SEB User Exchange: Resource-Rich Online Examinations with Third Party Applications @ ETH Zurich
1. Online examinations @ ETH Zurich
2. “Resource rich” examinations
3. Online examinations as service
4. Technical setup
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Online Examinations @ ETH Zurich: Terminology

- Online
- Summative
- With credit
- Proctored
- On campus
- Managed infrastructure

Diagram:
- e-assessment
  - online-assessment (online-exam)
    - internet
  - disconnected computer
    - intranet
Online Examinations @ ETH Zurich: Overview

- 2007 first pilots, 2010 regular service
- ~130 exams with ~10’600 students in spring term 2019
- High proportion of selective, high-stakes examinations
- Summative examinations designed by lecturers
- Important role of first year university examinations in Switzerland
Online Examinations @ ETH Zurich: Impressions

Images: Alessandro Della Bella
Agenda

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Why Resource Rich? → Examination Quality!

1. Improve learning outcomes by making examinations more meaningful and motivating to students

2. Improve measurement quality (i.e. validity) of competence assessments
Resource rich examination: Statistics II – Exam in R-Studio
Resource rich examination: Online-Exam in Crop Pathology III

Preparation of specimen for analysis and diagnosis on an USB-Microscope. Upload of microscope images to a Moodle exam.
Resource rich examination: Introduction to Software Engineering
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Always keep in mind

Online examinations need to be as secure and fraud-proof as paper based examinations (no more, no less)!
Online Examinations as a Service: Technology + People + Processes = Service

Technology: requirements
- Secure, fraud-proof
- Reliable, robust
- Easy to use, familiar (for students, for examiners)
- Easy to customize and manage (for administrators & examiners)

People & processes required to
- monitor systems
- handle incidents
- support examiners & students
- coordinate between stakeholders
- address stakeholder needs
- implement improvements

⇒ Technology & infrastructure alone do not suffice
Online Examinations as a Service: Technology + People + Processes = Service

Legend:
- Orange: Rectorate
- Green: Departments
- Gray: IT services

Examinations office
Room reservation

Faculty
Students

LET
Operations
Didactics
Technology

Service Owner

Network infrastructure
Examination clients & deployment
VDI & server infrastructure
Examiners Tasks

Same tasks as in paper based examinations (e.g. create questions, bring along enough supervisors, check identity....)

+ send the files for the examination to LET early enough

+ Testing and approval of VDI-environment @ LET
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Online Examinations with SEB and Third Party Applications: Architecture
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Technical Setup: Why Third Party Applications on VDI?

• Examination client only needs OS, SEB and VDI-client
• Certified examination environment by examiner → 1:x copy
• Easy backup of files during examination
• Easy to manage software licences
• Easy to block access of third party applications to the web (e.g. built in help browser or installing additional R-packages)
• No access to student shares, drives and other private resources
Third Party Applications Used in Examinations @ ETH Zurich

- Adobe Reader
- Anaconda (Jupiter Notebook, Python)
- Berkeley Madonna
- Julia with Atom, Notepad++, Visual Studio
- MathType
- Matlab
- Microsoft Excel (incl. add-ins)

- Microsoft Visio
- Microsoft Word
- Notepad++
- RStudio / R (different packages)
- SPSS
- Stata
Questions
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