



RESEARCH BRIEF: ONLINE EXAM SECURITY

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In the following report, Hanover Research presents an overview of current trends and recommended practices regarding online exam security at U.S. higher education institutions. The report is based on recently published secondary literature and a high-level review of current practices at U.S. universities and law schools.



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RECOMMENDATIONS AND KEY FINDINGS



PROCTORING IS GENERALLY AN EFFECTIVE WAY OF DECREASING FRAUD

Recent studies have shown that proctoring tests or exams is an effective way of lowering the risk of cheating. In fact, students may consider cheating more acceptable in an unproctored environment and place responsibility for personal misconduct on the institution for not having administered the exam more securely. Similarly, reminding students of what constitutes academic misconduct and specifying the consequences can be effective in minimizing exam fraud.



COMMON REMOTE STRATEGIES INCLUDE LOCKDOWN BROWSERS AND WEBCAM PROCTORING

Remote proctoring can be live, recorded, or automated. Such monitoring may rely exclusively on human supervision (e.g., live via webcam) or be made possible through Artificial Intelligence (AI). Several commercial providers offer these types of services, and the remote proctoring industry has been growing quickly. Many institutions use “lockdown browsers” which prevent online searching or similar activity while the exam is live. However, some stakeholders have raised privacy concerns, as well as concerns about whether these types of services meet accessibility standards or provide value commensurate with their cost.



INSTITUTIONS MAY WISH TO CONSIDER ALLOWING ALTERNATE LOCATIONS FOR EXAM TAKERS

Prior to the COVID-19 pandemic, institutions regularly allowed students taking online courses to complete tests at approved locations (testing centers, libraries, etc.) near the student’s residence. This method is more likely to allow for social distancing than a large group exam, but does not carry the same privacy and cost concerns of using online monitoring.



EXAM DESIGN AND EXAM MECHANICS MAY FURTHER DECREASE THE RISK OF CHEATING

It is generally more challenging to cheat when required to answer open-ended questions. Reviewed authors and institutions further recommend to make an exam available only at a specific time and to set time limits. Moreover, randomizations of questions and showing only one question at a time may further decrease the likelihood of cheating.

TRENDS AND CHALLENGES

TRENDS AND CHALLENGES IN ONLINE EXAMS

The continuous expansion of online offerings at U.S. higher education institutions, accelerated and intensified by the ongoing COVID-19 pandemic, has also raised questions and concerns over online exams.



A central concern surrounding online exams pertains to students' academic integrity and/or honesty ([NCTA](#)). Recent research has shown that, in order to discourage or prevent students from cheating, proctoring tests or exams is vital. In fact, proctoring is not only an effective way of decreasing fraud but also plays an important role for students' attitudes and behavior. "[...] when a test is not proctored, students perceive cheating as more acceptable and are more likely to cheat or commit test fraud, all the while placing the responsibility on the institution to more securely administer the test" ([NCTA](#); [Reisenwitz](#)).



Online tests and exams may be delivered through an institution's Learning Management System (LMS), and/or monitored through online, remote, or automated proctoring tools or services ([Inside Higher Ed](#)). The scale of control may range from requiring authentication of a student's identity to using a Lockdown Browser to proctoring an exam through either humans or computers.



Higher education institutions typically use a range of tools to increase the security of online exams ([WICHE](#)). A high-level review of national institutions indicates that the use of *Respondus LockDown Browser* is fairly common. Several universities have conducted pilots with vendors to assess the outcomes and usefulness of online proctoring services ([Cornell](#); [WICHE](#)). While some institutions have established partnerships with commercial proctoring providers (e.g., [Uillinois](#), [UDayton](#), [ASU](#)), others remain skeptical due to costs or concerns about privacy and accessibility (e.g., [Lehigh](#), [UC Berkeley](#)).



In addition to ensuring academic integrity, institutions need to consider students' privacy protections ([Forbes](#)), accessibility for students with disabilities (i.e., compliance with ADA), test anxieties ([Inside Higher Ed](#)), and the potential financial costs for both the institution and students ([WCET](#); [Educause](#)). Moreover, some observers suggest that not all students may have the relevant software and/or hardware to take an online exam off campus or outside a designated location.

ACADEMIC INTEGRITY



✓	Define Academic Misconduct/Dishonesty	<ul style="list-style-type: none"> The institution / Faculty should provide students with a clear definition of academic integrity and outline which behavior constitutes academic misconduct (TimesHigherEd; GWU). Some authors believe that students are less likely to cheat “when they are invited to demonstrate learning in ways that are most authentic to them” (Inside Higher Ed; Pitt).
✓	Code of Conduct / Honor Declaration	<ul style="list-style-type: none"> Some institutions have expanded their institutional honor codes by including statements on academic integrity in online courses and remote exams (e.g., University of Oregon; FAU). Cornell has issued a new document on academic integrity that addresses virtual instruction (Cornell). Relevant passages should be included in online course information and syllabi.
✓	Learning Management Systems	<ul style="list-style-type: none"> For high-stakes exams, institutions may consider LMS and additional set-ups (see exam design, exam mechanics, etc. and p. 6)
✓	Exam Design	<ul style="list-style-type: none"> Faculty should ask open-ended questions (e.g., long or short essay questions) as they are more difficult to answer by a quick online search (Clemson; IU). In addition to conventional search engines, faculty need to be aware of easily available online sources that may increase the risk of cheating (e.g., Quizlet; Chegg).
✓	Exam Mechanics	<ul style="list-style-type: none"> Making the exam available only at a specific time and setting time limits for the exam can discourage students from peer-sharing and looking up answers (IU). Randomization of questions and showing only one question at a time may further decrease the likelihood of cheating (Williamson).
✓	Technological and Online Tools	<ul style="list-style-type: none"> Margaret H. Williamson (University of North Georgia) recommends disabling the right-click option in the LMS as it prevents “the student from copying and pasting.” Moreover, she uses the <i>Respondus Lockdown Browser</i> which “prevents students from printing, copying, going to another website or accessing other applications during an exam” (Williamson). Western Governors University (WGU) has developed a web crawler (Owlbot), custom built to WGU specifications, that removes online content that may facilitate cheating through an online search during an exam (WGU).
✓	Remote Proctoring	<ul style="list-style-type: none"> Online exams may be monitored by humans or by computers (U.S. News). Some institutions use Zoom to watch students via webcam (Duke University).
✓	Storage	<ul style="list-style-type: none"> Institutions need to have policies in place that stipulate how and where online exams are being stored.

PROCTORING MODELS, TOOLS, AND SERVICES



✓	Categories of Remote Proctoring	<ul style="list-style-type: none">• Remote proctoring can be live, recorded, or automated. While live and recorded proctoring typically still requires human supervision and/or review, automated proctoring relies increasingly on Artificial Intelligence (AI) (Campustech).• Some institutions allow volunteer proctors to monitor online, closed-book exams (JHU), or offer students the option to take an exam at pre-approved sites off campus or at an appropriate venue (e.g., school, library, church) in the vicinity of the student's residence (e.g., NCSU; UNL; GMU; UNC; TTU).• Commercial proctor services can generally be divided into auto authentication, live authentication, automatic proctoring, record-and-review proctoring, and live proctoring (Inside Higher Ed).• Some institutions provide distance education students several options, i.e., students can choose to take an exam on campus, at a pre-approved testing site, or through a third-party remote proctoring services provider (Inside Higher Ed)
✓	Features of Proctoring	<ul style="list-style-type: none">• Institutions / Proctors need to verify a candidate's identity. Students may identify themselves by "holding up an ID to the camera or through other kinds of checks, such as biometric authentication, including facial recognition. Alternatively, students may be asked to type a short phrase so their keystrokes can be analyzed [...]." (Educause)• For remote proctoring, proctors may use "a web camera to view the candidate's physical environment to ensure that only approved materials [...] are permitted during the examination process," request "to view the candidate's physical environment at frequent intervals," adhere "to any applicable time limits," use "software to limit the functionality of the test taker's computer, and ensure "that test takers are not permitted to leave the test environment during the test session" (ACE).
✓	Pricing & Fee Schedule	<ul style="list-style-type: none">• Pricing may vary substantially across commercial proctoring providers.• Students need to know whether they are responsible for any fee payments should they take an exam through a third-party provider.

PRACTICES AT NATIONAL UNIVERSITIES



✓	Guidelines and Documents	<ul style="list-style-type: none">• Institutions that offer students the opportunity to take an exam online and/or at a remote location should require students to acknowledge the institutional academic integrity and conduct statement (e.g., UNC).• Some institutions ask that faculty include information about “equipment information, opt-out procedures, expectations, and proctoring service details” in the syllabus (UNM).• Institutions typically explain which software and applications they use for online/remote exams. Detailed explanations of necessary equipment (e.g., webcam), requirements (e.g., installation), terms of agreement (e.g., collection of biometric data), deadlines, and other relevant information are important for faculty and students (e.g., Baylor).• Instructors may find it helpful if their institution provides them with a “Best Practices” guide for online testing (e.g., Drake University) or suggests methods to reduce cheating in online examinations (e.g., GWU).
✓	Lockdown Browser	<ul style="list-style-type: none">• A high-level review of national universities indicates that lockdown browsers are a commonly used tool in online tests and exams delivered through Learning Management Systems (LMS). The application prevents students from browsing, printing, copying, and pasting (e.g., Baylor).
✓	In-House Tools	<ul style="list-style-type: none">• Central Florida and Western Governors (WGU) have developed their own tools to monitor online exams or WGU copyrighted material online (ProctorHub; Owlbot).
✓	Commercial Service Providers	<ul style="list-style-type: none">• The ongoing COVID-19 pandemic has caused a surge in universities requesting the services of remote proctoring providers (Inside Higher Ed).

FURTHER CONSIDERATIONS AND CHALLENGES



✓	Privacy	<ul style="list-style-type: none">• Privacy concerns among students are a recurring issue in articles about online and remote proctoring services. Third-party proctoring service providers may collect a student's name, address, passwords, and even biometric records (Verge; NY Times; UD Review).
✓	Accessibility	<ul style="list-style-type: none">• A recent survey has found that “quite a few” remote proctoring services do not meet “accessibility standards” (Educause).
✓	Costs	<ul style="list-style-type: none">• 58.0 percent of recently polled institutions stated that costs of remote proctoring constitute a challenge (Educause).

OVERVIEW OF VENDORS

The vendors listed below have been repeatedly cited in secondary literature and/or are being used by national institutions of higher educations. Please note that this overview is for information purposes only and does not represent a recommendation or an endorsement.

Vendor / Tool	Services / Functions	Notes
<u>Examity</u> Newton, MA	<ul style="list-style-type: none"> • Online proctoring 	<ul style="list-style-type: none"> • Testimonials from Indiana University • Reportedly one of the “fastest-growing online-proctoring services” (<u>Verge</u>)
<u>ExamSoft</u> Dallas, TX	<ul style="list-style-type: none"> • Exam Security • Exemplify • Remote Proctoring 	<ul style="list-style-type: none"> • Seattle Law School, Lewis & Clark Law School, Vermont Law School, and California Western Law School have used ExamSoft and/or Exemplify.
<u>Honorlock</u> Boca Raton, FL	<ul style="list-style-type: none"> • On-demand proctoring • LMS integration 	<ul style="list-style-type: none"> • Testimonials from University of North Alabama, Longwood University, University of Florida
<u>Pearson VUE</u> Bloomington, MN	<ul style="list-style-type: none"> • At-home testing / Online proctoring 	<ul style="list-style-type: none"> • Testimonial from Juniper Networks
<u>Proctorio</u> Phoenix & Scottsdale, AZ	<ul style="list-style-type: none"> • Remote proctoring • LMS integration 	<ul style="list-style-type: none"> • Claim to work with over 400 universities, institutions, and corporations, including Duke University, Columbia University, Georgetown University, and others
<u>ProctorU</u> Birmingham, AL	<ul style="list-style-type: none"> • Remote proctoring through AI • LMS integration 	<ul style="list-style-type: none"> • Testimonials from University of Mississippi, Western Governors University, Georgia Southwestern University, and others
<u>Proctortrack</u> New York, NY	<ul style="list-style-type: none"> • Remote proctoring (four different levels, including browser lock, fully automated, live proctor with Artificial Intelligence) • LMS integration 	<ul style="list-style-type: none"> • State to be FERPA compliant • Testimonials from Rutgers University, St. George's University, and Broward College
<u>PSI</u> Glendale, CA	<ul style="list-style-type: none"> • Remote proctoring 	<ul style="list-style-type: none"> • Testimonials from University of Alaska Anchorage, University of South Alabama, and others
<u>Respondus</u> Redmond, WA	<ul style="list-style-type: none"> • LockDown Browser • Fully-automated online proctoring for remote testing • Test bank network • <u>More</u> 	<ul style="list-style-type: none"> • Testimonials from Central Michigan University, Northeastern State University, Drexel University, University of Toledo, and others

BENCHMARKED INSTITUTIONS

Institution	Recommendations / Tools / Vendor Partnerships	Notes
Baylor University Waco, TX	<ul style="list-style-type: none"> • Respondus Lockdown Browser • Respondus Monitor • Proctorio 	<ul style="list-style-type: none"> • Online Test Proctoring
Brown University Providence, RI	<ul style="list-style-type: none"> • For high-stakes exams, University recommends Top Hat Test which randomizes question order and includes lock-out feature 	--
Columbia University New York, NY	<ul style="list-style-type: none"> • Exemplify 	<ul style="list-style-type: none"> • Law School used Exemplify in Spring 2020
Drake University Des Moines, IA	<ul style="list-style-type: none"> • Best Practices 	--
Duke University Durham, NC	<ul style="list-style-type: none"> • Testing Center offers online proctoring services through Zoom 	--
Harvard University Cambridge, MA	<ul style="list-style-type: none"> • Proctorio 	<ul style="list-style-type: none"> • Move to open-book exams and reliance on honor code
New York University New York, NY	<ul style="list-style-type: none"> • Exam 4 • Proctor U 	<ul style="list-style-type: none"> • NYU Law School states that it is “pilot testing a method of examining online using Exam4 and a live proctoring service, ProctorU” since fall 2014 (NYU).
University of Central Florida Orlando, FL	<ul style="list-style-type: none"> • ProctorHub 	<ul style="list-style-type: none"> • University developed tool internally (UCF)
University of Pennsylvania Philadelphia, PA	<ul style="list-style-type: none"> • Canvas • ProctorU 	<ul style="list-style-type: none"> • UPenn has discouraged “use of remote proctoring services or using tools like Zoom or Bluejeans” during COVID19-pandemic (UPenn). • Students need photo ID, webcam, and a quiet, well-lit room to take the test
Yale University New Haven, CT	--	<ul style="list-style-type: none"> • In response to the COVID-19 pandemic, the “Poorvu Center and Yale College have recommended against the use of third-party remote proctoring services to administer assessments” (Yale).



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