Online Proctoring

Online proctoring solutions are a category of tools that attempt to replace in-person invigilators with methods to deter academic misconduct while students are completing assessments online. The methods used by these tools can be active, such as recording and monitoring students during assessment, or passive, such as the monitoring of open applications at the time of an assessment. The solutions with the more active tools most closely mimic in-person invigilation but come at a higher cost.

There are four types of solutions to online proctoring (fully detailed below in the Assessment Solution section, p. 4), often implemented in combination:

1. Passive monitoring of activity on students' computers.
2. Active restriction of software on students' computers.
3. Passive video surveillance of students.
4. Active video surveillance of students.

Examples of academic misconduct pre-date the internet, and none of the technical solutions detailed below can guarantee that through their use, students cannot, or will not deviate from academic honesty.

For the Spring Semester, CITL believes that the most equitable, accessible and least risky solution to invigilated online assessments would be to have instructors modify course designs to incorporate non-invigilated assessment strategies. This is primarily due to the complexity of relying on an online-only solution.

CITL remains ready to work with instructors to consult on alternative assessment strategies.

Memorial's current approach

To offer online invigilation, Memorial's Centre for Innovation in Teaching and Learning (CITL) has selected a combination of services that fall into category 2 (Respondus) and 4 (ProctorU) for the online invigilation of some assessments in DE courses.

Exams are entered into in Brightspace, Memorial's Learning Management System (LMS), and are completed by students via the quiz tool in the LMS. Students writing an online-invigilated assessment are scheduled to write within a window of time (e.g. all students write on the same day, but some students begin their assessment at 9:00am, and some begin their assessment at 1:00pm).

It is important to note that to-date only a small subset of students in DE courses make use of these tools. This is due to a variety of issues: not all assessments are suitable for online invigilation; students eligible for online proctoring have the flexibility to choose to complete the assessment in-person; and CITL requires students who are less than 80km away from St. John's and Corner Brook to write in-person.

With the current approach, CITL staff play an important logistical role in the scheduling and coordination of these assessments. This includes setting up the proctoring with the vendor, communicating with the instructor, and mounting the assessment in the LMS. CITL's approach was designed to ensure that the highest level of academic integrity could be upheld while maintaining a consistent experience for instructors and students.

Issues and integrity

For DE courses, online invigilation of assessments is offered as an alternative to writing in-person, not as the default option. Memorial's services have technical requirements that include a computer with a webcam and an adequate high-speed internet connection. Students have to meet those technical requirements

before they can complete assessments through online invigilation. If students cannot meet the technical requirements, students write the invigilated assessment in-person.

Online proctoring solutions that offer higher confidence in the integrity of the assessment have these more sophisticated technical requirements. Our current solutions' technical requirements will mean a greater number of students will be unable to access the tools and complete the assessments as planned. Additionally, any strategy to conduct invigilated exams that rely primarily on internet-based solution are subject to disruption due to transient internet connectivity issues. No online-based solution will be as accessible or reliable as in-person invigilation, or a model that has a blend of both modalities.

When compared to courses without invigilation, or where in-person invigilated assessments are available, there is increased risk, due to the factors noted above, to only conduct assessment though these online means.

Strengths and limitations of expanding Memorial's current solution

Strengths of Memorial's current solution:

- Tools have gone through ITS' cloud and privacy assessments.
- Tools are integrated into the LMS.
- Tools can be used immediately.
- Consistent experience for instructors and students.
- Of the four categories of assessment solutions listed below, MUN's combination of tools offer the highest level of confidence in the integrity of a student's assessment.

Risks of Memorial's current solution, within the context the Spring semester:

- Highest cost.
- There will be students who do not have the appropriate technology or internet connectivity to successfully use the online invigilation tools.
- An increase in online-invigilated exams will increase CITL staff workload. CITL cannot accurately model when demand will outstrip our capacity, but a wider adoption of the current suite of tools has workload implications for the unit.
- The capacity of ProctorU to invigilate a higher number of exams is unknown.
- Exams which require mathematical notation, any kind of illustration or hand-written answers cannot be offered through the LMS, effectively excluding them from online invigilated exams.

To work reliably and equitably, a solution would require all students to all have:

- The proper computer equipment;
- An internet upload speed that is fast enough to support streaming video while taking the assessment;
- An internet connection that is reliable throughout the assessment; and
- Integrity not to share questions or answers with students starting the assessment after they finish their own.

A solution would require all instructors to have:

- Exams that do not require any hand-written solutions;
- Exam designs that reduce the likelihood of students deviating from academic honesty (e.g. bank of test questions larger than the length of exam; randomization of questions; randomization of multiple-choice distractors); and
- Submitted exams to CITL at least three weeks before the exam delivery date.

A solution would require the institution to have:

- The funds to pay for the services ($25 USD per assessment, per student for active surveillance or up to $60,000 USD for an annual site license for passive surveillance);
- Capacity, including: the privacy assessment and integration of any new tool; the logistics of coordinating scheduling and assessment entry.

Assessment solutions

1. Passive monitoring of activity

This type of software is designed to document which application(s) a student is running on their computer, and to notify and document if they switch to another application while taking an exam. It may also use software techniques to monitor activity patterns on the computer, including keyboard and mouse inputs. Solutions using this method often require no special software to be installed on the student's computer and can work in any web browser.

Pros:

- Minimally invasive
- Compatible with most computers and operating systems

Cons:

- Does not monitor activity on other devices: a student can use a second computer/tablet to access content without knowledge of this software.
- Does not monitor the student or their surroundings: they will be able to have a "helper" to coach them on their online exam responses.
- Cannot purchase a solution "à la carte": sold as part of a larger suite of services.

Example of this type of software:

- D2L Integrity Advocate
- Top Hat Test

2. Active restriction of software

Online assessments can be conducted within a specially designed "lockdown browser" application that is installed on the student's computer. This software is able to block access to other software applications on that computer. Memorial's current solution is Respondus LockDown Browser.

Pros:

- Cost: Memorial currently has an institution-wide license to Respondus LockDown Browser
- Prevents student from accessing other software or content on their computer.

Cons:

- This software is not 100% reliable and it can inadvertently block software such as assistive technologies.
- Does not monitor activity on other devices: a student can use a second computer/tablet to access content without knowledge of this software.
- Does not monitor the student or their surroundings: they will be able to have a "helper" to coach them on their online exam responses.

3. Passive video surveillance

This software accesses a student's webcam to directly monitor a student and their surroundings during an exam. Video can be monitored automatically by software to identify patterns that may indicate cheating,

and the video can be viewed by an instructor during the exam or reviewed after the exam. This can build upon active software restrictions, to detect visible student behaviours that may indicate cheating. As with any AI application, the detection of visible student behaviours that indicate cheating are based on a data set. This means that the “normal” behaviours likely prioritize those exhibited by cisgender, white, able-bodied, neurotypical students.

Pros:

- Passive surveillance makes it more difficult to use second devices or receive assistance.
- Video of assessments can be reviewed.
- Could be integrated into LMS with assessments scheduled by instructors, thereby distributing logistical load.
- ProctorU review+ could be quickly adopted as ProctorU is a CITL service provider and ProctorU live+ has undergone institutional privacy and cloud assessment.

Cons:

- Cost: a 20,000 FTE campus license for ProctorU review+ $60,000 USD/year or more; Respondus Monitor approximately $38,000 USD/year for 18,000 FTE.
- Timeliness: Any new service would need to undergo ITS’ institutional privacy and cloud assessment, lengthening the time to launch.
- Access to technology: students would need to provide a compatible computer and webcam.
- Privacy: video of students may also include family members in the background.
- Bandwidth: streaming video from a student’s computer to a server will require reliable broadband internet at each student’s location for the duration of the assessment.
- Equity: AI data set likely not as inclusive as Memorial’s student body, thereby generating false positives.
- Reliability: an enterprising student could creatively apply technology that may be overlooked by their webcam, or they may use specialized technology to generate or alter the video stream used by their computer to mask visible cheating.

Examples of this type of software:

- Proctorio (used by UBC and Royal Roads University)
- ProctorU record+ and review+ (used by Athabasca University)
- Respondus Monitor
- ProctorTrack ProctorAuto and QA
- IntegrityAdvocate
- Examity
- HonorLock

4. Active video surveillance

This particular category of tools is typically based on surveillance technology that is deployed into students’ own computers and homes. They typically employ webcams to record video of students and their surroundings during assessments, and also install software on students’ computers to enforce controls over other software that students have access to. This is similar to the passive video surveillance software but adds human invigilators to monitor the videos in real time. Memorial’s current solution, ProctorU, describes this tier of service as employing “professionally-trained live proctors monitoring every session and active intervention into cheating behaviors”.

Pros:

- Less reliant on AI that may miss deviations from academic honesty.

- Proctors monitor the video streams of a number of students who can troubleshoot potential deviations from academic honesty as they occur.

Cons:

- Cost: CITL is charged $25USD (per student, per assessment) for a two-hour exam; costs increase and decreases with length.
- Access to technology: students would need to provide a compatible computer and webcam.
- Privacy: video of students may also include family members in the background.
- Equity: there are documented examples of proctors asking racialized students to “shine more light” to be seen properly while taking invigilated assessments.
- Bandwidth: streaming video from a student’s computer to a server will require reliable broadband internet at each student’s location for the duration of the assessment.
- Reliability: while the risk is low, an enterprising student could creatively apply technology that may be overlooked by their webcam, or they may use specialized technology to generate or alter the video stream used by their computer to mask visible deviations from academic honesty.
- Integrity: ProctorU schedules exams for the same date, but not all students’ exams are scheduled to begin at the same time. That means that a student could start their exam at 9AM, and another student in the same course would start their exam at 1PM.

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