Remote Proctoring: CETE / WebXam™ Outline of Topics (09/15/20)

Given the current COVID situation and widespread closures, there is a focus in many sectors of testing and assessment (including clinical, counseling, credentialing, educational, and personnel selection) on continuing to test, which brings issues of test security for mid- to higher stakes situations front and center. Additionally, there are major issues of access and equity associated with remote testing. **This outline is NOT exhaustive and is intended to provide a brief overview of the topic, some of the cross-cutting issues, a list of vendors with some of their features (from website reviews or shared information, and a bibliography that CETE staff constructed over time.**

Test delivery with AND without proctors allows theft of IP (intellectual property: items, keys, rating scales), therefore test security is a source of concern for test developers, test users, and even test-takers (cheaters or non-cheaters, because scores may be less valid when used in "decision-making" for educational, employment, or credentialing). This is especially true in high-stakes testing, where the incentive to cheat is higher and the consequences of compromised testing can have severe consequences. It can be described as a leakage of validity over time.

Test Security: pirate & cheater "roles" or sources of danger
> --Pirates harvest items to make available to others (small- or large-scale): Insider & Outsider threats
> --Cheaters are test-takers who use materials to score higher on the test (NOTES: a) test-takers may be pirates if they get registered for an exam for the sole purpose of harvesting item content, and b) some cheating involves answer copying without pre-knowledge of item content)
> --An informative Caveon graphic (2005) on roles/threats to IP is at (https://caveon.com/2005/02/08/risk-management-catch-me-if-you-can-the-top-ten-cheaters-on-high-stakes-exam/)

A growing concern focused on test-takers is privacy, especially for remote proctoring involving minors during the COVID-19 pandemic. Special issues with minors include local laws about recording minors (as many remote proctoring systems record video of the test) as well as contact with live proctors that may have not been screened to have contact with minors. There are organizations addressing the issue (Association of Test Publishers is one of the main trade associations, and scans U.S., Europe, and many other regions for issues related to testing, such as the EU GDPR). ATP just held a test security summit and concurrently shared a document entitled *Privacy Guidance When Using Video in the Testing Industry* (2020). Although this outline focuses on test security, issues of the digital divide, cost, and access issues will be important to consider so that equity is not harmed. In the educational setting, urban and rural school districts may suffer due to these considerations.

An excellent framework proposed by Ferrara (2017) consists of three sets of concepts, <u>elements, stakeholders, & temporal</u> (before-during-after); the elements are abbreviated PDIR: Prevention, Detection, Investigation, Resolution.

Models for Remote Proctoring include
> --Record-review
> --AI standalone
> --AI+CallAPerson
> --Live in-person

Vendors: Examity, MonitorEDU, ProctorU, Proctorio+Cirrus as partner (see table below)
> --Some variation exists in whether a vendor forces use of their delivery platform versus allows for integration with other delivery platforms

Considerations: technology, cost, privacy, proctor training, # test-takers monitored simultaneously
      EX: MonitorEDU: $15 per test on laptop/tablet with some discounts available
      Self-service proctoring is an option offered by this provider (https://ssp.live/)

Validity or effectiveness: NOT much out there yet, but a proctoring organization should allow the client to try to "hack the system" or use secret shoppers (send test-takers who are told to cheat, to see if remote proctor detects) – there are ongoing projects in the certification sector (Institute for Credentialing Excellence, ICE, is conducting one to ascertain whether remote proctoring is acceptable for accreditation quality standards, and ANSI is copying this model with its own pilot).

In terms of the research literature, Wollack & Fremer (2013) edited a comprehensive handbook of test security, and the International Test Commission produced a globally-focused set of standards on test security (ITC, 2014). Given the importance of psychometric and IT "forensics" to ID possible cheaters, pirates, & sketchy locations: time on item, time on test, other patterns (appropriateness measurement), or scores – there are many technical sources. An early article by Foster, Maynes, & Hunt (2008) as well as two 2011 articles by Gorham & Woo and Garcia & Woo talk about forensic analyses, while a recent article by Hurtz & Weiner (2019) compared a suite of psychometric estimates. Additional guidance is provided by Kingston & Clark (2014) and Cizek & Wollack (2017), both focused on quantitative methods for detecting test security breaches.

Merits of waiting: more time to figure out, costs may decrease over time (although, with new normal it might be a time to gouge clients).

"Home-brew" System: Zoom with teachers as proctors (might lead to piracy on the part of proctors), OR Microsoft Windows 10 Feature "Take-A-Test" (https://docs.microsoft.com/en-us/education/windows/take-tests-in-windows-10).

We believe that Caveon is the best specialist firm with respect to test security (https://caveon.com) – their leadership is demonstrated in several compelling letters written by CEO Dr. David Foster earlier this year warning of the risk of remote proctoring during the COVID-19 pandemic (available at the website) – and a recent no-cost series Test Security "Bootcamp" with three actionable workplans (Preparedness-Planning, Technology, and Evaluation). Caveon offers a suite of services that currently includes:
      Consulting on test security
      Data forensics
      Investigation services
      Secure exam development
      Web patrol (searching for your items around the web and at brain-dump sites)

Remote proctoring vendors as of August 2020 (no guarantee of exhaustive listing nor of accuracy in pricing)

Vendor	Website	Contact	Compatible (Chromebooks)	Levels of proctoring available	Compatible with external test delivery system?	Examinee requirements
MonitorEdu	monitoredu.com	info@monitoredu.com; 24/7 online chat	Yes	MobileProctor (smartphone video chat), MobileProctor Plus (smartphone + webcam or webcam + second camera), Proctor Exam Live (no smartphone needed) Self-service Proctoring another option)	Yes	Proctor Exam Live: computer only; MobileProctor: smartphone and computer; MobileProctorPlus: smartphone and a laptop with a webcam. All require internet connection.
Proctorio	proctorio.com	hello@proctorio.com; (866) 948-9087	Yes	Automated, Live, Professional Review Proctoring; Automated or Live ID Verification	Yes	Computer with webcam and internet connection
HonorLock	honorlock.com	support@honorlock.com; (844) 243-2500; 24/7 online chat	Yes	?	Yes	Computer with webcam and internet connection
SmarterProctoring	smarterservices.com/ smarterproctoring	(877) 499-7627; online form at smarterservices.com/conta ct	Yes	SmarterID (facial recognition to validate identity and attendance); SmarterProctoring (options include Virtual Proctoring, Human Proctoring)	?	Computer with webcam and internet connection
ProctorU	proctoru.com	Online form at proctoru.com/contact-us	Record and Review- yes; Live- no	Record, Review, Live	Yes	Computer with webcam and internet connection
ProctorTrack	proctortrack.com	(844) 753-2020; support@verificient.com; online chat at proctortrack.com	ProctorLock, ProctorAuto, and Proctortrack QA- yes; ProctorLive AI- no	ProctorLock (just locks down browser), ProctorAuto, Proctortrack QA, ProctorLive AI	?	Smartphone and a computer with webcam and internet connection

Vendor	Website	Contact	Compatible (Chromebooks)	Levels of proctoring available	Compatible with external test delivery system?	Examinee requirements
Examity	examity.com	(855) 392-6489; info@examity.com; online form at examity.com/contact-us/	No	Standard Automated; Premium Automated (flagged violations with video and human audit); Live standard (live check-in only; rest is recorded and auto-proctored); Live Premium (proctor supervises entire test)	Yes	Computer with webcam and internet connection
Mettl	mettl.com/en/online-remote-proctoring/	(858) 260-3322; contact@mettl.com	No	Basic (AI proctoring), Basic+ (record and review), Advanced (Live Human-led)	Yes	Computer with webcam and internet connection; low-stakes tests may be taken on a smartphone
PSI Services- PSI Bridge (Software Secure)	psionline.com/platforms/psi-bridge/	Online form at psionline.com/contact/form?tab=sales	No	Record and Review Service; Live Remote Proctoring	Yes	Computer with webcam and internet connection
Pearson VUE - OnVUE	home.pearsonvue.com/Test-Owner/Deliver/Online-proctored.aspx	Online form at home.pearsonvue.com/Test-Owner/Contact-business-development/Email-form.aspx	No	?	?	Computer with webcam and internet connection
Respondus	web.respondus.com	Online form at web.respondus.com/contact/faculty-staff-form/	?	Lockdown Browser, Respondus Monitor AI Proctoring	Requires a compatible LMS	iPad or Computer with webcam and internet connection
Loyalist Exam Services	loyalistexamservices.com	exams@loyalistexams.com; online form at loyalistexamservices.com/contact-us-s32.php	?	Live proctoring	?	Computer with webcam and internet connection

Bibliography

Association of Test Publishers (2020, June). *Privacy guidance for using video in the testing industry.* Washington DC: Author.

Cizek, G. J. (1999). *Cheating: How to do it, detect, and prevent it.* Mahwah, NJ: Erlbaum.

Cizek, G. J., & Wollack, J. (Eds.). (2017). *Handbook of quantitative methods for detecting cheating on tests.* New York: Routledge.

Ferrara, S. (2017). A framework for policies and practices to improve test security programs: Prevention, detection, investigation, & resolution (PDIR). *Educational Measurement: Issues and Practices, 36(3),* 5-23.

Foster, D., Maynes, D. & Hunt, B. (2008). Using data forensic methods to detect cheating. In C. L. Wild & R. Ramaswamy (Eds.), *Improving testing* (pp. 305–321). New York: Lawrence Erlbaum.

Fremer, J. J., & Ferrara, S. (2013). Security in large scale, paper and pencil testing. In J. A. Wollack & J. J. Fremer (Eds.), *Handbook of test security* (pp. 17-37). New York: Routledge.

US Department of Education. (2013). *Testing integrity symposium: Issues and recommendations for best practice.* See http://nces.ed.gov/pubs2013/2013454.pdf

Garcia, M., & Woo, A. (2011). The role of security in today's testing programs. CLEAR Exam Review, XXII(3), 16-19.

Georgiadou, E., Triantafillou, E., & Economides, A. (2007). A review of item exposure control strategies for computerized adaptive testing developed from 1983 to 2005. *Journal of Technology, Learning, and Assessment, 5*(8). Retrieved 11-28-2011 http://www.jtla.org.

Gorham, J., & Woo, A. (2011). The importance of data forensic applications in today's large scale testing programs. *CLEAR Exam Review, XXII*(1), 15-17.

Government Accountability Office (2013, May). *K-12 education: States' test security policies and procedures varied* (GAO-13-495R). Washington, DC: Author.

Harpp, D. N., & Hogan, J. J. (1993). Crime in the classroom: Detection and prevention on cheating on multiple-choice exams. *Journal of Chemical Education, 70,* 306-311.

Harpp, D. N., Hogan, J. J., & Jennings, J. S. (1996). Crime in the classroom part II. An update. *Journal of Chemical Education, 73,* 349-351.

International Test Commission (2014, July). *The ITC guidelines on the security of tests, examinations, and other assessments (Ver. 1.0).*

Kingston, N. M., & Clark, A. K. (Eds.). (2014). *Test fraud: Statistical methods for detection and methodology.* New York: Routledge.

McClintock, J. C. (2016). Reduction in cheating following a forensic investigation on a statewide summative assessment. *Applied Measurement in Education, 29,* 132-143.

National College Testing Association (2014, June). *Professional Standards and Guidelines for post-secondary testing centers.*

Wesolowsky, G. O. (2000). Detecting excessive similarity in answers on multiple choice exams. *Journal of Applied Statistics, 27,* 909-921.

Wollack, J. A., & Fremer, J. J. (Eds.). (2013). *Handbook of test security.* New York: Routledge.