



# Technology Evaluation Report: Proctorio

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**Note:** This report summarizes outcomes of a specific UBC pilot. Findings do not reflect broader or official UBC opinions about the learning technology evaluated.

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## Executive Summary

This evaluation sought feedback from UBC instructors and students piloting Proctorio, an online service that offers automated remote proctoring.

To use Proctorio, instructors and students install the Chrome browser with Proctorio's Chrome extension. Once this extension is installed, setting up and completing assessments is all done within Canvas. For each assessment, instructors decide if they'd like Proctorio to record video, audio, and/or screen activity for each student and set how closely they want Proctorio to monitor the recordings. Before each assessment, students undergo an identity verification process. Once an assessment completes, instructors access a Proctorio dashboard in Canvas to see outcomes, which include automated flagging that Proctorio adds for each student based on the settings selected.

Four instructors and 88 students provided feedback on Proctorio during the consultation period that ran during 2018 S2 term. The four courses in the pilot were from the Faculties of Science, Arts, and Land and Food Systems. One was a first-year course, one was a second-year course, and two were third-year courses. All were part of distance education, with class sizes ranging from 60-150 students. Two courses hosted quizzes only in Proctorio, while two courses conducted midterm and/or final exams.

Overall, instructors were largely satisfied with using Proctorio as a replacement for in-person, invigilated assessments. Proctorio gave instructors confidence in fairness by requiring students to complete the identity verification to start, preventing certain behaviours during the assessment, and allowing full manual review of each student's recording after the assessment completed.

All instructors also noted ways remote proctoring seemed to improve the student and instructor experience. In removing the need to heavily weight in-person invigilated assessments, instructors could more equally distribute grade weight and therefore lessen student anxiety around any specific assessment. Students could take assessments in their own space and in a digital format, providing more ease around the process. Going digital also meant instructors could save time in transporting and grading paper-based

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assessments, so students could get grades faster. And a few instructors thought additional insights about what questions to ask on assessments came from setting up and monitoring the student recordings.

The biggest downside for instructors was the ineffectiveness of Proctorio's automated flagging, which seemed tricky to customize to identify genuinely suspicious behaviour. Instructors also seemed unclear on how using Proctorio affected what they could or couldn't do in Canvas. Many instructors also saw ways in which Proctorio negatively influenced the student experience and by extension their own. Students reported issues meeting technical requirements and troubleshooting bugs, as well as concerns about privacy, and some instructors felt significant time went into responding to these.

Student response to Proctorio varied significantly by course, with students reacting less positively in Course 1 and 2 and more positively in Course 3. Benefits that some students discussed in the survey comments included the ease of use in installing, setting up, and/or running Proctorio, its contribution to making the course seem more fair, and the flexibility in choosing a location to take assessments in.

However, negative sentiments outweighed the positive in the comments, with many students expressing frustration with meeting technical requirements, dealing with slow performance when Proctorio was running, and troubleshooting issues when accessing assessments and passing the identity verification step. An equal number of students discussed concerns around privacy and felt knowing the tool was running in the background was distracting and disconcerting during assessments. Additionally, some students brought up anxieties related to not clearly understanding what would trigger Proctorio to close their assessment or flag suspicious behaviour, as well as challenges in finding quiet, private, and connected settings to take assessments in, even when at home (since roommates, family members, and/or outside activities could still interfere).

Based on the outcomes, recommendations for how Proctorio could best be implemented at UBC include:

1. Using remote proctoring more consistently in all distance education courses or across courses fulfilling similar requirements

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2. Giving on-campus students options for borrowing equipment and reserving space to take Proctorio assessments
  3. Providing more training for instructors and/or support staff on how to best set up and efficiently monitor Proctorio automated flagging
  4. Including test runs in Proctorio for both instructors and students before assigning higher-stakes assessments
  5. Explaining to students explicitly how the restrictions and flagging will work in Proctorio and that outcomes are ultimately reviewed by a human
  6. Creating a common privacy reassurance resource for students to increase transparency around who can/will view recordings and to invite follow-up questions
  7. Preparing a Plan B for students who can't access (or opt out of) remote proctoring that is also invigilated

Implementing Proctorio with these recommendations may help resolve some of the concerns brought forward by instructors and students and improve future users' perceptions of the tool's pedagogical value.

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## Goal

This evaluation sought feedback from UBC instructors and students piloting Proctorio, an online service that offers automated remote proctoring. Automated remote proctoring lets students take assessments anywhere at anytime, rather than having to arrange a place and time to show up for in-person invigilated test sessions.

At UBC, Proctorio is enabled on a course-by-course basis in the primary Learning Management System, Canvas. Once enabled, instructors must install the Chrome browser with Proctorio's Chrome extension<sup>1</sup>, which allows the tool to operate. Then they can turn Proctorio on or off for any Canvas assessment they create.

For each assessment, instructors decide if they'd like Proctorio to record video, audio, and/or screen activity for each student<sup>2</sup>. They can also set how closely they want Proctorio to monitor various student behaviours (e.g., head and eye movement) and environmental factors (e.g., audio fluctuations) and if any student actions should be restricted (e.g., visiting other websites).

When instructors assign a Proctorio assessment, students must also install the Chrome browser with Proctorio's Chrome extension. Once installed, Proctorio can record the students' video, audio, and/or screen activity during the assessment. Before each assessment, students undergo an identity verification process, demonstrating that their features and/or signature match an official photo identification.

Once an assessment completes, instructors access the Proctorio dashboard—available at UBC through Canvas—to see outcomes. Proctorio automatically analyzes all recorded media and flags potential issues for instructors to review based on the settings selected (some of which may be fine-tuned post-assessment). Instructors can also review each student's assessment recording in its entirety, including the identity verification step.

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<sup>1</sup> This is the only extension currently available, so anyone using Proctorio needs to use Chrome as their browser for Proctorio-related activities.

<sup>2</sup> The first two options require each student have access to a built-in or externally-attached webcam and/or microphone when they complete the assessment.

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This report will detail the methodology used in evaluating Proctorio, why instructors chose to use it, the potential pedagogical value identified by people in the pilot, and how the tool could best be implemented at UBC.

## Methodology

The Proctorio pilot ran during 2018 S2 term in four courses new to both Proctorio and automated remote proctoring generally. Four instructors were interviewed at or near the end of the term about their experience. Each interview consisted of 11 questions (see [Appendix A.1](#)), directly or indirectly addressed during in-person or teleconference meetings.

Students in three<sup>3</sup> of the courses were asked to respond to an online survey near the end of term; 88 responded prior to September 2018. At the time of the survey, all students had used Proctorio at least once for an assessment (quiz, midterm, and/or final exam). The student survey included 7 questions (see [Appendix A.2](#)).

The types of courses in the pilot came from the Faculties of Science, Arts, and Land and Food Systems. One was a first-year course, one was a second-year course, and two were third-year courses. All were part of distance education, with class sizes ranging from 60-150 students. Summarized use cases for each course are provided below. The primary difference in application use was when and how Proctorio was applied during the term.

Faculty / Year	Students & Responses	Proctorio Use(s)
<b>Course 1</b> Science / 1st Year	~150 students 12 responded	<ul style="list-style-type: none"><li>• 3 quizzes</li><li>• No exams</li></ul>
<b>Course 2</b> Science / 3rd Year	~130 students 62 responded	<ul style="list-style-type: none"><li>• 4 quizzes</li><li>• No exams</li></ul>
<b>Course 3</b> Land & Food Systems / 2nd Year	~60 students 14 responded	<ul style="list-style-type: none"><li>• Midterm exam</li><li>• Final exam</li></ul>

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<sup>3</sup> One instructor forgot to send the survey link in time.

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<b>Course 4</b> Arts / 3rd Year	~60 students (not surveyed)	• Final exam
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## Findings

### Instructor motivations

In piloting a remote proctoring tool, instructors described three primary motivations.

#### Preventing cheating in distance education

For many distance education instructors, *"one of my big concerns is that you don't really know who's taking [assessments] along the way"*. In the past, *"we've had experience with groups of students who actually paid someone else to write their [assessments] for them"*. Proctorio seemed to offer a simple but reliable means of verifying identity for online assessments.

In addition, a couple of instructors wanted a better means of restricting collaborations between students to *"make sure they weren't talking to anybody else in the room"* or otherwise working with a partner or group in taking an assessment. *"Those boxes were ticked by the way Proctorio allows us to choose all these various settings"* of what to monitor in the recordings.

#### Improving the student experience in distance education

Without remote proctoring, distance education instructors often require students to attend one or more official invigilated test sessions. This places several additional stressors on students around an already stressful event.

1. Students need to schedule and accommodate showing up to a time at a testing site, which for some rural students may mean *"they had to drive three hours"* to reach the site, then take the assessment, and drive all the way back home.
2. Because in-person assessment is the only way to know the student is the one writing the test, *"it was very heavily weighted"* compared to the rest of the course. The

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pressure to do well on these assessments has *“caused a few problems over the years because students get so worried about passing”*.

3. Those students taking mostly or exclusively distance education courses spend the whole term *“interacting online in a very different way all semester compared to the final”*, with *“no way to properly prepare them for...the conditions of the final exam”* (i.e., working in a room with others and an invigilator) until it happens.

Proctorio was seen as a way to resolve all of these issues, by 1) letting students take assessments online wherever was convenient for them, 2) allowing instructors to better distribute grade weight throughout the course, and 3) providing a more consistent experience for distance education courses. In short, for some instructors *“trying Proctorio was [trying] to minimize student anxiety and stress”* as much as trying to prevent cheating.

### **Increasing efficiency by replacing paper-based assessments**

Finally, some instructors noted distance education assessments can entail especially high costs and delays with transporting paper-based assessments to and from remote locations. Often, *“this takes a very long time to get the exams”* back, depending on where students live, and *“it just seems very wasteful, all the energy used to transport paper”* around. Proctorio offered a way *“to expedite getting exams to me once they were written off campus”* and eliminate some of that extra cost and waste.

### **Instructor response to using Proctorio**

On a scale from 1 (strongly disagree) to 5 (strongly agree), all pilot instructors gave Proctorio a '4' for meeting their requirements and a '4' or '5' for being easy to use.

### **Perception that cheating was more tightly controlled**

Most instructors felt Proctorio's process and restrictions did help prevent cheating or at least *“it reduces for me the suspicion level”* that cheating was occurring. Instructors reached this level of assurance thanks to three aspects of Proctorio assessments.



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First, Proctorio successfully required students to complete the identity verification step, as explained earlier. Second, Proctorio worked well in preventing specified behaviours (e.g., copying questions, printing assessments)—*“it meant that I don’t need to worry about the...questions getting out as much”*, which *“tightens the control around how fair the course is ultimately”*. Third and perhaps most importantly, instructors could review each student’s video directly in Proctorio to ensure *“there weren’t any issues that I needed to take up with any students”* (whether automatically flagged or not)<sup>4</sup>.

### **Improvements noted to student experience (less test anxiety, more flexibility)**

All instructors also noted ways remote proctoring appeared to improve the student experience. For those instructors with heavily-weighted assessments, a couple confirmed Proctorio *“allows me to be much more flexible in the assessment style”* and grade distribution, so *“the students are not as anxious about doing well”* on any one assessment. A couple of instructors also noted the convenience for students in getting to choose *“a more enjoyable space to sit and think and ponder and write out the answers”* than a testing site, as well as how *“you do it on your computer instead of having to write everything”* by hand, which can be a literal pain since *“students are not used to writing for 3 hours at a time”*.

### **Quicker grading turnaround time**

Some instructors additionally highlighted the anticipated improved efficiency that came from moving paper-based grading online. *“It was great that once it was written...I could start marking it and looking at it right away”*, a benefit which is *“convenient for students \*and\* faculty”*. With the hassle of physically mailing and then picking up paper exams, often *“it takes weeks for students to get their final exam grades back”*; with Proctorio acting as an assessment delivery service, this delay was non-existent and the process overall *“better for the environment”*.

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<sup>4</sup> In fact, none of the instructors found any evidence of cheating in the pilot courses.

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## Insights from setting up and monitoring assessments

Finally on the benefit side, a couple of instructors highlighted unexpected insights that came from using Proctorio. In considering the settings, *"picking those priorities made me think about trying to ask better questions"* generally. That is, realizing the limitations of what Proctorio could police prompted re-examining (and changing) any question *"that's [too] easy to communicate a response to"*. Second, in later reviewing the flags and recordings Proctorio captured, *"it gave me some insight as to how people were writing the [assessment]"*. For example, on open-book assessments, how and how often students used and consulted notes and texts.

## Abundance of false alarms in automated flagging

In terms of drawbacks, the biggest by far for instructors was the ineffectiveness of Proctorio's automated flagging. Proctorio calculates a 'suspicion level' for each student that, according to the documentation, roughly reflects the percentage of the student's recording that contains suspicious or abnormal behaviour. But for most instructors *"the suspicion level indicator was not consistent with what I expected"*. This was because Proctorio frequently reported very high levels of suspicion (sometimes for the majority of the class) that upon deeper manual investigation revealed nothing truly suspicious. *"It actually gave me a fright the first time"*, but *"I never found any suspicious activity other than people would sometimes shift in their chairs or something like that"*, meaning the suspicion was too often triggered by *"fidgeting not cheating"* or equally innocent behaviour.

Some instructors realized they could make certain settings less sensitive post-assessment to bring down the number of these false alarms. However, it seemed difficult to fine-tune in a way that triggered flags for the desired behaviours while excluding others<sup>5</sup>. Instructor sentiment generally was that *"it would be great to have the flagging be more reflective of what I was looking for"* rather than *"flagging things based on conditions"*. In other words, instructors

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<sup>5</sup> For example, *"I couldn't get a setting that would flag for when students left the view of the camera"* in order to capture bathroom breaks. Proctorio has flagging options around head and eye movement that could work for this, *"but both exams were open book, so those were really minimized for flagging"*.

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would have preferred more customization options to make the suspicion level meaningful for their context, as well as smarter automated detection so *“if someone scratches their eye, it shouldn’t spike”*, no matter the settings used<sup>6</sup>. Otherwise, instructors end up manually reviewing numerous recordings, which may be acceptable for smaller class sizes, but *“it would be a bit more unwieldy with 200+ students”*.

### Parts of instructor experience unclear

A few other aspects of the instructor experience were also unclear at times. Many instructors thought Proctorio assessments in Canvas had different constraints than regular Canvas assessments (e.g., end dates could not be changed), though investigation by support staff did not find this to be the case<sup>7</sup>. One instructor also had to change the regular grading process used, since grading in Proctorio (i.e., Canvas) did not allow for the same kind of notation available on paper. *“It would be nice to have a highlighter or a pen type function where you could just kind of mark on the exam”* digitally.

### Stress dealing with students’ technical and privacy issues

While all instructors pointed out improvements in the student experience, they also noticed new stressors. Several students ran into bugs in setting up and/or accessing their Proctorio assessments; namely, Proctorio would ask for an access code that did not exist<sup>8</sup>. The burden of getting up and running for a few was reportedly significant, and *“if it takes 2 hours to answer 5 questions because your system is not working with Proctorio, that’s going to create a lot of anxiety”*. Some students also brought forward privacy concerns to instructors, since *“when you’re installing Proctorio on your computer and it’s telling you it can spy on whatever you’re doing, that’s scary stuff”*.

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<sup>6</sup> Proctorio could help by framing the automated findings in a less alarming (and less authoritative) manner in the user interface, so instructors are not given the impression a student has cheated but simply has a recording with X moments that may need review, based on the current settings.

<sup>7</sup> These were likely issues with early implementation that have since been resolved.

<sup>8</sup> The workaround for this was a process of uninstalling Proctorio, restarting the computer, clearing the browser cache, then re-installing Proctorio, although this did not resolve the issue for everyone.

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For some instructors, these student stressors “*did add administratively*” to their workload for the course, since “*trying to deal with all these issues*” could include 1) responding directly to student questions and concerns, 2) redirecting students to an appropriate support channel for follow-up, and/or 3) duplicating assessments so students could complete them outside of Proctorio, all of which take time. That said, most instructors seemed optimistic that the bugs would get ironed out and that with more experience, they would be able to better anticipate and possibly preempt common questions and concerns.

### **Possible higher drop rate with Proctorio use**

One instructor brought up a final downside that may or may not have been related to difficulties in using Proctorio: a roughly 20% higher drop rate than average for the course. “*Whether they dropped it because they couldn’t get Proctorio working or they weren’t the ones taking [assessments for the course] and now they discovered they had to be, I just don’t know*”.

### **Student response to using Proctorio**

Student response to Proctorio varied significantly by course<sup>9</sup>, with 50%, 34%, and 79% of students reporting positive experiences respectively in Course 1, 2, and 3 (see [Appendix B.3](#)). The pattern of Course 1 and 2 students responding less positively and Course 3 students more positively can be seen throughout the survey results (i.e., see [Appendix B.2](#), [B.4](#), [B.7](#)).

Interestingly, Course 1 and 2 ran only quizzes in Proctorio, while Course 3 conducted a midterm and final exam. It is possible student expectations of how much effort should be involved in taking an online quiz vs. an online exam played a role in these reactions, though the evaluation surfaced benefits and drawbacks independent of assessment type.

### **Ease of installation**

Survey comments revealed three main benefits students noticed in using Proctorio (see [Appendix B.5](#)). First, several students pointed to good ease-of-use in installing, setting up, and/or running Proctorio. These students appreciated aspects like “*how it automatically did*

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<sup>9</sup> As, it should be reiterated, did response rates.

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*the [technical] scans and checks for you*" during setup and *"how discreet it was during the exam"*. When Proctorio worked, it seemed to work well.

### **Positive sense of overall fairness**

Second, a handful of students believed or hoped that Proctorio was *"making the online quizzes and exams more legitimate and fair"*. In responding to a question on fairness specifically, the majority of students in each course (66%, 72%, and 72% respectively) agreed remote proctoring was the same as in-person invigilation, with the minority remainder split equally (or nearly) between thinking one or the other was better (see [Appendix B.4](#)). Agreement here is interesting, since other areas of comparison showed more of a split between Course 1 and 2 vs. Course 3.

### **Appreciation for flexible assessment location**

Finally, a few students mirrored what instructors brought up regarding assessment location: that it was helpful they could *"take it in the comfort of my own home"* or other place of their choosing. When asked where they took assessments, 93% of respondents reported completing one or more assessments at home, 11% at a library, and 3% choose other locations like a classroom or workspace (see [Appendix B.1](#)). After this experience, the majority of students in each course—67%, 90%, and 86% respectively—also indicated a preference for online vs. in-person assessments (see [Appendix B.7](#)); this may have been related to the increased flexibility.

Overall, however, survey comments focused more on the negative aspects students encountered, with roughly 85% of comments including negative sentiments vs. 34% that included positive. Four primary frustrations emerged, with privacy concerns and technical issues topping the list (more than a third of the comments focused on one or both of these, see [Appendix B.6](#)).

### **Feeling of privacy violation**

On the privacy front, students repeatedly described Proctorio as *"invasive"* or an *"invasion of privacy"*. For these students, knowing the tool was running in the background was

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distracting and disconcerting during the assessments. *"I just hate being watched essentially while doing a quiz in my own home",* and this sense of *"being watched very, very closely...it makes me uncomfortable sometimes."* One student felt *"you feel like you're being studied in a lab",* which for some *"added pressure"* in completing these assessments and made the experience *"more intense than in an exam room",* where even with invigilation the observing is more dispersed.

Interestingly, several students with these concerns acknowledged a purpose or usefulness to remote proctoring in their comments but still couldn't shake their personal discomfort with the approach. As one student put it: *"I understand...Proctorio is meant to be equivalent to hav[ing] a professor in the classroom keeping an eye on students who are taking an exam. However, something about having my computer camera and microphone monitoring me in my home felt creepy and intrusive."*

### **Difficulties dealing with technical issues (hardware and software)**

On the technical issues front, students described three types of challenges. One was securing access to the appropriate hardware, i.e., a computer with an operating system compatible with (a supported version of) Chrome and a webcam/microphone. Another challenge was dealing with system slowdowns reportedly caused by running Proctorio. And a final challenge was difficulties with Proctorio itself, including the issue already mentioned by instructors of Proctorio prompting for a non-existent access code, a problem with the Canvas-Proctorio integration in one course<sup>10</sup>, and troubles with the identity verification step. Regarding the latter, students found it difficult at times to properly register their ID cards with Proctorio—*"sometimes I would waste 10 minutes taking photos"*—as well as capture their faces, especially in low lighting or when wearing glasses.

### **Uncertainty around how automated flagging works**

Another area of anxiety for some students was trying to understand how exactly Proctorio worked. When instructors combined certain settings, unexpected actions could apparently kick students out of assessments. For example, *"I tried to ctrl+F ...to find a word on the page*

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<sup>10</sup> Hopefully a one-time occurrence, but neither vendor took responsibility for the issue.

but it automatically started count[ing] down, saying I had left the exam and had to click something to re-enter...that gave me a shock". Other students found themselves worried about flagging and consequences, "afraid that Proctorio will pick up on something I am doing and assume that I am cheating" or that a flag would be triggered by "some background noise wherever I took it that I couldn't control". This lack of trust in Proctorio notably resulted for a few in feeling "the need to rush through my quizzes in order to try and reduce the likelihood of it closing unexpectedly" or "prevented...from using [allowed] material in fear of being flagged".

## Challenges in finding good assessment location

A related and final downside for some students was around finding or creating an appropriate space for taking their assessments. Students at times struggled to find "a private area with a secure connection" that would meet Proctorio's technical requirements and avoid undue flagging, especially if they needed to use a computer that was not their own<sup>11</sup>. Additionally, since students could and often did take assessments at home, some experienced stress in trying to control the noise level of roommates or family. "I didn't enjoy...having to ask people I share my house with to remain quiet and halt whatever they were doing" (especially since "sometimes they did not comply").

## Recommendations

Based on this pilot's outcomes, these are some recommendations for how Proctorio could best be implemented at UBC to maximize its perceived benefits and minimize its perceived shortcomings.

1) Use remote proctoring consistently in distance education courses	
May address	<ul style="list-style-type: none"> <li>• <a href="#">Perception that cheating was more tightly controlled</a> (instructor benefit)</li> <li>• <a href="#">Possible higher drop rate with Proctorio use</a> (instructor issue)</li> <li>• <a href="#">Positive sense of overall fairness</a> (student benefit)</li> </ul>

<sup>11</sup> One instructor relayed the story of a student forced to use a public library near home in order to meet technical requirements. Due to the noise in the environment (including an altercation requiring staff intervention), the student wore headphones to concentrate, but this meant the instructor had to trust the student didn't also use the headphones to receive external assistance.

Some instructors thought that the currently inconsistent use of remote proctoring meant that students who considered or planned on cheating still had options. They could skip registering for (or drop out of) courses using Proctorio and simply sign up for another taking a different assessment approach. Therefore, applying remote proctoring (or another form of invigilation) across the board or at least across courses fulfilling similar requirements seemed like an important part of keeping things fair for everyone, not just those within an individual course.

2) Give on-campus students options for equipment and space	
May address	<ul style="list-style-type: none"> <li>• <a href="#">Abundance of false alarms in automated flagging</a> (instructor issue)</li> <li>• <a href="#">Appreciation for flexible assessment location</a> (student benefit)</li> <li>• <a href="#">Feeling of privacy violation</a> (student issue)</li> <li>• <a href="#">Difficulties dealing with technical issues</a> (student issue)</li> <li>• <a href="#">Challenges in finding good assessment location</a> (student issue)</li> </ul>

Many instructors brought up the idea that UBC could assist students with securing the right hardware and finding an appropriate setting to take assessments in by providing these options on campus. Instructors would like to tell students where they can borrow laptops or access desktop computers (e.g., a lab space) that are compatible with Proctorio (or ideally already set up with Proctorio). Instructors could also see usefulness in offering designated, quiet, connected spaces on campus for students to reserve for assessment taking. Both of these options might help students feel less privacy violation as well, since those with access to campus would not be forced to install Proctorio on their personal device and/or be monitored in a personal space. Perhaps funds related to improving the student experience could be tapped into for this.

3) Provide more training for instructors and/or support staff	
May address	<ul style="list-style-type: none"> <li>• <a href="#">Abundance of false alarms in automated flagging</a> (instructor issue)</li> <li>• <a href="#">Parts of instructor experience unclear</a> (instructor issue)</li> </ul>

Instructors had varying degrees of satisfaction in the training they received, but all agreed training was a key part to feeling comfortable using remote proctoring. As one instructor explained, *“it’s kind of daunting to use it the first time because there’s a very high effect on the*



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*student*", so instructors want to feel especially prepared. In particular, the pilot instructors could have used more guidance in what effect Proctorio would have on regular Canvas assessments (or reassured there was no effect) as well as how to best set up (e.g., which lockdown settings to use) and interpret the automated flagging.

For the latter, an alternative approach could be not expecting instructors to handle the interpretations of outcomes themselves at all. Instead, support staff could be given the necessary training (or given more time/resources to experiment) and take on the role normally filled by an invigilator, reporting only the genuinely suspicious behaviours to instructors for review. This approach would be more inline with how in-person proctoring works.

If they are reviewing recordings themselves, instructors advised colleagues be trained to save this step for last. Viewing how a student composed an answer first *"might introduce bias when you then look at their answers, because you've seen how long they've spent on it or how many references they were using"*, and this prejudging is not fair to the student.

#### 4) Include test runs for both instructors and students

<b>May address</b>	<ul style="list-style-type: none"><li>• <a href="#">Insights from setting up and monitoring assessments</a> (instructor benefit)</li><li>• <a href="#">Stress dealing with students' technical &amp; privacy issues</a> (instructor issue)</li><li>• <a href="#">Difficulties dealing with technical issues</a> (student issue)</li><li>• <a href="#">Uncertainty around how automated flagging works</a> (student issue)</li></ul>
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Since this was a pilot and new in all courses, instructors tested out Proctorio in advance of doing a real assessment and set up opportunities for their students to do the same. However, test runs would clearly benefit anyone new to Proctorio and/or remote proctoring, since as one instructor summarized, it's *"a lot more comforting if you've already succeeded once before you're trying to take something for grades"*.

On the student side specifically, instructors advised 1) labelling the Proctorio practice assessment appropriately (to make clear students do not need to study anything ahead of time), 2) encouraging students to try out all kinds of different actions during the session (including restricted ones), and 3) offering an incentive for completing the practice to increase participation. Additionally, using practice questions as a way to highlight important

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parts of the Proctorio experience could help students interactively understand restrictions (e.g., asking questions like ‘Do you know that you can’t x during Proctorio assessments?’ or ‘Which of the following are not allowed during Proctorio assessments?’).

## 5) Explain to students explicitly how restrictions and flagging work

<b>May address</b>	<ul style="list-style-type: none"><li>• <a href="#">Positive sense of overall fairness</a> (student benefit)</li><li>• <a href="#">Uncertainty around how automated flagging works</a> (student issue)</li><li>• <a href="#">Challenges in finding good assessment location</a> (student issue)</li></ul>
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As noted earlier, what and how Proctorio flags suspicious behaviour was a point of anxiety for students. Instructors heard directly from some after their assessments wondering “*did I do okay? were there any flags?*”, especially if noises had occurred in the background and “*they weren’t sure the consequences of that*”. Instructors in the pilot came to realize it was important “*to clearly explain to the students what was going to happen if they did certain things*” and to strongly stress “*not everything that is being monitored will be flagged*”.

Students need to hear that a flag on their recording doesn’t automatically mean the instructor will assume they cheated or that they will receive a grade deduction; human interpretation of the outcomes still plays a role. Additionally, when using certain combinations of restrictions that can end assessments early, students should be told “*if you do these actions, you will be kicked out of the exam*” and how the process of re-entry works.

## 6) Create a common privacy reassurance for students

<b>May address</b>	<ul style="list-style-type: none"><li>• <a href="#">Stress dealing with students' technical &amp; privacy issues</a> (instructor issue)</li><li>• <a href="#">Feeling of privacy violation</a> (student issue)</li></ul>
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For some students “*using Proctorio felt like being spied on*”, but this feeling could potentially be lessened with better transparency. As one student described, “*I am not sure if the program will keep my recording forever, or who specifically gets to view it. Providing more details about who has access to our recording would be more helpful.*”

Rather than rely on individual instructors to prepare and distribute details, perhaps a central UBC-specific reference point could be developed in student-friendly language, with

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instructors directing students there and students able to ask follow-up questions from this resource to someone other than their instructor.

## 7) Prepare a Plan B for students who can't access (or opt out)

<b>May address</b>	<ul style="list-style-type: none"><li>• <a href="#">Stress dealing with students' technical &amp; privacy issues</a> (instructor issue)</li><li>• <a href="#">Difficulties dealing with technical issues</a> (student issue)</li></ul>
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Since students may encounter unresolvable technical issues or opt out of consenting to video recordings, instructors need to have a Plan B for how they will accommodate these individuals. This plan should include equal scrutinization to remote proctoring (i.e., involve invigilation) to keep things fair for everyone.

Implementing Proctorio with these recommendations may resolve some of the concerns brought forward by instructors and students and improve future users' perceptions of the tool's pedagogical value.

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# Appendices

## Appendix A - Instruments

### A.1) Instructor interview questions

1. What were your main reasons for wanting to try Proctorio?
2. How did you use the reporting features in Proctorio to gather information?
3. How did using Proctorio affect your time commitment for this course?
4. What behaviour settings did you use and how many flags that Proctorio found turned out to be real issues vs. false alarms?
5. Based on your experience, what main benefits do you see to using Proctorio?
6. What main downsides or inconveniences do you see to using Proctorio?
7. On a scale from 1 to 5, with 1 being “strongly disagree” and 5 being “strongly agree”, rate how much you disagree or agree with the following. (Scale: Strongly disagree - Somewhat disagree - Neutral - Somewhat agree - Strongly agree)
  - a. Proctorio’s capabilities met my requirements for online assessment
  - b. Proctorio was easy to use
8. If you needed pedagogical/technical support for Proctorio, how did you get it?
9. On a scale of 0 to 10, with 10 being highest, how likely are you to recommend Proctorio to a colleague or friend for use in teaching and learning?
10. What advice would you give other instructors considering using Proctorio?
11. Is there any other feedback you’d like to provide? Anything good or bad about your experience we haven’t yet discussed?

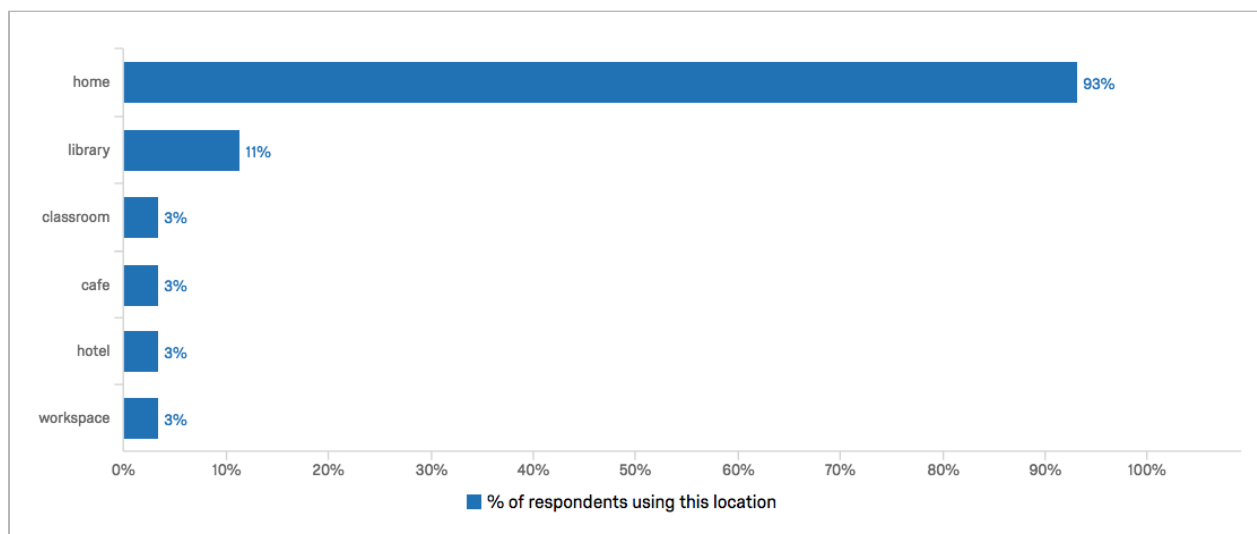
### A.2) Student survey questions

1. Where did you take your Proctorio assessment(s), e.g., at home, at a library, etc?
2. On a scale from 1 to 5, with 1 being “strongly disagree” and 5 being “strongly agree”, please rate how much you disagree or agree with the following. (Scale: Strongly disagree - Somewhat disagree - Neutral - Somewhat agree - Strongly agree)
  - a. Meeting Proctorio’s technical requirements was simple
  - b. Proctorio’s capabilities met my requirements for online assessment
  - c. Proctorio was easy to use
3. How would you describe your experience using Proctorio in this course?

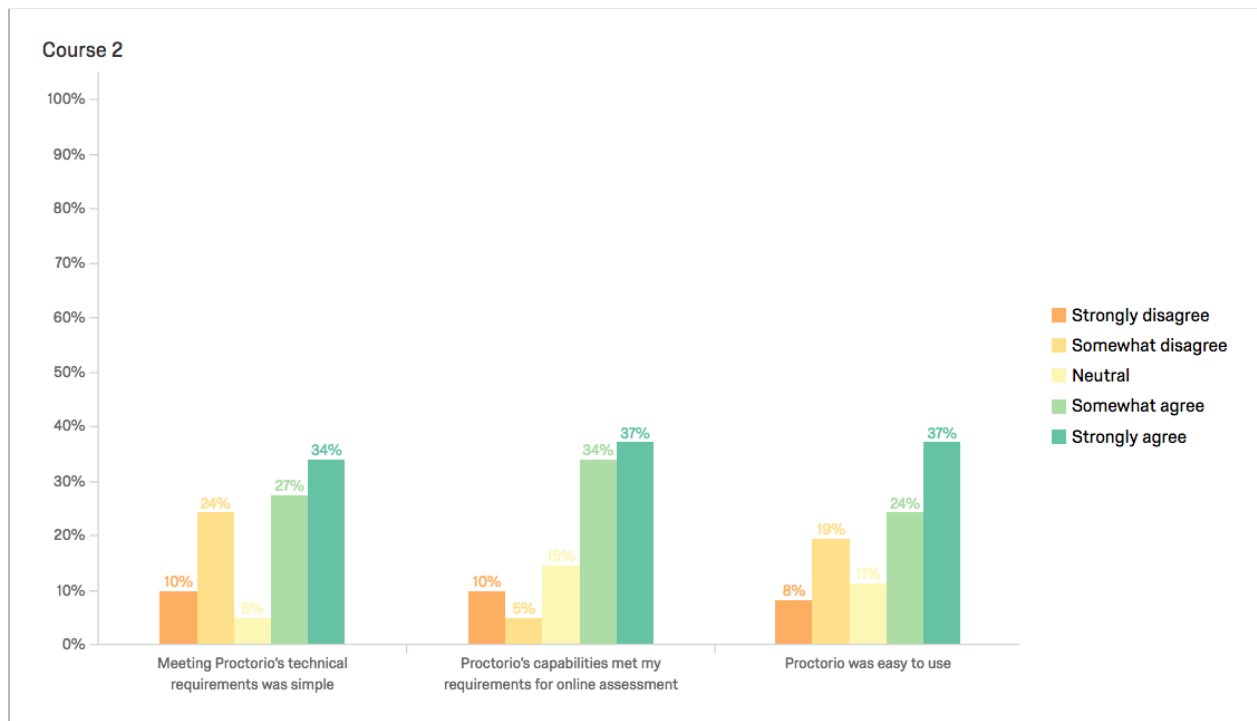
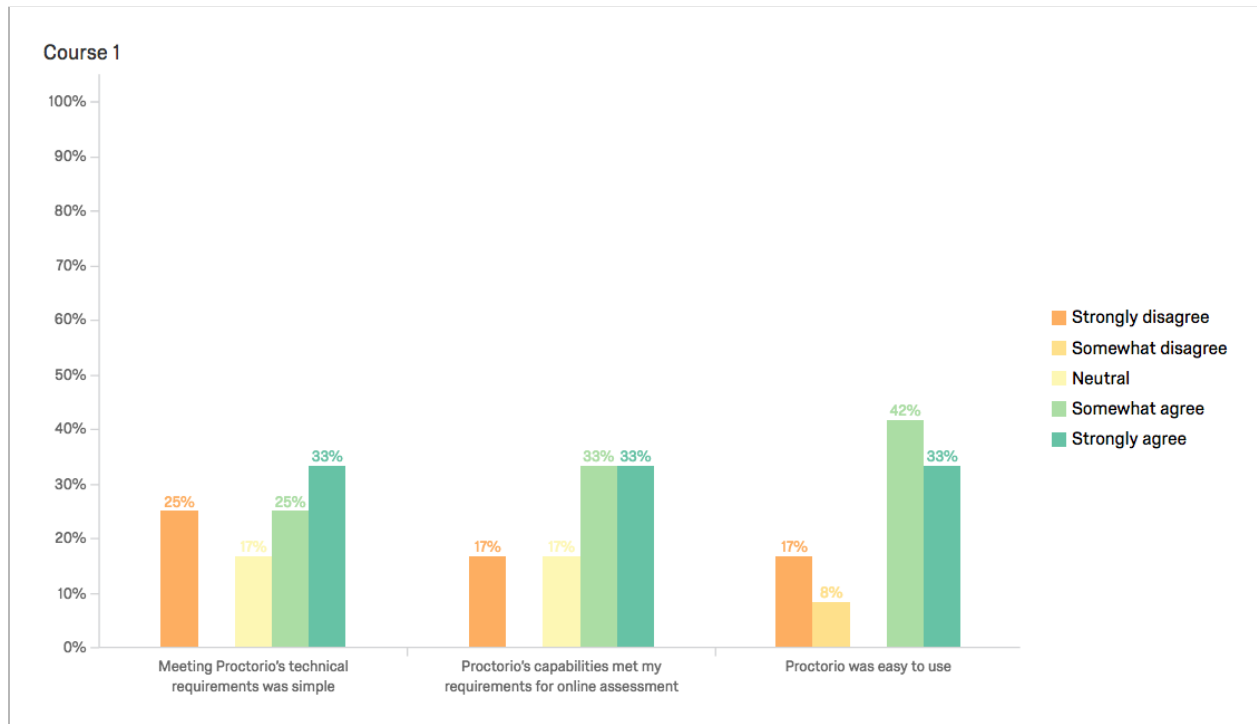
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- a. Very negative
  - b. Somewhat negative
  - c. Neutral
  - d. Somewhat positive
  - e. Very positive
4. What did you like or not like about using Proctorio?
  5. Compared to taking an in-person assessment, please rate the following for taking an assessment online with Proctorio. (Scale: Worse with Proctorio - The same - Better with Proctorio)
    - a. My stress level in taking an assessment was...
    - b. My ability to focus while taking an assessment was...
    - c. The sense of fairness I felt about taking an assessment was...
    - d. The overall challenges of taking an assessment were...
  6. What is your preference for future exams at UBC?
    - a. More assessments offered in person
    - b. More assessments offered online, but using something other than Proctorio
    - c. More assessments offered online using Proctorio
  7. Is there any other feedback you'd like to provide?

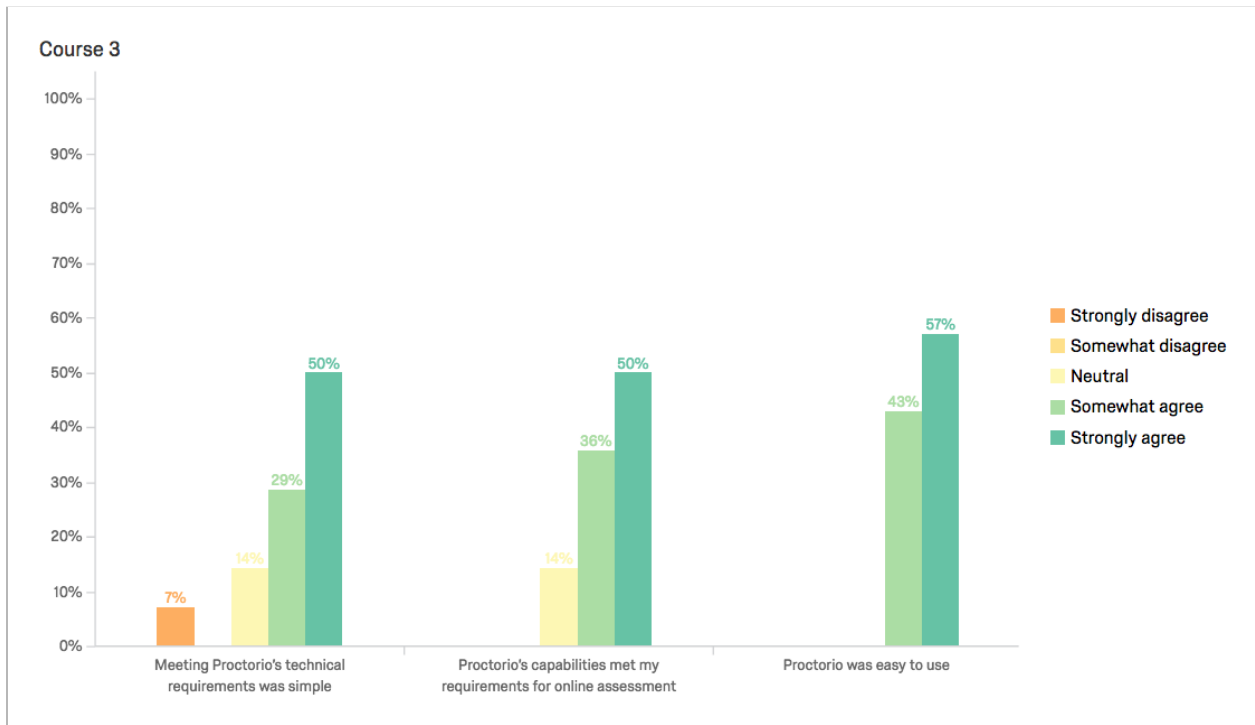
## Appendix B - Compiled Student Data

### B.1) Where did respondents complete their assessments? (N = 88)

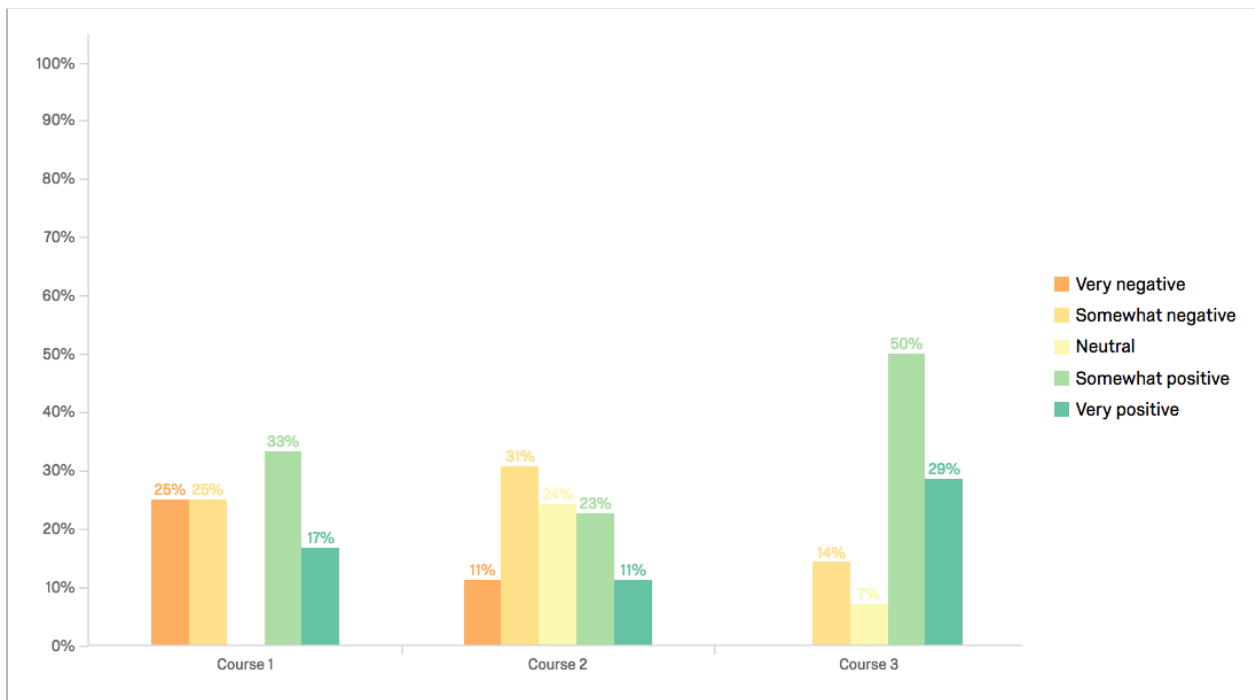


## B.2) How was Proctorio to set up and use for respondents? (N = 12, 62, 14)

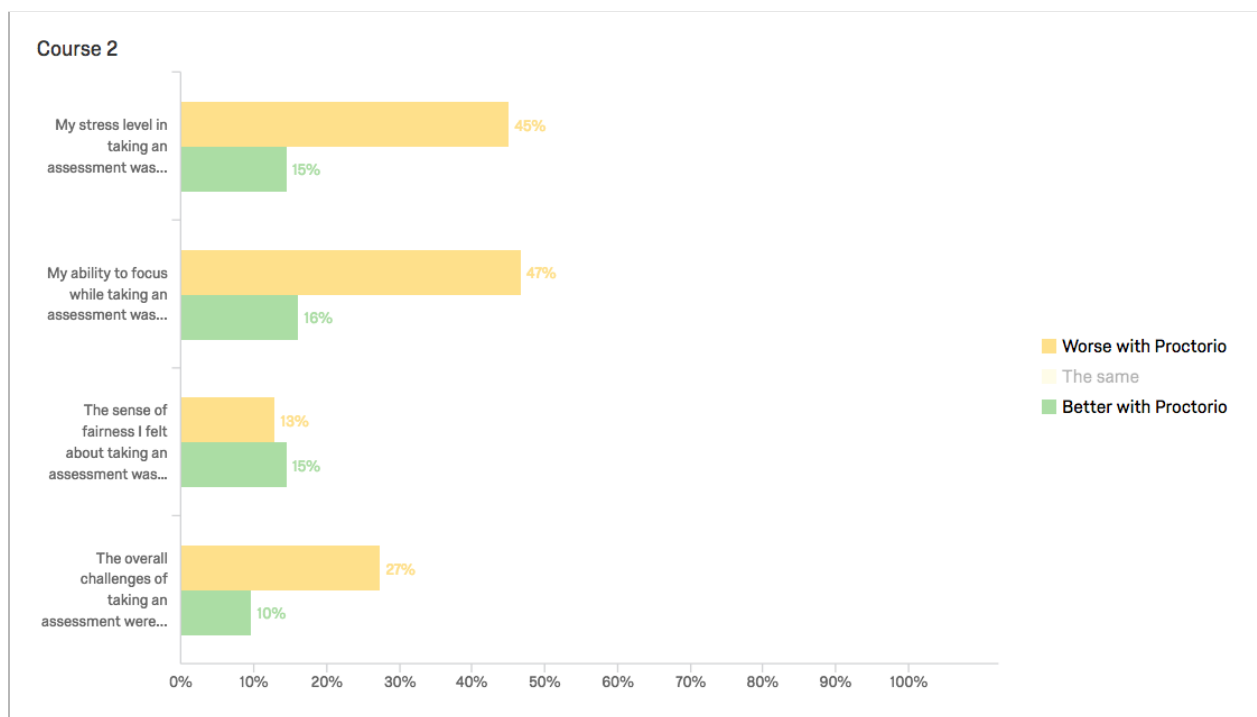
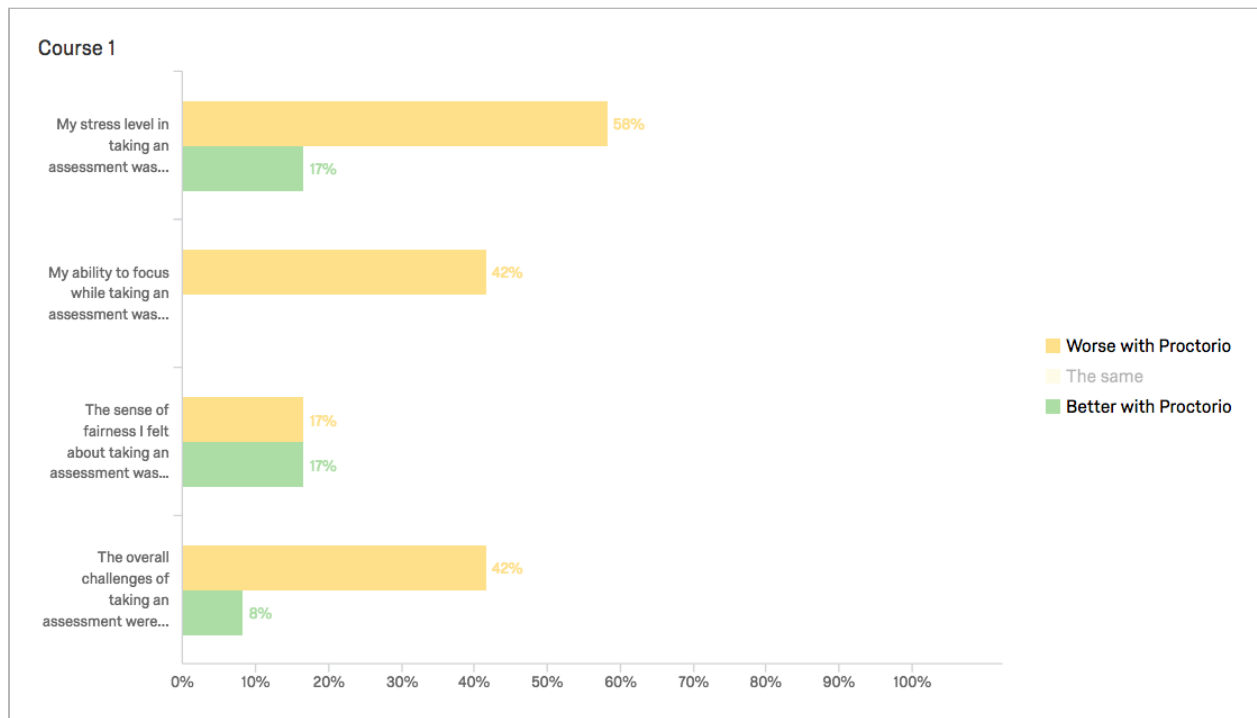




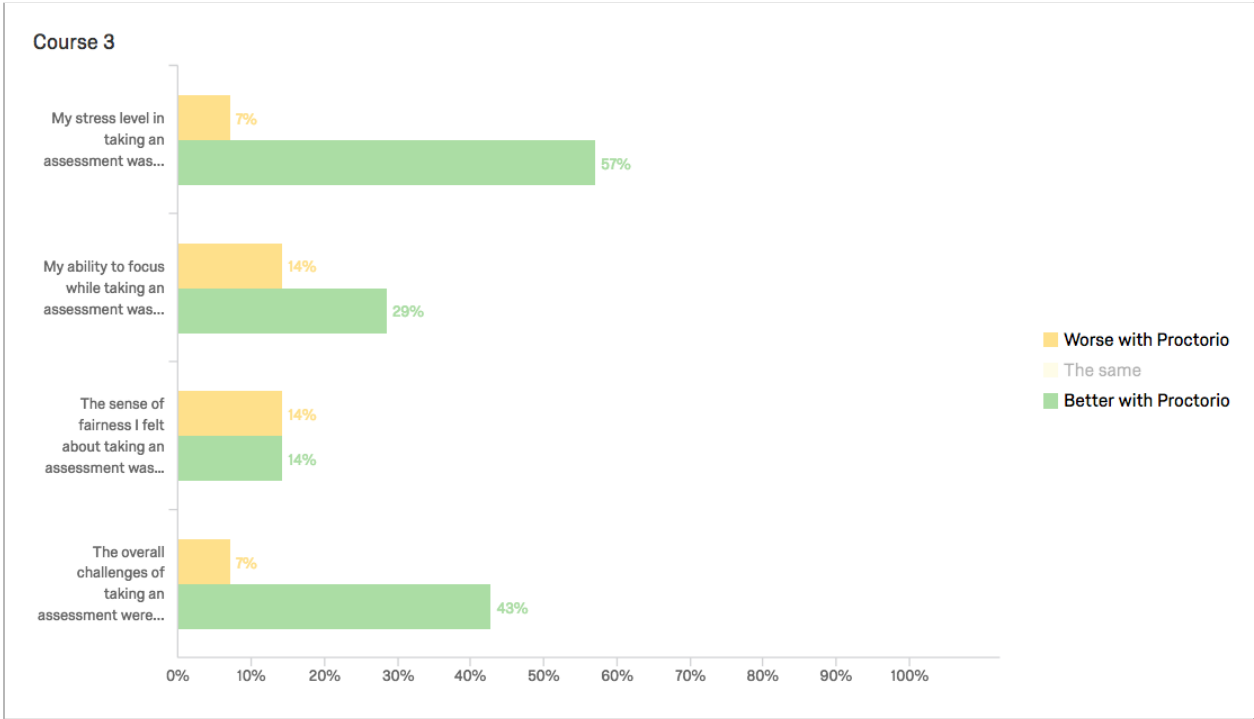
**B.3) How did respondents rate the overall experience? (N = 12, 62, 14)**



## B.4) What aspects of assessment-taking were better or worse? (N = 12, 62, 14)

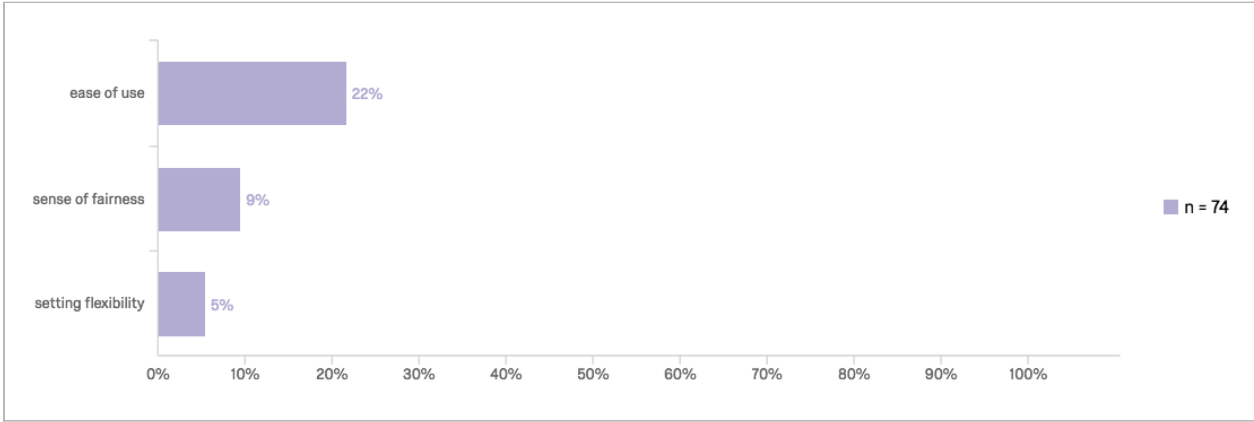


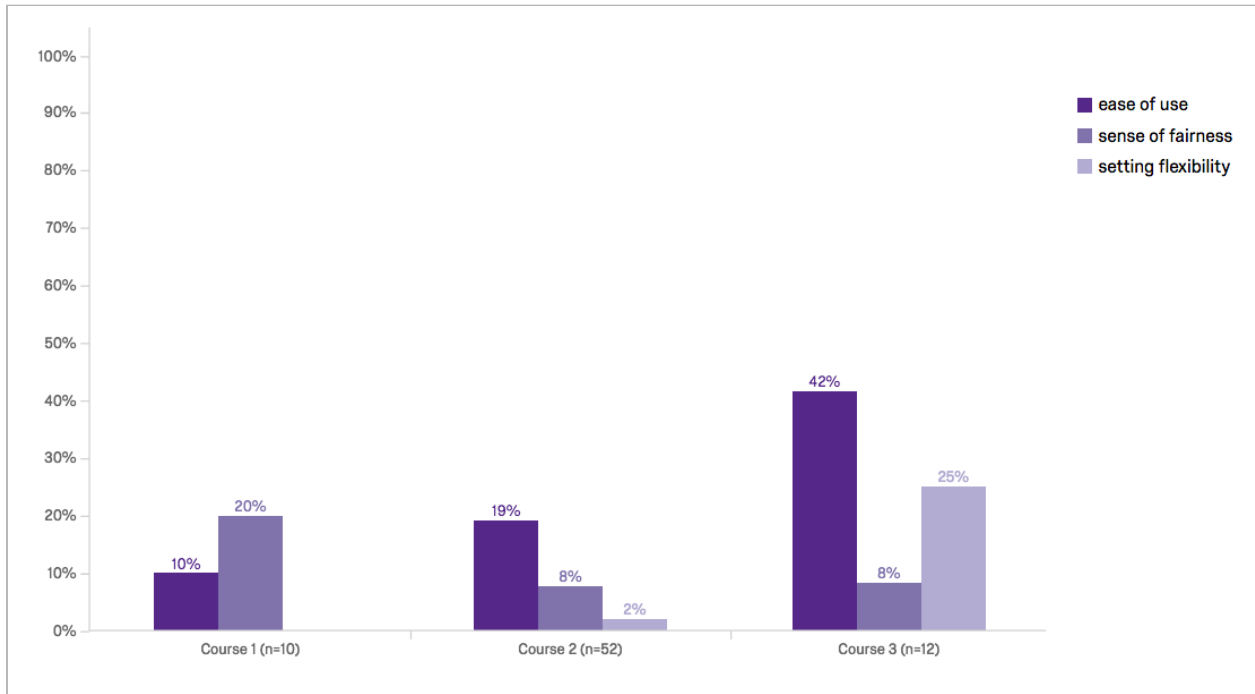




**B.5) What did respondents comment positively on? (N = 74)**

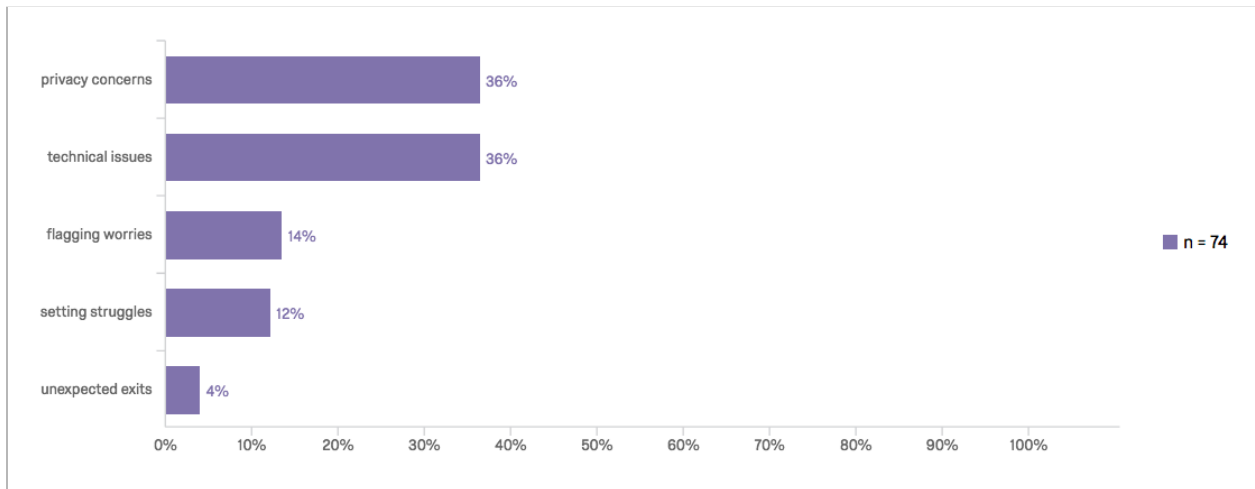
(See: [Qualitative codes](#) for this question)

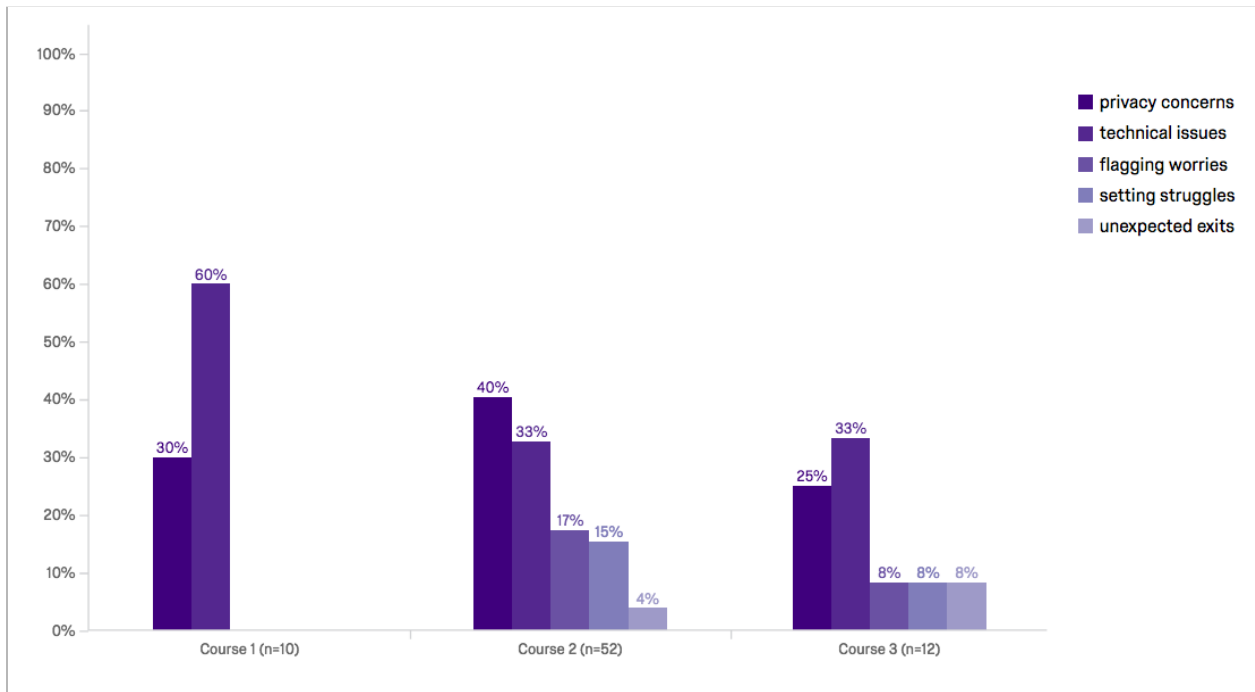




## B.6) What did respondents comment negatively on? (N = 74)

(See: [Qualitative codes](#) for this question)





**B.7) What did respondents prefer for future UBC exams? (N = 12, 62, 14)**

