OLT e-Exams: Ramping up the authenticity of high-stakes supervised assessment for the 21st century

Dr Mathew Hillier
Monash University

Presentation for Macquarie
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TransformingExams.com
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Transforming Exams Across Australia

Australian Government Office for Learning and Teaching
National Grant ID15-4747: AU$500K over 3 Years + 100K Monash

<table>
<thead>
<tr>
<th>Dr Mathew Hillier; Leader OLT national project. Seed leader</th>
<th>Monash University (was University of Queensland)</th>
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</thead>
<tbody>
<tr>
<td>Dr Andrew Fluck; Originator of USB e-exam concept. Seed partner.</td>
<td>University of Tasmania</td>
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<tr>
<td>Dr Michael Cowling, Mr Kenneth Howah Seed trial site.</td>
<td>Central Queensland University</td>
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<tr>
<td>Dr Kim Blackmore</td>
<td>Australian National University</td>
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<tr>
<td>Assoc. Prof. Paul Newhouse</td>
<td>Edith Cowan University</td>
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<td>Dr Matthew Bower, Prof. Dominic Verity</td>
<td>Macquarie University</td>
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<tr>
<td>Prof. Marilyn Baird (H), Mr Scott Grant (A)</td>
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<tr>
<td>Assoc. Prof. Shona Leitch</td>
<td>RMIT University</td>
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<tr>
<td>Dr Ruth Geer, Mr Bruce White</td>
<td>University of South Australia</td>
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Acknowledgements - Diamond and Gold Sponsors!

500K in support for this project has been provided by the Australian Government Office for Learning and Teaching. The views expressed do not necessarily reflect the views of the Australian Government Office for Learning and Teaching or participating institutions.

100K additional cash from Monash University.
Is this your exam space?
Actually it looked more like this and they locked you in for 3 days!
Questions to ponder

1. Why do we do exams?
2. Are exams still needed?
3. Can we do exams better?
4. How can we do better and what does it take?
Take 3 minutes

- In pairs, discuss should we still keep doing exams?

Then, share with the room
  - Two reasons to keep (why we do them)
  - Two reasons to reduce
Possible reasons to keep exams

High stakes, supervised testing is still needed because:

• Qualification identify verification (be sure it is the student’s work – rise of ghostwriting/outsourcing)
• A test of the student’s ‘metal’ under pressure.
• Accreditation requirements.
• Social/political stakeholder expectations.
• Time and workload efficiencies?
• Other reasons ... ?
Possible reasons to reduce exams

Paper features...

• Limited pedagogical scope... MCQ/TF, short/essay response, flat and static, images/diagrams.

• End product (final response) rather than process.

• What they remember rather then what they can do (given access to real world conditions).

• Hand-written pen-on-paper is much less common as a problem solving and information presentation tool.

• Other areas of education delivery – progressive, formative assessment has moved towards richer forms of assessment, modern tools, simulations, multimedia, word processed, information repositories...

Is this limiting our ability to accredit graduates as being able to operate in the world of today, immersed in technology, information and complexity?
Institutions must be able to certify their capabilities to operate in the 21st Century world. We need fit for purpose, valid, authentic, assessments.
### 21st century employability skills

**Quality Assessment = fit for purpose!**

| Ways of thinking         | • creativity and innovation  
|                          | • critical thinking, problem solving  
|                          | • learning to learn, metacognition  
| Ways of working          | • communication  
|                          | • collaboration (teamwork)  
| Tools for working        | • information literacy  
|                          | • ICT literacy  
|                          | • discipline resources and tools  
| Living in the world      | • citizenship – local and global  
|                          | • life and career  
|                          | • personal and social responsibility (including cultural awareness and competence)  

[http://atc21s.org/](http://atc21s.org/)

21C Learners

- skilled use of tools ... *as appliances? for learning purposes?*
- active learning rather than passive receiving of knowledge
- authentic learning experiences rather than contrived tasks
- construction rather than instruction
- task (not process) oriented
- just in time learning
- search not memorise
- utilise social networks
- doesn’t know answer but knows where to find it
- Google not libraries
- collaborate not compete.

Elliott, B (2007)
Community expects:
Employers, professional bodies and the community are expecting graduates to be able to perform appropriately in proactive, task-directed ways where they implement their discipline specific knowledge in a context that involves many stakeholders.

But…
Universities are more often concerned with students mastering the conceptual understanding of core discipline principles and applying these to artificially constructed tasks designed for assessments that can be easily delivered and marked.

Good for us?    Maybe not so good for student learning…?
A rethink is under way… in the broad curriculum.

We are doing better curriculum design… that facilitates both the development and assessment of discipline skills and capabilities, as well as the application of these skills and capabilities … when done well this reflects are more authentic environment with collaboration with other people, information resources, modern tools of the trade.

The real world is messy, complex, contradictory, uses a range of information sources, tools, perspectives, stakeholders and techniques.

We need to move along the continuum from the artificial towards the authentic.
Assessment options in LMSs

<- Moodle     Blackboard ->

Some computer marked while others require human intervention.

Drive towards higher order thinking.

How about … have students use tools to develop solutions and then respond via LMS.

Many more Moodle examples transformingassessment.com

Blackboard course archive available upon request.
http://moodle.transformingassessment.com/
Interactive tools in assessment

1. Student clicks a link embedded in the quiz to launch a separate app.
2. Undertakes a task as instructed.
3. Then responds using selected response or numerical input to suit.

Open the trading forecast applet to assist in matching the following statements. Click on 'Cash flow' to enter sales data as shown in the following diagram.
Interactive tools in assessment

Spreadsheet linked to quiz

Question 2
Not complete
Marked out of 1

Flag question
Edit question

Use the elasticity spreadsheet to assist in matching the following statements.

For an elastic demand, as the price increases
Choose...

For an elastic demand, as the elasticity increases
Choose...

For an inelastic demand, as the elasticity increases
Choose...
Interactive tools in assessment

Jmol: Open-source Java viewer for chemical structures in 3D

Moodle Quiz

1. Which structure shown below represents meso 2,3-dichlorobutane, A, B or C? [Click on the text below to open a window with the three choices]

   Three structures, A, B and C

   Answer: 

   Submit

2. Use the Jmol applet to view the crystal structure of the presented molecule. Use the Jmol applet display to match the following statements.

   There are 7 stereogenic centres in the molecule
   Choose...
   Choose...

   There is evidence for an intramolecular hydrogen bond
   Choose True
   False

   There is evidence for an intermolecular hydrogen bond
   Choose True
   False

   Submit

3. Use the Jmol applet to view the molecular structure of the presented molecule. Use the Jmol applet display to match the following statements.

   The most electron rich region of this molecule is
   Choose...

   The most electron poor region of this molecule is
   Choose...

   The lowest energy molecular orbital for the molecule is
   Choose...

   The highest energy molecular orbital for the molecule is
   Choose...

   Submit

Students interact with online tools to obtain data to construct a response

More examples in Moodle at transformingassessment.com
Simulated Conversation (Monash)

Students respond to a series statements via MCQs (maybe, yes, no) with feedback per choice to simulate a conversation e.g. Moodle lesson activity.

Can subterfuge be honourable?

Question 1 of 4

A problem

Two researchers in social medicine have devised a plan to investigate the hidden milieu of online anorexic communities. They are extremely secretive and members on pro-ana sites are suspicious and exclude all forms of research. One of the investigators adopts a pseudonym, uses the language of youth and projects all the neuroses to gain acceptance. How ethical is this methodology?

A response

It sounds ugly but we have to remember that anorexia is a serious condition, akin to suicide, and unless we understand how it is handled, we cannot advance medical science.

☑ Maybe
☐ Yes
☐ No

Feedback

Good answer, Maybe. But this response doesn’t answer the ethical question. It’s true that we want to understand anorexia; but does that mean that we have to resort to deception. The investigators are conducting themselves in a somewhat fraudulent spirit.

Examples – Short text response

Students type in a short sentence response which can be marked by computer based on pattern matching.

Available in standard Moodle.

Example question

A boy climbs slowly to the top of a slide and then slides down it. At which point will his kinetic energy be a maximum? Note: Your answer should ignore the effects of friction.

You should give your answer as a short phrase or sentence.

Kinetic energy will be at maximum when at the bottom of the slide.

Sally Jordan, Open Uni UK, TA webinar, 5 June 2013 transformingassessment.com/events_5_june_2013.php
Examples – Confidence questions

Confidence based approaches penalise guessing. Students need to choose a response and declare their level of certainty. Available in standard Moodle.

<table>
<thead>
<tr>
<th>Certainty level</th>
<th>C=1</th>
<th>C=2</th>
<th>C=3</th>
<th>No Reply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mark if correct</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Penalty if wrong (T/F Q)</td>
<td>0</td>
<td>-2</td>
<td>-6</td>
<td>0</td>
</tr>
</tbody>
</table>

**Qu. 1:**

Which structure shown below represents meso 2,3-dichlorobutane, A, B or C?

[Click on the text below to open a window with the three choices]

Three structures, A, B and C

Choose **one** of the following:

- C
- A
- B

Certainty v Mark Expected

[Graph showing expected marks based on certainty]

Tony Gardner-Medwin, UCL, TA Webinar  6 April 2011
You are required to construct a 500 word argument that either supports or refutes the statement 'Some historians claim that the Bayeux Tapestry is not an historical record of the Battle of Hastings, but rather it is simply Norman propaganda'.

You will need to use this QuickTime virtual reality link to view the Bayeux Tapestry to assist you in selecting and describing two scenes that you will use as the basis for your argument.

Click on this link to the assessment rubric to view the marking criteria for this task.

Answer:
VR, 360deg, spherical images

Virtual reality, 360-degree images, spherical images.
Take students to places they would not otherwise be able to go...

http://www.pbs.org/wgbh/nova/subsecrets/nautconhi.html

http://www.pbs.org/wgbh/nova/subsecrets/nauttorlo.html
Lab Simulations

Physical hardware can be connected to the internet or we can use **software simulations** of labs and experiments.
More Simulations

A/Prof. Pierre Benckendorff (University of Queensland, Australia)

OLT work: bizsims.edu.au (31 Sims listed/reviewed)

Complex simulations designed to teach strategy, competitive analysis, finance, marketing, HRM, cross-functional alignment, and the selection of tactics to build a successful business.

3D Virtual Spaces

- Sloodle (Second Life in Moodle)
- QuizHUD
- Scripted chat bots
Moodle and OpenSim Working Together

Undertaking an assessment activity in the VW initiates data transfers to the LMS.

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

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

Student undertakes assessment in the virtual world.

Data flows as if the student was doing the activity in the LMS.

Videos: Transforming Assessment Youtube Channel
UQ Virtual Business Environment

TA webinar http://transformingassessment.com/events_5_august_2015.php
Sim Features - trading

1. Money
2. Attributes
3. Avatar
4. Text Chat
Sim Features: Obtain a loan, resolve disputes, buy supplies

Australian Bank's 'Loan Terminal'

We offer the following loan plans:

PLAN 1 - $100 @ 8.75%.
PLAN 2 - $300 @ 6.25%.
PLAN 3 - $500 @ 3.75%.

Please make your selection below.

- PLAN 1
- PLAN 2
- PLAN 3
- Ignore
The VBE App

Email  email@example.com
Password  password

Enterprise
- Boardroom
- Broadcaster
- Reports
- Logbook
- LogOut

Meetings
- Archived
- Marketing Strategy 2015
- Hi
- Practical Concrete Shirt
- Practical Wooden Shirt
Virtual Immersive Language Lessons (1)

Scott Grant (Monash University, Australia)
http://www.virtuallyenhancedlanguages.com

TA webinar http://transformingassessment.com/events_1_april_2015.php
Virtual Immersive Language Lessons (2)

Task Based Learning or Task Based Language Learning (TBLL). Includes communication activities, using language to carry out tasks, language use that is meaningful to the learner and has a purpose, and communication activities that reflect real-life activities with authentic materials.

Learn by doing:
Purchase supplies then cook noodles – all in Chinese.
Where does that leave exams?
The dissonance of it all!

Real world of work

Exams

We are faced with a growing disconnect between the way high stakes testing is conducted using pen on paper exams and students’ everyday experiences of study, work and life.
Take 3 minutes

- In pairs, discuss what would be an ideal exam?

Then, share with the room
- Two outcomes
- Two enabling features of an ideal exam
Better exams

• Lets make exams as good as they can be...
  – Broaden the pedagogical landscape in the exam room.
  – Give students access to the ‘tools of the trade of the twenty first century’...
  – To solve problems typical of those faced in the work and life world – wicked, messy, complex problems that require constructed responses.

• Challenge: must work with the pragmatics and requirements of existing education delivery.
  – Valid, robust, easy to use, efficient, economical, supportable... It must work in the world we have, not the world we wish we had!
Why and how of e-Exams

Rationale: Concerns, drivers, possible solutions for e-Exams. A truly 'wicked', 'messy' problem and a long road to get it right!...

Presented rationale in 2013 and Seed grant findings at 2014, 2015 ASCILITE confs. More to come ... and explored in depth in Hillier & Fluck (2013)

ta.vu/eexam-map
An evolution rather than a revolution. Some aspects may occur quicker then others depending on particular implementation, technical models chosen, socio-cultural-policy environment conditions. Outlook for Australasia. *Denmark and Norway already have ‘internet in exams’.*

<table>
<thead>
<tr>
<th></th>
<th>About now</th>
<th>2015-2020</th>
<th>2020-2025</th>
<th>2025 and beyond</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Medium for high stakes assessments</strong></td>
<td>Paper</td>
<td>Paper-replacement – students can opt to type instead of handwriting (uses USB drive to boot BYOD). Some post-paper exams appearing.</td>
<td>Post-paper exams common. All questions and materials are digital, a computer is required to respond to assessment challenges.</td>
<td>Fully computerised, internet enabled exams with candidates using a range of software and input devices.</td>
</tr>
<tr>
<td><strong>Connectivity</strong></td>
<td>None</td>
<td>None to some use of restricted ad-hoc networks for response reticulation in post-paper exams.</td>
<td>Mix of offline and online exams limited to selected resources. Connections logged.</td>
<td>Open internet access but all transactions are fully logged inclusive of communication, timing, sources.</td>
</tr>
<tr>
<td><strong>Authenticity of assessment</strong></td>
<td>Scenarios are written descriptions, with monochrome illustrations</td>
<td>Full colour diagrams and video begin to provide more authentic scenarios</td>
<td>High fidelity, data-driven simulations</td>
<td>Real-time links to global databases</td>
</tr>
<tr>
<td><strong>Candidate identity assurance</strong></td>
<td>Manual comparison of face with ID card photo by a trusted supervisor</td>
<td>Practice continues, linked to local database via handheld device.</td>
<td>Practice continues, but laptop camera takes pictures of the keyboard user at random intervals.</td>
<td>Practices continue, with two-factor authentication incorporating biometrics such as face recognition.</td>
</tr>
<tr>
<td><strong>Materials provided/allowed</strong></td>
<td>A range of published books, electronic calculators and stationery equipment bought into the room by students</td>
<td>Digital equivalents begin to replace some materials. E.g PDFs.</td>
<td>e-books, high resolution images, video, simulations, all software tools are provided (open source).</td>
<td>Practice continues with increasing diversity of subject-specific software tools.</td>
</tr>
<tr>
<td><strong>Assessment workflow</strong></td>
<td>Bundles of scripts are physically transported to assessors</td>
<td>Practice continues, but digital response scripts can be duplicated, archived and e-mailed.</td>
<td>Digital responses, extends to data files created using subject specific software. E-workflows, banked and tagged questions.</td>
<td>Digital response files are accompanied by performance metrics for individual students, and interaction logs</td>
</tr>
<tr>
<td><strong>Achievement measurement</strong></td>
<td>On quality of solution, and written process</td>
<td>Practice continues, analytics of selected response items.</td>
<td>Practice continues, but analytics increasingly detailed. E.g. time taken per question, marks gain.</td>
<td>Detailed analytics, keystrokes/screen touches available – the solution process dominates assessment.</td>
</tr>
<tr>
<td><strong>Continuous assessment improvement process</strong></td>
<td>Year-on-year bell-curve comparisons regulate overall difficulty of exam.</td>
<td>Some data on overall ease or difficulty of individual questions/ options is available.</td>
<td>Individual questions are rated for discrimination and reliability etc.</td>
<td>Question ratings take into account all candidate interactions within the assessment.</td>
</tr>
</tbody>
</table>

Our e-Exam Project...

• 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 extra issues (later!) and some possible e-solutions to address these needs.
## e-Exams: Online, Offline, On Campus or Distance

There are trade-offs for any e-exam solution.

<table>
<thead>
<tr>
<th>Online (net)</th>
<th>Off-Campus (controlled spaces)</th>
<th>Distance (at home)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Space issues for institutions.</td>
<td>• No space issue for institutions.</td>
<td>• No space issue for institutions.</td>
</tr>
<tr>
<td>• Improved exam management efficiency.</td>
<td>• More efficient exam management.</td>
<td>• More efficient exam management.</td>
</tr>
<tr>
<td>• Equipment: need computer labs to cater for 2000 at once or BYO.</td>
<td>• Students supply equipment.</td>
<td>• Students supply equipment.</td>
</tr>
<tr>
<td>• Most secure: live IT monitoring/control and spaces are supervised.</td>
<td>• Less secure: IT monitoring but wider spaces are unsupervised.</td>
<td>• Less secure: IT monitoring but wider spaces are unsupervised.</td>
</tr>
<tr>
<td>• Needs reliable network.</td>
<td>• Needs reliable network.</td>
<td>• Needs reliable network.</td>
</tr>
<tr>
<td>• Space issues for institutions.</td>
<td>• No space issue for institutions.</td>
<td>• No space issue for institutions.</td>
</tr>
<tr>
<td>• Less efficient exam management.</td>
<td>• Less efficient exam management.</td>
<td>• Less efficient exam management.</td>
</tr>
<tr>
<td>• Equipment: need computer labs to cater for 2000 at once or BYO.</td>
<td>• Students supply equipment.</td>
<td>• Students supply equipment.</td>
</tr>
<tr>
<td>• More secure: IT control possible, spaces are supervised.</td>
<td>• Not secure: no useful monitoring/essentially unsupervised.</td>
<td>• Not secure: no useful monitoring/essentially unsupervised.</td>
</tr>
<tr>
<td>• Network reliability not an issue.</td>
<td>• Network reliability not an issue.</td>
<td>• Network reliability not an issue.</td>
</tr>
</tbody>
</table>
Quick Guide to OLT e-Exams

**Aim:** to better assess student capabilities using the 'tools of the trade' of the 21\textsuperscript{st} Century. To develop future looking, 'work ready' (and life ready) graduates we need to be able to assess complex, constructed, even 'wicked' tasks.

**e-Exam:** a supervised examination undertaken by a candidate using their own computer. Candidates start their computer from a custom designed USB which contains:

- The operating system and a full suite of office applications.
- The questions and all ancillary material in digital format.
- A reserved location for candidate responses

Works on most Apple and ‘Windows’ laptops.
# e-Exam System Affordances

<table>
<thead>
<tr>
<th>Pertinent Features</th>
<th>Affordances</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 'Whole computer' environment (OS, LMS, applications...) on a stick.</td>
<td>Expanded pedagogical scope over that of a pen or browser window.</td>
</tr>
<tr>
<td>Typed 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 can be added/removed to suit. Electronic collection facilitates analytics, item response analysis...</td>
</tr>
<tr>
<td>No live network required during exam, even for LMS questions.</td>
<td>Robust. Greater control. (network could be used for admin)</td>
</tr>
<tr>
<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>
</tr>
<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>
</tr>
</tbody>
</table>

Bootable ‘live’ USB drive
<table>
<thead>
<tr>
<th>Start</th>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
<th>Phase 4</th>
<th>Phase 5</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Get Ready</strong></td>
<td>Institutional approvals, Research Ethics, Hardware &amp; infrastructure.</td>
<td>Paper equivalent small scale. Basic doc exams only to begin!</td>
<td>Post-paper small to medium. Expanding the media landscape.</td>
<td>Medium to large scale. Adding the power of an LMS.</td>
<td>Whitelisted and logged Internet Network during BYOD exam.</td>
<td>Open but fully logged Internet Network during BYOD exam.</td>
</tr>
<tr>
<td><strong>Type 1: Paper equivalent docs</strong></td>
<td>Students given choice to type. Small numbers typing ~ 20 to 50. Simultaneous, on campus, supervised. No live network. Paper fullback. BYO student laptops, Venue power sockets, spare laptops.</td>
<td>Students given choice to type. Medium numbers ~ 100-200. Simultaneous, on campus, supervised. No live network. Paper fullback. BYO student laptops, Venue power sockets, spare laptops.</td>
<td>Students given choice to type. Large numbers ~ 200+. Simultaneous, on campus, supervised. No live network. Paper fullback. BYO student laptops, Venue power sockets, spare laptops.</td>
<td>Type 2.A: Post paper via word docs linked to media and select online refs</td>
<td>Type 2.B: Post paper via word docs linked to media and select online tools</td>
<td>Type 2.C: Post paper via word docs linked to media, open online access</td>
</tr>
<tr>
<td><strong>Type 2: Post paper (Word docs linked to media)</strong></td>
<td>All students must type. Small to medium ~ 50-200. Simultaneous, on campus, supervised. No live network. Docs linked to multimedia, 3rd party apps, simulation, PDF, etc. BYO student laptops, Venue power sockets, spare laptops.</td>
<td>All students must type. Medium number ~ 100-200. Simultaneous, on campus, supervised. No live network. Docs linked to multimedia, 3rd party apps, simulation, PDF, etc. BYO student laptops, Venue power sockets, spare laptops.</td>
<td>All students must type. Large numbers ~ 200+ Simultaneous, on campus, supervised. Whitelist Internet. Docs linked to multimedia, 3rd party apps, simulation, PDF, etc. Mix BYO student laptops, Venue power sockets and Lab PCs.</td>
<td>Type 3.A: On-board (Moodle)</td>
<td>Type 3.B: On-board LMS, online</td>
<td>Type 3.C: On-b’d LMS, open online</td>
</tr>
<tr>
<td><strong>Type 3: On-board LMS (Moodle)</strong></td>
<td>All students must type. Medium numbers ~ 100-200. Simultaneous, on campus, supervised. No live network. On-board Moodle quiz tool. BYO student laptops, Venue power sockets, spare laptops.</td>
<td>All students must type. Large numbers ~ 200+ Simultaneous, on campus, supervised. Whitelist Internet. On-board Moodle Quiz tool. Mix BYO student laptops, Venue power sockets and Lab PCs.</td>
<td>All students must type. Large numbers ~ 200+ Simultaneous, on campus, supervised. Fully logged open internet. On-board Moodle Quiz tool. Mix BYO student laptops, Venue power and Lab PCs.</td>
<td>Type 4.A: Online/Networked. Mixed Mode, online refs</td>
<td>Type 4.B: Online/Networked. Mixed Mode, online refs</td>
<td>Type 4.C: Online/Networked. Mixed Mode, open online</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refer to handout or this</td>
<td><a href="http://ta.vu/e-exam-roadmap">http://ta.vu/e-exam-roadmap</a></td>
<td></td>
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</tbody>
</table>
Interactive e-assessment design

Separate the interactive tool/object/ artefact from the question and the feedback.

Now apply that to exams too!
Where we are now: Paper Equivalent

**Word doc!** Question types used: short answer/essay, matching, construct a table, label a diagram/image (by filling a table).

**Manual marking.**

Question 2. Match the following host-MOTA names to the description below).

Possible descriptions:

- a) Mauris id mi id orci interdum semper.
- b) Sed eu neque ut est dignissim fringilla.
- c) Vivamus in dolor euismod, luctus libero.
- d) Mauris vehicula eros a viverra pellentesque.
- e) Curabitur eu mi at nibh commodo varius.
- f) Acenae egest orci porta, malesuada loreta.

Please write or type the letter of the descriptions listed above.

<table>
<thead>
<tr>
<th>Answer a to f</th>
<th>Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>f</td>
<td>Paxogen</td>
</tr>
<tr>
<td>a</td>
<td>Sitabasis</td>
</tr>
<tr>
<td>c</td>
<td>Eakesalism</td>
</tr>
</tbody>
</table>

Question 7: Some rationales for punishment are XEZT. What does this mean?

The student types their answer here. In this example, a two row table. The response table row is created and a minimum height cell instead of successive carriage returns to set the box height, the next question will be less likely to be disrupted when students type their responses. The initial size of the box should indicate the desired length of the response. The box will automatically expand when it gets full.

<table>
<thead>
<tr>
<th>Two different examples of flippan faxadism (one per row)</th>
<th>Describe Samuel’s abilities (age 5)</th>
<th>Describe Eamon’s abilities (age 10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type here</td>
<td>Minimum heights set for both rows</td>
<td>More details about setting heights appear later in these examples.</td>
</tr>
</tbody>
</table>
Where we are now: Paper Plus

**Word doc, plus apps.** Question document with links to launch local apps and resources: graphics, Scratch programming tools, presentation slides, PDFs. All on-board the USB stick.

‘IT in Education’ exams : Andrew Fluck, UTAS.

Exam doc

Scratch SDK
The Future: Post-paper exams

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

'Windows' software via WINE. E.g. CAD / 3D modeling, Celestia.

Moodle quiz with media (auto marked).
Current e-Exam v5 Workflow

Set-up: prepare exam learning materials

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

Pre-session:
Student laptop setup & practice.

Exam room use

- Ubuntu Live USB. Libre Office, Moodle etc

Post session: retrieve responses and assessment

- Collect USBs (responses)
- Responses retrieved from USBs.
- Collated e-responses sent to academic.

1. Students enter room.
2. Given USB.
4. Do exam.
5. Return USB.
Prototype using commodity components.

Using an old laptop it can handle 98 USBs at once.

Helper scripts to
• Initial ‘burn’ OS to each USB
• Place exam materials.
• Retrieve exam materials.
• Set-up for the next exam.

User friendly interface planned.
e-Exam: Walk Through
Walk Through

1. **Start with the computer turned OFF.** Then insert USB stick

2. **Hold down ALT then power on.**

   **Apple**
   - Press and release power
   - Hold down
   - Keep holding ALT until you see...

2. **Power on while tapping ‘boot key’ (e.g. F12 or...)**

   **Other/Windows**
   - Tap tap tap...
   - Press and release power
   - Keep tapping until you see...(or similar)

*Win 8: first need to disable secure boot.*
Walk Through

Apple

3. Select a yellow icon. EFI boot or ‘Windows’

Could be either one! So just try.

If you get

Try the other one!

Other/Windows

3. Select USB device.

It might be labeled something else and probably wont be first.
Walk Through

4A. Some system messages may appear, if so just wait.

4B. Exam system starts.

5. Arrive at e-Exam system desktop.
6. Student now types in their student ID number and name* (can be disabled). Click Start Exam. (what happens next dependent upon chosen exam mode)
Walk Through (Document mode)

7. Exam file opens ready to enter exam details and responses.

Note: original file copied and student number prefixed to file name.
Walk Through (Document mode)

8. Read questions and type responses into areas indicated.
Walk Through (post-paper)

8.1 in ‘post-paper’ exams: Make resources available (PDFs, Videos, images) and use specialist software tools to construct responses. Launched via links in the document.
Walk Through


[there is a 2 min ‘auto recovery’ save]
Walk Through

10. Shut down the system. When the system has powered off, hand in the USB Stick.
Start laptop with USB. Instead of launching a document, it opens a web browser. Network connections only possible to pre-defined destination – e.g. UQ Blackboard
e-Exam: LMS Gateway Mode

Use Blackboard test settings for control. Best to have separate Exam server.
e-Exam: on-board LMS Mode

Start laptop with USB. Launches a web browser to login to an on-board Moodle. Moodle account created-on-the-fly. Network connections NOT possible.
Remove non-exam related modules and menus. Large multimedia is possible due on-board storage.
More Questions and Discussion Points

1) How well prepared are:
   – Students to BYOD for exams?
   – Academics for taking on new approaches to exams?
   – Institutions to support BYOD in exam venues?

2) Transitioning to e-Exams via 'paper-replacement' exams appears the most favoured strategy (e.g. first replicating paper exams in an electronic form before moving on to a mix of rich multimedia, linked software apps, and computer marked questions). Do you agree?

3) What kinds of 'post-paper' exams can we envision?

4) How can e-Exams enable curriculum transformation?
Ready?

I hope you are excited about the future - and ready to transform!
e-Exam Project Resources

More information....
Demo set-up Guide,
Student Practice and User Guide

http://transformingexams.com

Demo videos start-up, use and recovery examples.
Apple http://ta.vu/eexam-demo-a
'Wintel' (Dell) http://ta.vu/eexam-demo-d
Contact: mathew.hillier[at]monash.edu
Cite this resource


mathew.hillier@monash.edu

Session feedback survey

http://ta.vu/e-exam-serv
References


220 more at: https://www.zotero.org/groups/e-assessment/items/tag/e-exam