e-Exam System Overview
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Get the demo and user guides
http://transformingexams.com

Acknowledgement
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Targeting...
• Supervised
• High stakes
• On campus
• Large scale

(image credit: Dr Fluck UTAS)

What we are not specifically addressing here is off campus, online only, distance education, cross institutional students – there are some existing e-solutions to address these needs.
Why e-Exams?

Rationale


Concerns, drivers, solutions for e-Exams (a 'wicked' problem!) – a clear need to take a whole of system approach – not just software!

bit.ly/eexam-map
Essentially...
We are faced with a growing disconnect between the way high stakes testing is conducted using pen on paper exams and students’ everyday experiences.
## e-Exam System Affordances

<table>
<thead>
<tr>
<th>Pertinent Features</th>
<th>Affordances</th>
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<tbody>
<tr>
<td>A 'Whole computer' environment (OS, LMS, applications...) on a stick.</td>
<td>Vastly expanded pedagogical scope over that of a browser window.</td>
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<tr>
<td>Typed student responses via Word processor, constructed via apps (human marked) or on-board learning management system quiz (computer marked).</td>
<td>Caters for introduction to advanced uses. Components added/removed to suit. Electronic collection facilitates analytics, item response analysis...</td>
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<tr>
<td>No live network required during exam, even for LMS questions.</td>
<td>Robust. Greater control. (network could be used for admin)</td>
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<td>Student owned equipment used as host and left untouched.</td>
<td>An ethical approach to scalability (no invasive software to install)</td>
</tr>
<tr>
<td>Modular, open source code base and commodity 'off the shelf' components.</td>
<td>Leveraging popular and sustainable projects for better efficiency. Fully 'known' (no 'blackbox'). Available!</td>
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<tr>
<td>One version works on most Intel based laptops - Apple, 'windows', Linux, that have a USB port.</td>
<td>One software version can serve all. Streamlines development and maintenance.</td>
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Bootable ‘live’ USB drive
Four-in-one demo system (desktop shown below)...

1. Word document based exams (paper equivalent / intro use S1 & S2 2014)
2. Word doc + multimedia + 3rd party software tools (more trials soon...)
3. LMS (Moodle) based exams (computer marked questions - TBA)
4. Remote (serves as a restricted gateway) to networked LMS.
UQ 2014 Trial: Paper equivalent exams

First stage: Paper 'equivalent' via on-board word processor. *This was used for Semester 1 and 2 2014 Trials.*

**To start an e-Exam:**

1. Student boots laptop with USB
2. Students type ID, name & click 'Start Exam' button
3. Student can now start typing

Note: Automated background processes...
The system copies Question file and renames it with the supplied ID. File is opened ready for the student to start (cover page info to be automated soon too!)
UQ 2014 Trial: Paper equivalent exams

UQ trials, Semester 1 and 2 2014: The aim was to explore the idea of BYOD e-exams, logistics, student impressions.

• Paper 'equivalent' exams, computer optional, students choose pen or keyboard.
• Mid term exams ~ 15% of grade.
• Question types used: essay, short answer, limited MCQs (type 'x' in a box), label a diagram/image (fill in a table; basic drawing features were available but not used by students). All manual marking – but at least it was typed text!
Responding to questions in-line in the word processor (note – the system keeps a read-only backup of the questions!)
Type where indicated....
Simple drawing tools...
Label a diagram...

Note: Drawing tool was available but not used.
**e-Exam System Processes**

**Process overview: set-up, use and assessment.**

**Set-up:** Prepare exam learning materials

- Academic creates exam learning material
- Create master USB (tested)
- USBs duplicated per student

**Pre-session:** Student Laptop setup.

- Exam room use
  - 1. Students enter room.
  - 2. Given USB.
  - 4. Do exam.
  - 5. Return USB.
  - 6. Leave room.

**Post lesson:** Retrieve responses and assessment

- Collated responses sent to academic.
- Responses retrieved from USBs.

*(Based on the e-Exam System by Hillier & Fluck 2013)*
Architecture of e-Exam System

Modular architecture so academics / institutions can choose the features and mode of operation that suit them... For 2014 UQ trials we kept to the basic features!

Current OLT project adds these features to v5 (not used in UQ trial):
- On-board LMS for computer marked question types (Moodle) [demo available]
- Improved answer reticulation/workflows [TBA – in progress]
Data collected from students (updated September 2014)

• Via pre-exam project online survey: See Hillier & Tran 2014.
  – UQ students surveyed about their preconceptions about e-exams.

• Via pre-exam short survey.
  – Conducted at the pre-exam practice setup sessions.
  – Covered: technical compatibility, hardware spec lists, student preliminary impressions.

• Via post-exam extended survey (see link below)
  – Conducted at the conclusion of the exam (in the room).
  – Covered: student exam experience, reaction to exam session conditions, e-exam system impressions, exam writing strategies and production, general non-exam writing strategies.

• Future analysis – production (words, language density, marks).
The Next phase: Post-paper exams with multimedia

**UQ 2015? TBA:** Post-paper exams via word processor (used at UTAS)
Include links to on-board media, PDFs and other software tools.
The next phase: can include software tools

Simulations, tools, virtual experiments, serious games...
Business, history, language/communication, science labs...

Including 'Windows' software; CAD / 3D modeling, Celestia via WINE

Ref: Dr Fluck, UTAS
The Future: LMS on e-Exam v5 (Demo)

Computer marked question types via on-board LMS (new to v5) with Integrated multimedia – high def video is possible!

Trials TBA!
The Future: LMS Question Types

Computer marked question types (Moodle)

**Standard [already in the demo]:**
- Calculated (Wildcards and datasets, calculated MCQ)
- Matching
- Embedded Answers (Cloze Test / Gap Fill – text with multiple choice, short answers and numerical answers)
- Short Answer (sentences)
- Numerical
- True/False
- [Short essay - with response template - human marked]

**Custom types:**
- Algebra, Multinumerical, Spreadsheet,
- Chemistry Molecular editor questions,
- Music (key signature, scales, intervals)
- Hot spots, drag and drop (labels, text, images),
- Set splitting,
- Missing words, Gapfill,
- Regular expression...

**Marking:** delayed, Certainty-Based Marking... manual override.
The Future: Advanced Example - Virtual 3D Spaces

Proposal for offline Virtual OSCE, practicals etc. Technology is already working 'online'.

Set up Quiz in the LMS. Results are stored in the in grade book.

A set of scripts for Moodle and VW that acts as a bridge.

Student undertakes assessment in the virtual world

Online (Second Life) examples see http://www.transformingassessment.com/secondlife.php
Remote connection to networked LMS

Computer marked question types via institutional LMS
Needs network. Provides a restricted gateway – e.g. demo can *only* connect to UQ Blackboard (IP address) and no other server. New to v5.
Trials TBA – *dependant upon reliable/robust network connections!*
More information....
Demo set-up Guide,
Student Practice and User Guide

http://transformingexams.com

Demo videos start-up, use and recovery examples.
'Wintel' (Dell)  http://bit.ly/eexam-demo-vid-d
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Cite this resource: