the side, proving that the student is cheating based merely on that fact may be difficult. The instructor may spend significant unbudgeted time pursuing suspected cheating.

As stated in the Respondus Data Privacy overview, they do not "review videos after the exam," "store biometric profiles," "watch students live," "drop in on students during an exam," or "cross-reference network or location data of student" et cetera (Respondus Monitor, 2021, para. 6). This suggests that, while Respondus does capture a student photo, student ID, and room scan prior to an exam, there is not an automated process for validating the identity of the person taking the exam. Such identity validation is a crucial issue because students have admitted to hiring others to take an exam for them (Wolverton, 2016).

Notably, Respondus recently introduced a new "Instructor Live Proctoring" option that is particularly useful for small classes, specifically for cases in which the exam is open for all students during a specific (limited) time slot. This option lets instructors observe students' live exam-taking experience using a video conferencing system (Zoom, Microsoft Teams, or Google Meet). While the Lockdown Browser forces the student to stay on the exam itself, the instructor can watch students' behaviors, such as continually looking to the side or talking with someone. This system offers potential for in-class courses. The instructor would normally administer exams in the classroom but is temporarily giving the exam online due to the pandemic or some other reason. However, it would be less practical for purely online courses that have a large class size, or that may offer a wider "window" of availability that covers two or three days.

Honorlock

The use of Honorlock for online exams does not require a software download; however, it requires the student, when taking the exam, to use the Google Chrome browser with an installed browser extension. Suppose a student attempts to take an exam enabled in Honorlock using another browser. In that case, the program will ask for an access code, thus preventing the student from taking the exam using another browser. When using Honorlock, the instructor has complete control over the proctoring settings used during the exam. For example, the instructor may require the student to show a photo ID and have it captured by the system before the student can begin the exam. The instructor can also establish other proctor settings such as recording the students testing environment using a webcam, recording the student's screen during the exam, recording the student's internet activity (web traffic) during the exam, and recording a full room scan before the student can begin taking the exam. In addition, Honorlock can be set to limit browser activity using a browser guard function similar to Respondus.

Another feature built into the system includes the "Search and Destroy" feature. Honorlock will take the instructor's test questions and search the internet for all websites containing those questions/answers. They file legal take-down notices to each website on the instructor's behalf. Honorlock has some ability to detect secondary device usage by using their patented "Multi-Device Detection" algorithm to detect additional devices trying to access the questions/answers on secondary devices during the exam. While not foolproof, this adds an additional layer of protection for exam integrity.

The artificial intelligence used in the Honorlock software records all exam violations or technical issues experienced by the student during an exam. If there are multiple violations/technical issues, the artificial intelligence will prompt a "Live Pop-in," which means a live remote proctor will pop into a student's exam session to resolve the issue. If their actions indicate an exam violation, the live proctor may ask the student to rescan their exam environment and remove unauthorized materials. If due to technical issues, the live proctor will try to assist the student in troubleshooting the issue (Honorlock, 2021a).

Honorlock stores images of the exam taker and the ID used for identity verification for a short amount of time to verify the identity of the exam taker (Honorlock, 2021b). After an exam period has ended, a live proctor from Honorlock will (1) review the student photo and verify that it matches the ID they provided and (2) review the ID and verify that it matches the name of the person who is registered to take the exam, and (3) review the video for each student and adjust the artificial intelligence flags, as necessary, to ensure all questionable activity is noted, such as having someone else in the room or constantly looking down. The instructor will receive an email from Honorlock after the proctor has completed their exam review, with names of students who were flagged and the specific exam questions on which behavior was the most questionable. This process allows the instructor to focus on the significant exam violations rather than watching every student exam video, which is more efficient for reviewing the questionable student activity captured while taking the exam.

A comparative disadvantage to Honorlock relative to Respondus Lockdown Browser is that if the instructor allows students to review what they missed at the end of the exam, there is no review once a student submits the exam. Respondus allows the instructor an option to require the lockdown browser once the exam is over if the student wants to review the results. However, we should note that there are sometimes functionality issues with this setting. With Honorlock, a student can spend as long as desired taking pictures of questions without the instructor's knowledge, which could increase the ability to share exam questions either with those in the same course who are taking the exam later within the "window" or with those taking the course in a subsequent semester.

As with Examity, discussed below, some students find programs such as Honorlock and Respondus to be an invasion of privacy. Students and digital rights activists have pushed back against these programs at schools such as the University of Wisconsin -Madison and San Diego State University (Paykamian, 2021).

Examity

Examity is generally more costly than Respondus and Honorlock because it offers the use of a live proctor but at an additional cost. Using the Live Proctoring option, an instructor will "register" an exam with Examity. A student must create an Examity Profile and schedule a specific time (within the testing window) with Examity to take the exam. Then Examity will schedule a live proctor to observe the student taking the exam online. The proctor can take control of the student's screen. The student cannot begin until the proctor releases the exam after being satisfied with the identification offered by the student and with the scan of the student's work area. During the identification process, the live proctor manually verifies the student's identity who is taking the exam against the ID provided and the course roster. Once the exam has been released to the student, the live proctor will watch the student take the exam in real-time. After the exam period, an Examity staff person reviews all recordings and adds flags to suspicious behavior before sending an email summary report to the instructor. It is generally thought that Examity provides the best deterrent to cheating on online exams, although it is the most costly to utilize of the three we compare.

Some aspects of Examity that tend to be strengths from the instructor perspective, in our experience, have led to student complaints via email messages and comments written in instructor/course evaluations. For instance, some students have provided negative feedback regarding using a live proctor during an online exam. A proctor may ask them in the middle of an exam to interrupt what they are doing and move some notebooks, which students may find invasive. Students also did not like to schedule the exam at a specific time, which is especially a concern for students scrambling to work in an exam with their schedule. In one case, when Examity took con-

trol of the student's computer, the student was concerned about whether or not the proctor had access to personal files stored on the computer.

What Else Can We Do?

In addition to using proctoring software, many testing programs and learning management systems allow for a random selection of questions so that every student's exam is different. Creating a different exam is particularly efficient if the instructor has the program pull questions from an existing test bank without worrying about the nature of the questions. One caveat, however, is that fairness issues could arise. For example, one student may receive more calculation questions than another, thereby creating more time pressure for that student relative to others. To address this concern, learning management systems and other programs often allow instructors to create separate banks, some with and some without calculations. The instructor can then have the program select a specific number of questions from each category. While this partially addresses the fairness issue and provides for some variety, it is far less efficient because it is generally necessary for the instructor to select questions individually from each category.

Discussion/Conclusions

If students are willing to cheat in an academic context, it seems probable that they would also cheat as an employee if given sufficient opportunity. Of course, this has implications for any profession or organization that stresses integrity. Despite objections by students, using technology to assist in proctoring online exams is important in maintaining exam integrity and for the reputation of an academic program or university. Even some noncheating students have complained that cheating occurs and that they are at a disadvantage. There are trade-offss, however, in terms of cost and effectiveness. As with most products/services, the idea that "you get what you pay for" is valid for these programs. As effectiveness goes up, the cost likely will increase as well. There is no perfect solution for everyone, despite some impressive features. Particularly for schools with limited operating resources, it is essential to decide how effective they can afford to be. Educators and administrators must also consider the effect on students' perceptions and whether student objections at their school are sufficiently valid to warrant reconsideration of a particular option.

We should note here that these programs and others are continuously changing due to educators' needs, technological advancements, and competitive necessities. There could be recent enhancements of which we are not aware; these perceptions are based mainly on direct recent and past experiences in undergraduate and graduate business/accounting courses. Furthermore, we have used one learning management system that may, in part, contribute to issues we have encountered. In addition, it is sometimes possible for administrators to negotiate favorable terms with providers due to such factors as larger enrollments. Therefore, we intend this analysis only to stimulate thought when deciding among deterrence options.

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