Eyes on **Integrity** A Comparative Look at Online **Proctoring** Models

Software SECURE

Learn about the pros and cons of **live, automated** and **on-demand** remote **proctoring** technologies.

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Eyes on Integrity

A Comparative Guide to Online Proctoring Models

What You Need to Know

As the demand for online education increases, institutions are being challenged by how to effectively verify the validity and quality of their online programs.

Proctoring exams is a key component of establishing a credible online education program; when a program's assessments are secure, institutions can trust that student performance on exams is an accurate representation of learning and not the result of cheating.

This eBook will investigate the pros and cons of Live, Automated and On-demand proctoring models.

Strategies Driving the Environment

The strategies that drive proctoring in today's online learning environment vary widely. Most institutions opt for one of three approaches: Live web proctoring, which requires students to have a human proctor on the other end of their webcam at a specific time, automated proctoring which uses technology alone to detect whether or not a student is cheating, or on-demand web proctoring, which embraces and leverages technology, only involving humans where they can be the most effective.

This paper investigates the pros and cons of each approach, comparing and contrasting the three in a way that helps readers determine which strategy will work for them. It also will spotlight the growing need for a proctoring system that is scalable, convenient and cost-effective.

After reviewing the pluses and minuses of each solution, this eBook will weigh in on which approach to proctoring is better, and which strategy ensures educational institutions can provide an education of value and do what they do best. Educate.

The Need for Proctoring - Background

Demand for online education continues to grow. A recent analysis conducted by Eduventures indicates that the number of higher education students taking at least one online course is expected to grow to 8.5 million by 2020.

Forecast*	**2020**
Total Students Online – One Course or More	**8.5 Million Students**
Students Studying Mostly Online – 80% or At Least 3 Courses Online	5 Million Students
Students Taking 2 or Less Online Courses, or Less than 80% Online	3.5 Million Students

EDUVENTURES IPEDS BABSON Survey Research Group

Source: Eduventures Analysis, IPEDS and 2015 Survey of Online Learning by Babson Research

The Need for Proctoring

In this climate, educational institutions, many of which have a long brick-and-mortar tradition, still grapple with challenges to teaching online.

With online courses practically everywhere, they are trying to figure out how to safeguard the quality of their online degree programs, which requires they:

1. Authenticate the identities of online students,
2. Ensure students take exams without cheating, and
3. Assess student performance effectively.

Proctoring is critical to achieving these goals. There are three dominant methodologies for proctoring online exams that we introduced earlier: Live web proctoring, automated proctoring and on-demand web proctoring. These are also known as virtual proctoring solutions.

Each of these strategies has benefits and drawbacks; the one that proves to be the most scalable, convenient and cost-effective will likely become the most popular in the long run.

Why Proctoring is Important

An institution's online education strategy is only as good as the quality of the degree programs that drive it. With this in mind, proctoring is a valuable tactic to help educational organizations to protect the integrity of their online offerings, and to provide students with a degree they can be proud of--because they earned it.

Remote proctoring helps to authenticate the identities of online students, empowering an institution to make sure that enrolled students—not fraudulent individuals—are the ones sitting for exams.

Proctoring also helps students by deterring cheating. While it is difficult to measure how rampant this problem really is, one study published by Don McCabe of Rutgers University found that 56 percent of MBA students, 54 percent of graduate students in engineering, 48 percent of grad students in education, and 45 percent of grad students in law admitted to cheating" Academic Dishonesty in Graduate Business Programs: Prevalence, Causes, and Proposed Action," Donald McCabe, Kenneth Butterfield and Linda Trevino, 2006.

What's more, a recent study by Jeffrey A. Roberts and David M. Wasieleski at Duquesne University found that the more online tools college students were allowed to use to complete an assignment, the more likely they were to copy the work of others.

Even the most esteemed universities are not immune to this problem; in August 2012 nearly half of a Harvard University class of 279 students was accused of cheating on a take-home exam.

- "Academic Dishonesty in Graduate Business Programs: Prevalence, Causes, and Proposed Action," Donald McCabe, Kenneth Butterfield and Linda Trevino, 2006

- Studies Find More Students Cheating, With High Achievers No Exception," The New York Times. Sept. 7, 2012. http://www.nytimes.com/2012/09/08/education/studies-show-more-students-cheat-even-high-achievers.html

Why Proctoring is Important

Finally, by authenticating student identities and deterring cheaters, remote proctoring helps institutions utilize online exams to assess student learning effectively and securely. This allows institutions to protect the integrity of their brand, preserving an educational organization's reputation within its respective community.

It also supports schools in their efforts to safeguard student investments; because many students have to pay to take online classes and pay again (up to $60 per test) to take proctored exams, they deserve degrees they can trust.

Of course proctoring does not eliminate these issues completely for online education programs; these challenges are so rampant that no one solution is a panacea. Yet the price of doing nothing is the loss of integrity, the founding principle of academics.

"What proctoring can do is offer a viable solution for protecting a critical aspect of online education—the educational process itself."

- Douglas M. Winneg
CEO, Software Secure

A Look at Proctoring Models: **Live**

Currently, in the worlds of higher education and K-12 online education programs, there are three approaches to remote proctoring with technology: Live, Automated and On-demand.

Live Proctoring (Synchronous)

Live proctoring applies an old-school approach to the new challenges of online education. While the class transpires online in virtual space, exams are held at a specific time with humans monitoring students live via webcam. Generally speaking, there is one proctor for every 4-10 students; each proctor monitors an array of computer screens simultaneously.

The benefits of live proctoring model:

- **Accessibility (by Appointment):** Live proctoring provides security and convenience to institutions by enabling them to proctor students' online exam from anywhere with a high-speed Internet connection and webcam.
- **Immediate Correction:** By attempting to replicate the in-person proctoring experience online the belief is that live proctoring can correct suspicious behaviors as they happen.

A Look at Proctoring Today: **Live**

As we see it, the **disadvantages** for the **live proctoring model** are:

1. **Requires Scheduling:** In order to take the exams, students need to schedule the exam for a specific time. Many students choose online courses because they can fit into their daily schedules. Scheduling exams limits the convenience of online learning.

2. **Costly:** Exams are more expensive — up to 20-40 percent more - to cover the overhead of paying for a human to proctor.

3. **Inexperience:** There are no formal requirements and/or prerequisites for proctors who participate in most live proctoring sessions. Live proctoring is reliant on the quality of individual proctors, which in many cases are hourly-waged college students.

4. **Risk**: Giving an unknown proctor control over test-takers' computers is discomforting and may increase security risks for student's or organization's data.

A Look at Proctoring Today: **Live**

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Accountability: Students are held accountable for alleged cheating only with the testimony of the proctor, creating a "he said, she said" situation. Because there is no record of the exam session, instructors, who bear the burden to provide supporting evidence for academic integrity violations, are removed from the judgment process.

"Judge and jury": The burden on determining what is cheating, and what to do about it is borne by the proctor, who is doing the same for multiple exams, from multiple schools, all with different exam polices; at one time, and has no particular tie to the institution—a lot to ask of one person.

Net-net: The live proctoring model is less convenient, as it requires scheduling, is more expensive and relies on the fallacy of human observation.

A Look at Proctoring Models: **Automated**

The fully automated models monitor students using technology alone to determine whether or not a student has cheated, here's how they work:

Automated Proctoring (Asynchronous)

Automated proctoring uses technology alone, replacing the human with algorithms, to determine if a student is cheating. The computer monitors the student and determines whether they are cheating.

The automated solution providers have introduced systems that leverage various technologies to try to achieve the same results as the live and record and review solutions, but at considerably lower costs, as they have eliminated the human operating costs.

The benefits of automated proctoring:

- These solutions are generally perceived as more convenient, as there is no need to schedule a proctor, and
- Very scalable as the human component is replaced by algorithms.

A Look at Proctoring Models: **Automated**

The automated solutions are also capable of identifying behaviors suggestive of cheating, typically reporting these to course instructors along with the relevant evidence from video recording or screen captures made during the test.

The primary differentiator between automated proctoring and other proctoring models is that automated uses computer algorithms alone with no humans to make the call on whether or not a student is cheating. Whereas **record and review models** rely upon technology and human services.

Pitfalls of Automated Proctoring

There are certainly some benefits for automated proctoring, such as lower costs and greater efficiency. But there are numerous risks that come with algorithmic-driven solutions.

Identified here are five areas where automated proctoring solutions have challenges:

1. **Technology Inadequacies**

a. **False positives:** Automated systems have exceptionally high 'false flag' rates. For example, if you raised your arms up to stretch, this could throw up a 'flag'. To reduce these flags, the automated proctoring vendors have created filters in order to lower the number of flags, essentially making security settings more 'lenient'. And while you can adjust security settings, you can't 'turn down' cheating.

b. **Inaccurate:** Not all cheating is obvious, and this type of solution isn't intelligent enough to detect the more subtle forms of cheating.

c. **Limited assessment format**: This model cannot accommodate an open-book test as system is unable to flag use of 'cheat notes'.

A Look at Proctoring Models: **Automated**

2. Security

a. No real security: Automated proctoring solutions do not block programs, external monitors, shortcut keys, etc. With some solutions, the system will visibly provide student with exam entry password – which could put the assessment at risk if a student then shares the password.

3. Faculty & Admin Burden

a. **Increased work for faculty**: As automated systems have no human component, the burden of video review is left to faculty and administrators. This could potentially result in countless hours of work to an already overburdened staff.

b. **Educator-Student Conflict** – Faculty are burdened with reviewing the student's exam video, thus placing them in a position of being 'judge and jury' and potentially damaging their relationship with students. Why should they be asked to do it?

4. Limited Experience

a. Unproven model: Still new in the marketplace. Small number of clients and lack of experience supporting large clients.

5. Illusion of Lower Costs

a. **High margins:** In some cases, the vendor is charging the same price for their service as those providing a human component. What are you really paying for?

Hidden Costs of Automated Proctoring

Dollar for dollar, fully automated proctoring solutions are more expensive than other online proctoring solutions because they're only doing a very small percentage of the proctoring process as a whole. The actual exam video reviewing (the heavy lifting) is absorbed by the institution's educators who will need to spend time reviewing the exams and auditing the flags to determine if cheating occurred – or if it was a false positive.

A Look at Proctoring Models: **Automated**

Netting it out:

Automated proctoring solutions don't really detect cheating as it's not really proctoring students. In the end, the educators are the ones who will end up proctoring the exam as they will need to go through all the exams that have been electronically flagged.

As a provider, we've been there and have first-hand knowledge as our first generation product relied on technology alone . In one customer example– out of 100,000+ exams reviewed, 2,425 were flagged, 613 had true violations, with 75 percent of exams being false positives.

Scalability vs. Stretch – Does automated proctoring truly scale, or does it just stretch? Is it really scalable if teachers are inundated with videos to review?

Bottom line: Do you want a solution that tells you when a student is cheating, or a solution that merely provides you with a platform to do your own proctoring? If time equals money, how much are you really saving if you have to review exams yourself?

A Look at Proctoring Models: **On-Demand**

With the on-demand proctoring approach, exam sessions are monitored and recorded by computer and then certified proctors review the video afterward. Here's how they work:

On-Demand Proctoring (Asynchronous)

On-demand proctoring embraces and leverages technology, only involving humans where they can be the most effective. Under this approach, students agree to allow cameras to "watch" them while they take exams; if the cameras pick up anything out of the ordinary, the anomalous behavior is flagged in the recording by multiple reviewers after the exam.

A key benefits of on-demand proctoring is the ability to conduct post-analysis and intervention. Specialized video review tools allow certified proctoring staff to review videos at 20 times the native video speed, allowing for greater scale of review of examinations and efficacy.

These reviews occur off-site and are performed independently; if the review process determines a student has cheated, the reviewers refer the case to the educational institution for follow-up.

A Look at Proctoring Models: **On-Demand**

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Convenience and Comfort: Because students can take exams anytime, on-demand proctoring is convenient as it requires no scheduling. This method also provides the student with the option to take practice exams to help optimize test-taking performance.

Affordability: Utilization of technology means that cost is significantly lower (between 30-40 percent) than human-based approaches, allowing for schools to lessen the financial burden on students.

Scalability: Because on demand proctoring with a record and review model has been built on a cloud-based architecture, there are no limits as to the number of potential simultaneous exams being taken.

Accountability: "Record and review" system records the entire exam session, serving as a historical record or evidence. The resultant video is then provided to multiple reviewers to verify the integrity of each exam and then made available to the institution as requested.

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A Look at Proctoring Models: **On-Demand**

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Flexibility: This model's security enables more flexibility for faculty in terms of assessment design, as the computer only enforces the policy, and the proctoring team uses your policy as their guideline for reviewing exams.

Drawbacks for the on-demand proctoring model relate to follow-up:

Timing: Critics allege that this approach doesn't prevent cheating before it occurs but instead responds to cheating afterward.

Institutional Responsibility: In cases where video review leads the vendor to suspect a student of cheating, the onus is on the educational institution to review the 'marked' integrity events (suspicious activities) in the film and carry out discipline as necessary.

Based on our experience and data with exam review, we found that only a small percentage of students cheated. So why require 97 percent of students to use a less convenient, more expensive, more intrusive model that is less likely to catch the 3 percent of students that might cheat?

Net-net: On-demand is an ideal option for institutions that value the convenience of allowing students to take exams at anytime –anywhere while still having a real person review the recorded video.

Needs for the Future

Looking forward, as more and more colleges turn to online education, and those online offerings increase in size, the need for proctoring will continue to intensify.

And though there are pros and cons to any of the proctoring strategies. The best solution will be the one that simultaneously protects integrity while satisfying the needs of the institution and the online student. That is, one which is scalable, cost-effective and—given the hectic lives of today's online students--convenient.

For these reasons, on-demand proctoring has a distinct edge.

First, because the on-demand "record and review" proctoring solution is technology-driven, there's no limit to the number of exams an institution can manage at a given time.

Second, since on-demand proctoring enables exams to be monitored without humans keeping watch, students can take tests from anywhere at any time.

And finally, as affordability is one of the most attractive aspects of online education, the on-demand proctoring model becomes the best/obvious choice as it's the lowest-cost option. What's more, as prospective students choose an online course or program for the flexibility of studying when and where they desire – adding rigid requirements like exam scheduling disrupts the anytime learning model.

In summary:

Live proctoring is less convenient and more expensive,

Automated proctoring is more error prone and less secure, while

On-demand proctoring is more convenient and less expensive – and works better.

"Digital assessment is ultimately about being able to do any assessment digitally, to remove the need for physically tethered as well as human-proctored tests and improve modes of testing, grading and data analysis."

- Jan-Martin Lowendahl
Principal Analyst, Gartner

Key Differentiators

If institutions are going to create integrous online programs, they must be enabled to consistently hold students accountable for academic dishonesty. Instructors bear the burden of proof in academic dishonesty cases; the consistency of follow through is directly dependent upon the availability of evidence.

And this is where there are big differentiator between the three solution models: the burden of proof (exam reviews) and what institutions must do once they have it.

Automated: Faculty has to review the exams to proctor the results and audit them for accuracy.

Live Proctoring: empowers proctors to be judge and jury in the moment. This is assuming that live proctors even are capable of detecting all infractions; since proctors are watching multiple exams at a time, they may not see (or may not act on) suspicious activity when it occurs.

On-Demand: Results go direct to institution, and bypass faculty to remove them from being the 'bad cop'

Analogous to a traffic light, on-demand proctoring provides a record of the exam, leaving the final judgment of student behavior in the hands of those experienced professionals who are authorized to make the call.

It also leaves a longer lasting effect on student in terms of behavior modification. Just like the traffic light analogy, if you know you're being recorded, it's up to you to do the right thing!

The gulf between the three approaches raises the question: In whose hands do you want to place the reputation, rigor, and value of your online program?

Bottom Line

So what is the relative value of potentially stopping someone from cheating versus deploying a solution that is more convenient and cost effective for those that won't cheat, and is even more likely to catch those that do?

Sure, live proctoring might stop some students in the act of cheating. And automated proctoring seems a lot less expensive. But on-demand proctoring enables institutions to hold those who cheat accountable . The main difference is that on-demand model provides a record of the behavior that is carefully reviewed by multiple sets of eyes, including those of the instructor.

On-demand, automated and live proctoring all strive to protect the integrity of online learning.

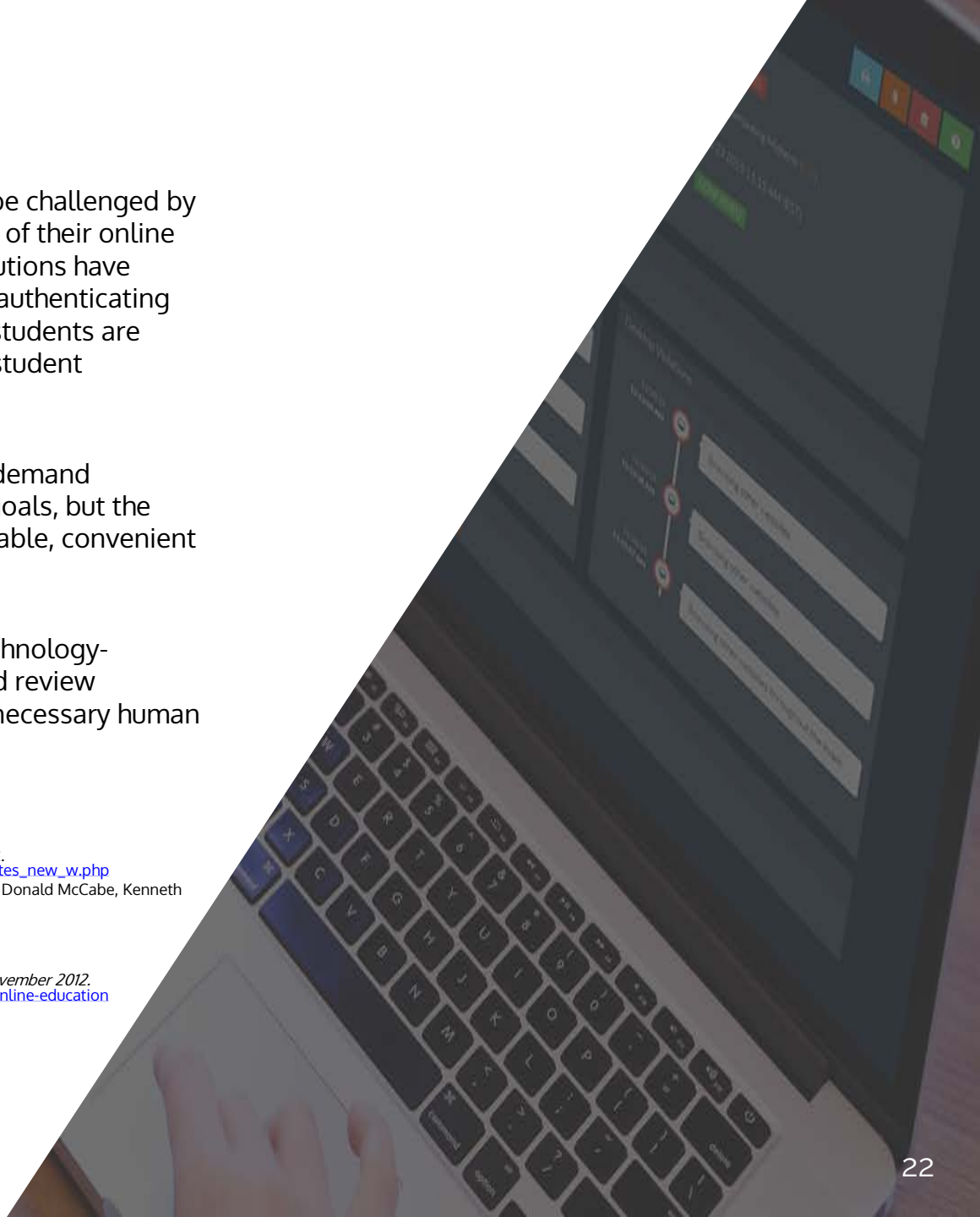
Automated proctoring relies on algorithms which generates high false positives and ultimately creates more work for educator. Live proctoring system necessarily relies on the fallacy of human observation "in the moment", the outcome of which is a less convenient, more expensive, and less reliable process than an on demand solution.

Conclusion

Educational organizations are will continue to be challenged by how to effectively verify the validity and quality of their online programs. It is clear that trusted proctoring solutions have become essential tools in online education for authenticating the identities of online students, assuring that students are taking exams without cheating, and assessing student performance effectively.

Live proctoring, automated proctoring and on-demand proctoring are worthy tactics to achieve these goals, but the latter model's approach is ultimately more scalable, convenient and cost-effective across the board.

The authors of this report believe that in the technology-focused world of online education, a record and review approach that uses technology to improve the necessary human aspects of proctoring will reign supreme.



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"To ensure the integrity of academic credit, in addition to verifying the identity of the student, we now need to verify the integrity of the test itself.

Software Secure's RPNow system does both and is the ideal solution for the edX platform."

- Anant Agarwal, CEO, edX

About Software Secure:

- 1999: Founded by Douglas M. Winneg
- HQ in Newton, MA
- Recognized market leader
- 400+ college, university, K-12 and certification customers
- Millions of exams taken

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