Support for high-stakes exams in Open edX with SafeExamBrowser

Introduction

High-stake exams and MOOCs belong to two separate worlds with little contact if at all. Typically, in MOOCs there are low stake exams, sometimes remotely proctored or completely without proctoring used for gathering some sort of certifications for passing a MOOC. It comes as little surprise that there is not very much adaption made in Open edX towards supporting high-stake exams until now. But is there even demand for this? Yes, and no. In the world of real MOOCs there might be still some time needed until higher educational institutions may accept remotely proctored high-stake exams, interchange and accept certificates, etc. However, when focusing on SPOCs the situation changes drastically. With SPOCS as part of the curricula of Swiss higher educational institutions it is obvious that high-stake online exams need to be supported as well.

The goal of an integration of SafeExamBrowser (SEB) with Open edX is to provide a safe environment for high-stake online exams. But lower stake exams would also profit from such an integration, as we will explain below. SEB is licensed under the Mozilla Public License, available as freeware and an open source project since 2009. In 2016 the SEB Consortium has been founded which is the body that sustains ongoing funding of the Safe Exam Browser open source project to continue its maintenance, development and support activities.

Importance of SafeExamBrowser for online exams

SEB is a kiosk software (lockdown browser), which secures computers used as exam clients, while an online exam is taken. SEB is currently available for Windows, macOS and iOS computers and tablets. SafeExamBrowser as a kiosk browser in general works with any web based exam system. You enter the URL of your exam system in SEB's settings and set a method to end the secure lockdown mode of the browser when the exam is finished (quit password or quit link URL). With various additional settings you can configure how SEB should display the exam, restrict internet access with a URL filter, temporarily change browser and network settings/security (using pinned server certificates etc.). With SEB you could also increase the pedagogical value of exams by allowing third party applications to be used securely during exams, including complex software as for example Excel, Matlab, R-Studio, Eclipse. You can also allow additional resources for exams to be used, for example lecture scripts, external web databases or full HTML5 web apps.

Through its simple and clean interface for examinees, SEB helps keeping distractions low during exams. It also prevents all kinds of unwanted browser features, add-ons and system notifications to disturb students. When all students are using SEB for an exam,

you prevent compatibility and stability problems which are unavoidable if students would use different web browsers with an unpredictable number and variety of browser extensions/add-ons installed. This would be a big plus even for low-stake exams, where providing security against cheating isn't so or at all important.

For high-stakes exams on the other hand it is very important to ensure that:

- the exam can only be taken with the secure kiosk browser;
- that students cannot access other websites for internet search and communication with other examinees or people from outside who could help to solve exam questions;
- students cannot switch to other applications on the exam computer, as they might for example access the internet using a not secured regular web browser or chat with other people using a messaging application;
- files saved on the exam computer, a USB or network drive cannot be opened, otherwise it would be too easy to use electronic cheat sheets or not allowed resources prepared before the test;
- optionally an exam can be monitored or proctored electronically (using status information, screen recordings and maybe even webcam live video), so exam invigilators have additional means of proctoring an exam besides having to walk around in between students sitting in an examination room.

While SafeExamBrowser can help to ensure such security measures, in some cases it is necessary for the secure browser to be exchange information with the exam system (beforehand and during the test) or even to communicate with an additional security element running centrally on a server.

SEB Integration with Open edX

With an SEB integration in Open edX we mainly want to restrict access to exam modules, which can be composed of various XBlocks in Open edX. So students should only be able to take exams with restricted access if an approved SEB version with correct security settings is used. Therefore, a setting option for the course administrator needs to be added to the backend to control these access restrictions. Current versions of SEB provide an interface for exam systems to check for an approved SEB versions and settings (see specification document) and various exam systems including quiz modules of learning management systems (LMS) have integrated this interface into their core code (for example OpenOLAT, Inspera Assessment) or into plug-ins (Moodle, ILIAS). This kind of integration with SEB provides the required check of an approved SEB version with correct settings being used for an exam. Further steps of integration are possible, depending on the needs of the examiners and their institutions.

SafeExamBrowser website: http://safeexambrowser.org
SEB Consortium: http://safeexambrowser.org/consortium