

e-Exams: UQ Trial Outcomes S1 2014



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Get the demo and user guides

<http://transformingexams.com>



Acknowledgement

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Part 1: About e-Exams

Targeting...

- Supervised
- High stakes
- On campus
- Large scale



(image credit: Dr Fluck UTAS)

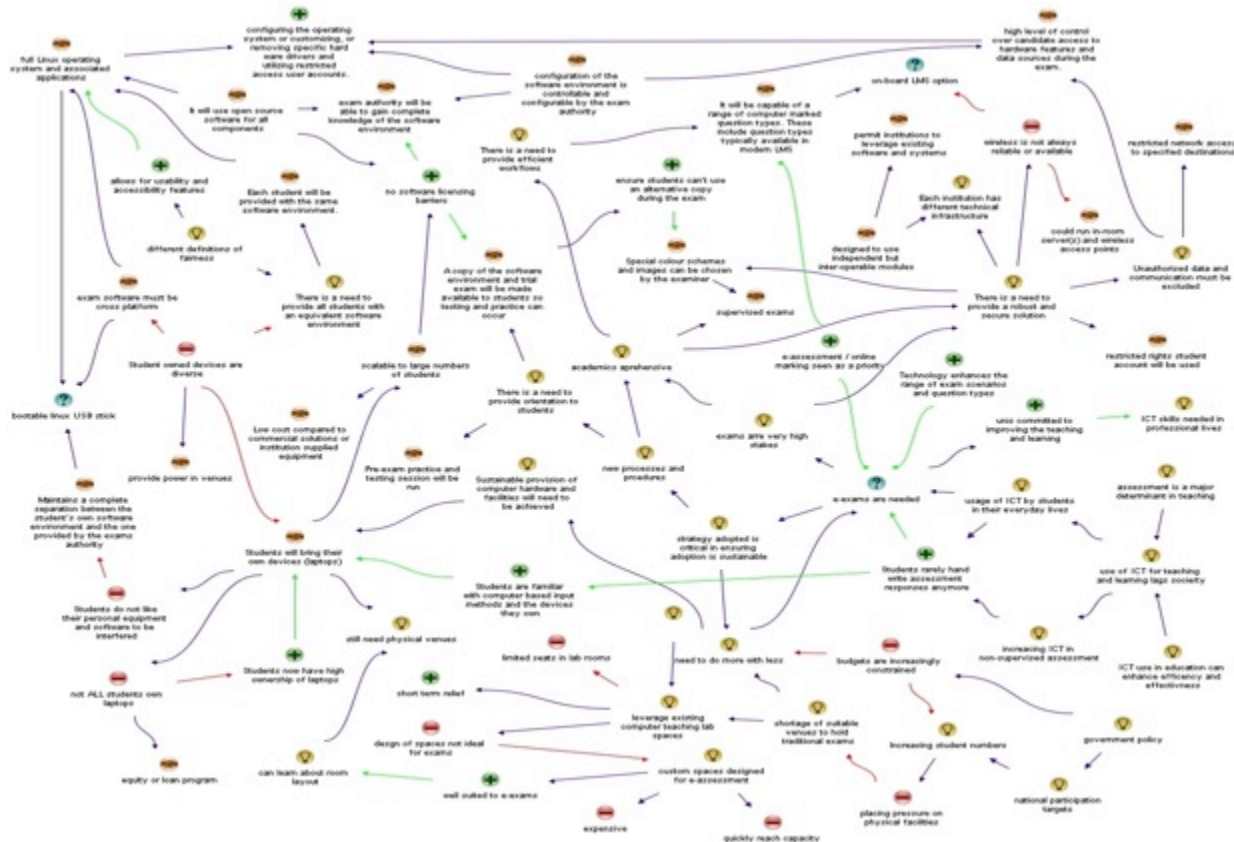
*What we are **not** specifically addressing here is off campus, online only, distance education, cross institutional students – there are some existing e-solutions to address these needs.*

Why e-Exams?

Rationale

Hillier, Mathew and Fluck, Andrew (2013). Arguing again for e-exams in high stakes examinations. In: H. Carter, M. Gosper and J. Hedberg, Electric Dreams. Proceedings of the 30th ASCILITE Conference, Sydney, Australia, (385-396). 1-4 December. <http://www.ascilite.org.au/conferences/sydney13/program/papers/Hillier.pdf>

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



So?

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

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



Bootable
'live'
USB
drive



Current e-Exam System v5 Demo

Four-in-one demo system (desktop shown below)...

1. Word document based exams (paper equivalent / into use **S1 2014**)
2. Word doc + multimedia + 3rd party software tools (coming S2 2014)
3. LMS (Moodle) based exams (computer marked questions - TBA)
4. Remote (serves as a restricted gateway) to networked LMS.



Word doc exams

On-board LMs exams

UQ S1 2014 Trial: Paper equivalent exams

First stage: Paper 'equivalent' via on-board word processor.
This was used for Semester 1 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!)

The image shows a sequence of steps for starting an e-exam. It starts with a laptop and a USB key. An arrow points to a screenshot of the 'e-Exam Starter' application window. The window has input fields for 'Student ID' (12345678), 'First Name(s)' (Joe), and 'Surname' (Bloggs), along with a 'Start Exam' button. A second arrow points down to a screenshot of a LibreOffice Writer document. The document is the exam cover page for 'THE UNIVERSITY OF QUEENSLAND AUSTRALIA'. It includes a table for 'All students to complete' with fields for Venue, Seat, Student Number, Family Name, First Name, and USB number. Below the table, it says 'School of Life, The Universe and Everything EXAMINATION Semester One Mid Semester Examinations, 2014 PRAC0000 Practice Course'. At the bottom, there are sections for 'Examination Duration', 'Exam Conditions', and 'For Examiner Use Only' with a table for marking questions.

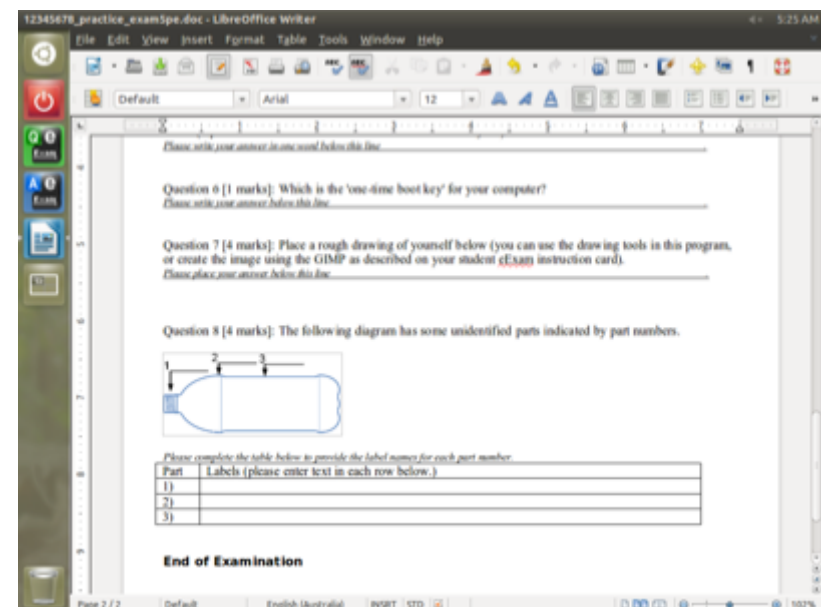
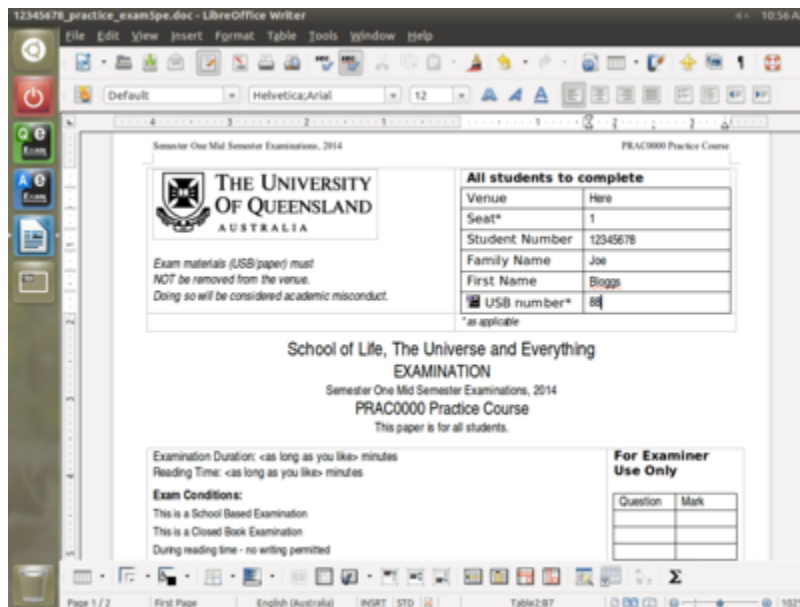
All students to complete	
Venue	Here
Seat*	1
Student Number	12345678
Family Name	Joe
First Name	Bloggs
USB number*	88

For Examiner Use Only	
Question	Mark

UQ S1 2014 Trial: Paper equivalent exams

UQ trials, Semester 1 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!



UQ S1 2014 Trial: Paper equivalent exams

Responding to questions in-line in the word processor
(note – the system keeps a read-only backup of the questions!)

Type where indicated....

Question 1 [1 marks]: What is your full name?
Please write your answer in a couple of words below this line - place the cursor below this line and start typing!
Joe Bloggs Type below the line (or in a box)

Simple drawing tools...

Question 2 [1 marks]: What is the Brand/make/manufacturer of your computer?
Please write your answer in a couple of words below this line
Dell

Label a diagram...

Question 7 [4 marks]: Place a rough drawing of yourself below (you can use the drawing tools in this program, or create the image using the GIMP as described on your student eExam instruction card).
Please place your answer below this line

content facej

Copy & Paste

Draw in GIMP

Question 8 [4 marks]: The following diagram has some unidentified parts indicated by part numbers.

Fill in table rows...
Or type 'x' for MCQs

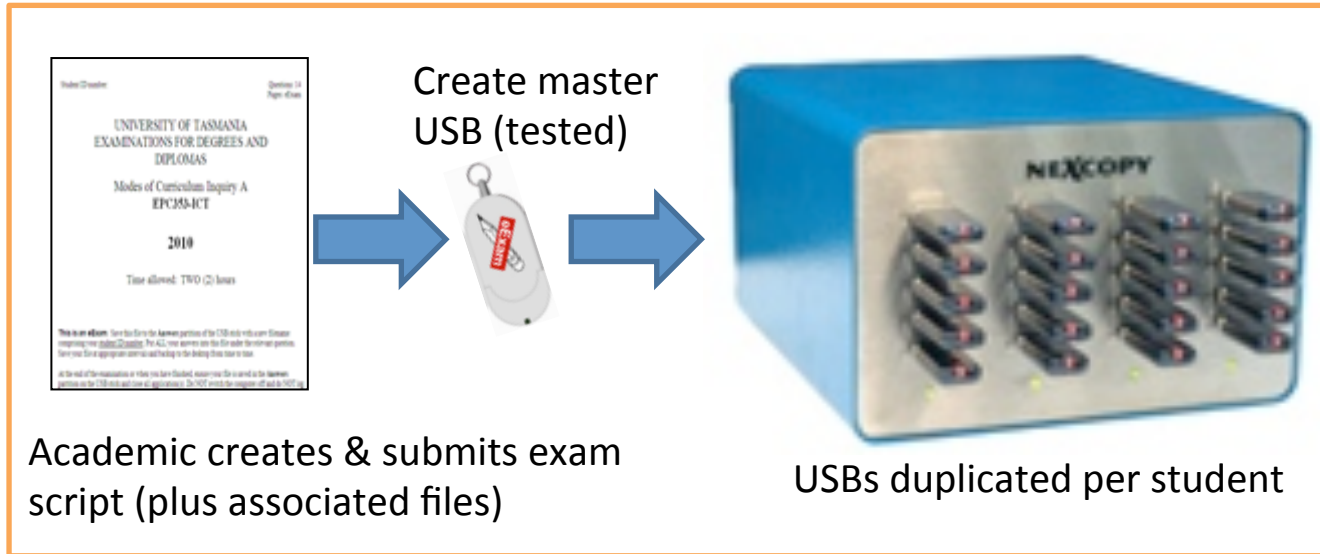
Please complete the table below to provide the label names for each part number.

Part	Labels (please enter text in each row below.)
1)	top
2)	widest
3)	label

Note: Drawing tool was available but not used.

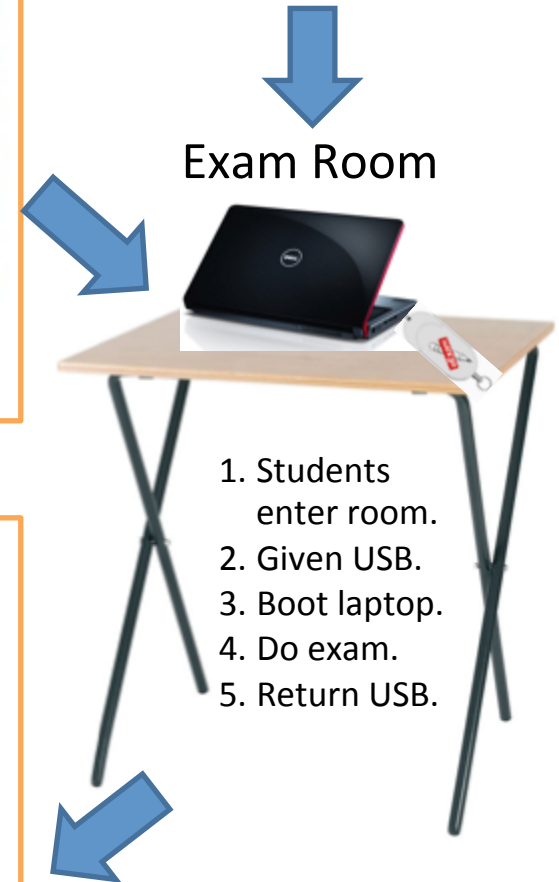
The Current Process – how it works

Prep

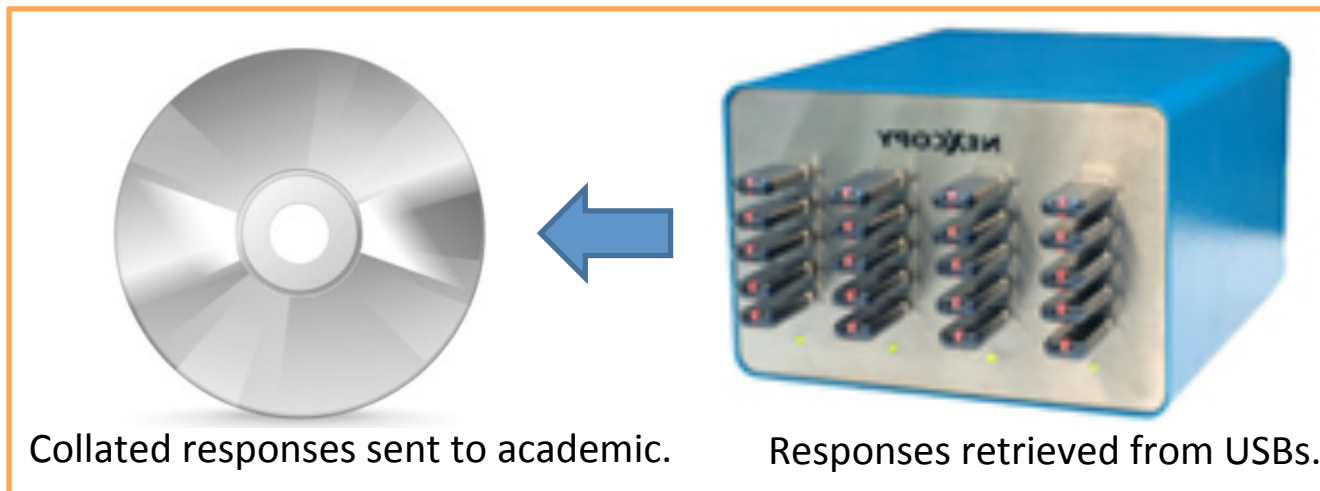


Students pre-exam:
Practice/laptop testing/
setup sessions.

Exam Room



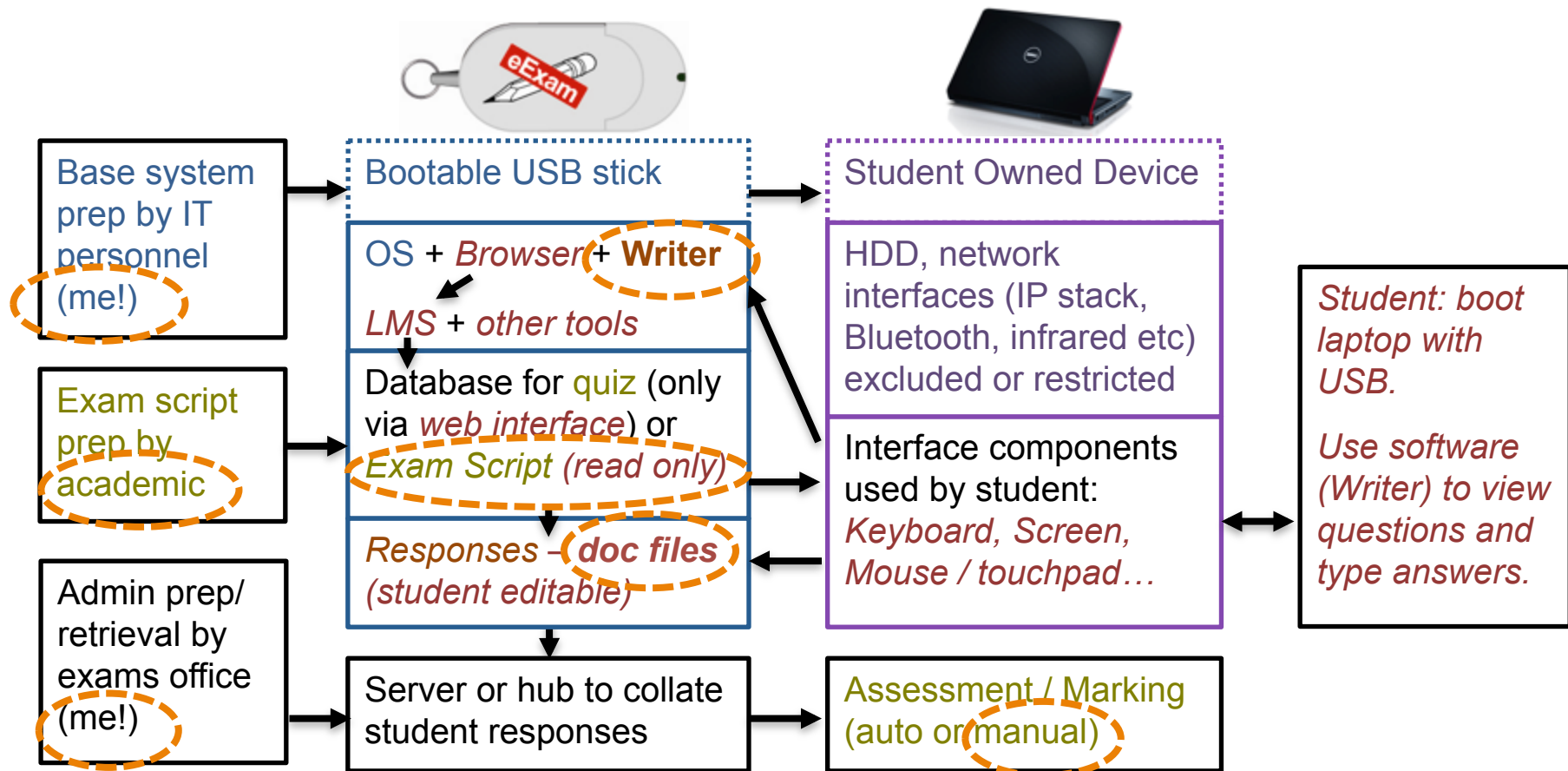
Post Exam



(credit: Dr Fluck UTAS)

Architecture of e-Exam System for BYOD

Modular architecture so academics / institutions can choose the features and mode of operation that suit them... **For 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]

The next phase: Post-paper exams with multimedia

UQ S2 2014 TBA: Post-paper exams via word processor (used at UTAS)

Include links to on-board media, PDFs and other software tools.

The image shows a screenshot of a word processor exam interface. The main window displays a list of exam questions. A video player window is overlaid on the right side of the screen, showing a video titled "Genomics Digital Lab.ogg". The video content includes a "PLANT PROPERTIES" panel with a tree icon and a "WHERE THE CHLOROPLAST" panel with a landscape scene. A black arrow points from the video player to the exam questions. The video player interface includes a progress bar, play/pause buttons, and a volume icon. The status bar at the bottom of the video player shows "Playing 0:27 / 1:18".

Movie Player

File Edit View Insert Format Table Tools Window Help

Default Times New Roman

5. Please describe the picture shown below.

Please write your answer below this line

6. Click on [this link](#) or open the file in your Materials folder. Please write your answer below this line

7. Place a drawing of yourself below (you can use the GIMP as described on your student cEX). Please put your answer below this line

8. View the video file by clicking on [this link](#) in your Materials folder.

a) Could you see the video playing on your screen?

Page 2 / 3

Default English (Australia)

Genomics Digital Lab.ogg

GENOMICS DIGITAL LAB

PLANT PROPERTIES

CHLOROPLAST

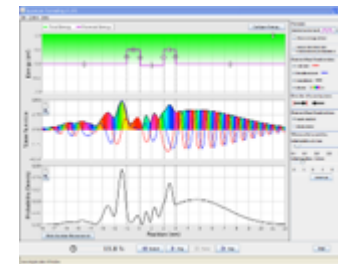
WHERE THE CHLOROPLAST

Time: 0:27 / 1:18

Playing

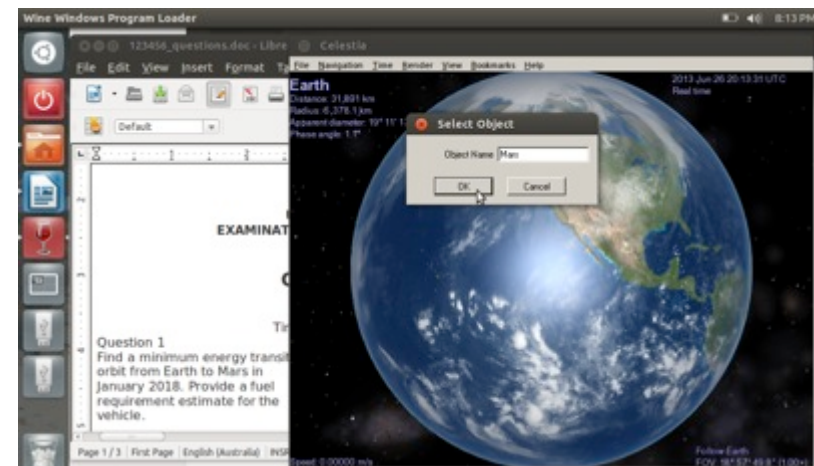
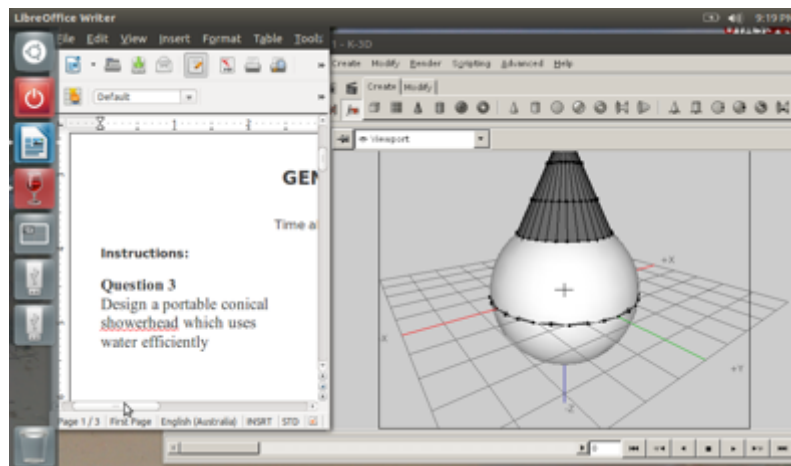
The next phase: can include software tools

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



More examples <http://www.transformingassessment.com/moodle/course/view.php?id=38>

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 screenshot shows the 'e-Exam' interface in a browser. The top navigation bar includes 'Home', 'My courses', 'e-Exam', 'e-Exam Demo', and 'Start e-Exam Demo'. A 'QUIZ NAVIGATION' panel on the left shows the user 'John Smith' and a grid of question numbers (1-14). The main content area displays three questions:

- Information:** All questions in this demonstration exam, except for number 7 which an essay question, are computer marked. This demonstration displays all questions on one page, permits multiple attempts and provides feedback on correct and incorrect responses after the completion of the exam. These settings can be changed as needed.
- Question 1:** Moodle is the most popular LMS in the world today. Select one: True, False.
- Question 2:** What do you call a question format in which students must uniquely associate a set of prompts with a set of options? Answer:

The screenshot shows a close-up of two questions in the 'e-Exam' interface:

- Audio Question:** Listen to the audio and choose the appropriate response - what did you hear? An audio player shows 0:25. Select one: a. The sound of an elephant, b. The audio didnt work for me, c. The sound of a bird.
- Video Question:** Can you play the video and hear the sound? A video player shows a 3D scene with a large yellow sphere and other objects. Select one: a. I get nothing, b. I can play the video and hear the sound, c. I can play it, but can not hear any sound.

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'.

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



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

1 Click on the link for Question 1 on the external web page. Use the emission and absorption spectroscopy tool below to determine the element corresponding to the colour orange-red in the gas discharge tube.

Marks: 1

Choose one answer.

- a. sodium
- b. copper
- c. neon
- d. barium

Module Item Added Controller

This course is listed for learning activities in Second Life. This page is provided to allow students to check whether the Second Life interface is currently enabled, and for instructors to configure the interface.

SLOODLE Controller for Chemistry

Status: Enabled

Available Object Configuration

You can choose to configure some SLOODLE objects with a selected instead of using the console with forced authentication. It is best to use, as it involves the use of a single form prepared for all objects, but it makes it quicker and easier to not pre-configure objects from your inventory.

Select which object you would like to create a configuration record for from the list below. If multiple versions are available, then they are shown in the brackets -- only use the older versions if the main version does not work.

- Choice
- LogiZone
- MapiZone
- Password Reset
- Presenter
- ProneMap
- Quiz Chair
- Quiz Item On
- Registration Environment Booth
- SLOODLE Set
- Second Life Tracker
- Smooth API HQ
- Smooth Award System
- Waiting Machine
- WebInterface

Showing graded and ungraded attempts for each user. The one attempt for each user that is graded is highlighted. The grading method for this quiz is **highest grade**.

Username	Attempted on	Completed on	Time taken	Score	MCQ	MC	MCQ	MC
Geoffrey Charesworth	2 May 2010, 08:08 PM	9 November 2010, 09:00 PM	128 days 3 hours	2.0	0.0	0.0	0.0	0.0
Geoffrey Charesworth	20 June 2010, 02:02 PM	9 November 2010, 09:00 PM	128 days 8 hours	0	0.0	0.0	0.0	0.0
Geoffrey Charesworth	4 July 2010, 02:48 PM	9 November 2010, 09:00 PM	122 days 7 hours	0	0.0	0.0	0.0	0.0
Geoffrey Charesworth	4 July 2010, 02:22 PM	9 November 2010, 09:00 PM	122 days 7 hours	0	0.0	0.0	0.0	0.0
Geoffrey Charesworth	4 July 2010, 04:14 PM	9 November 2010, 09:00 PM	122 days 8 hours	0	0.0	0.0	0.0	0.0
Geoffrey Charesworth	4 July 2010, 02:41 PM	9 November 2010, 09:00 PM	128 days 7 hours	0.0	0.0	0.0	0.0	0.0
Geoffrey Charesworth	4 July 2010, 02:04 PM	9 November 2010, 09:00 PM	128 days 7 hours	0	0.0	0.0	0.0	0.0
Geoffrey Charesworth	4 July 2010, 02:28 PM	9 November 2010, 09:00 PM	128 days 8 hours	0	0.0	0.0	0.0	0.0
Geoffrey Charesworth	4 July 2010, 02:02 PM	9 November 2010, 09:00 PM	128 days 8 hours	0	0.0	0.0	0.0	0.0
Geoffrey Charesworth	4 July 2010, 02:02 PM	9 November 2010, 09:00 PM	128 days 8 hours	0	0.0	0.0	0.0	0.0
Geoffrey Charesworth	4 July 2010, 07:12 PM	9 November 2010, 09:00 PM	128 days 11 hours	0	0.0	0.0	0.0	0.0
Geoffrey Charesworth	4 July 2010, 02:08 PM	9 November 2010, 09:00 PM	128 days 8 hours	0	0.0	0.0	0.0	0.0
Geoffrey Charesworth	2 June 2010, 02:47 PM	9 November 2010, 09:00 PM	128 days 4 hours	0.0	0.0	0.0	0.0	0.0
Geoffrey Charesworth	10 June 2010, 08:08 PM	9 November 2010, 09:00 PM	142 days 4 hours	0	0.0	0.0	0.0	0.0
Geoffrey Charesworth	7 May 2010, 02:48 PM	7 May 2010, 02:48 PM	31 secs	0	0.0	0.0	0.0	0.0
Geoffrey Charesworth	20 June 2010, 02:04 PM	20 June 2010, 02:04 PM	24 secs	0	0.0	0.0	0.0	0.0
Overall average				0.00	0.00	0.00	0.00	0.00

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!*

The image displays two screenshots of the Blackboard Learn interface. The top screenshot shows the 'Preview Test: Example test - e-exam mode' page. The page header includes 'THE UNIVERSITY OF QUEENSLAND AUSTRALIA' and 'eLearning@UQ'. The main content area contains a table with the following details:

Description	Example test to try marking (Normally the description of the test for students would appear here)
Instructions	Normally the instructions for students would appear here
Timed Test	This Test has the time limit of 1 hour. You are notified when time expires, and you may continue or submit. Warnings appear when half the time, 5 minutes, 1 minute and 30 seconds remain <i>[The timer does not appear when previewing this Test]</i>
Multiple Attempts	Not allowed. This Test can only be taken once.
Force Completion	Once started, this Test must be completed in one sitting.

Below the table, there is a section for 'Question Completion Status:' and a warning: 'Moving to another question will save this response.' The current question is 'Question 1' with a value of '10 points' and a 'Save' button. The question text is 'What is two times twenty-one?' and the input field contains the answer '42'.

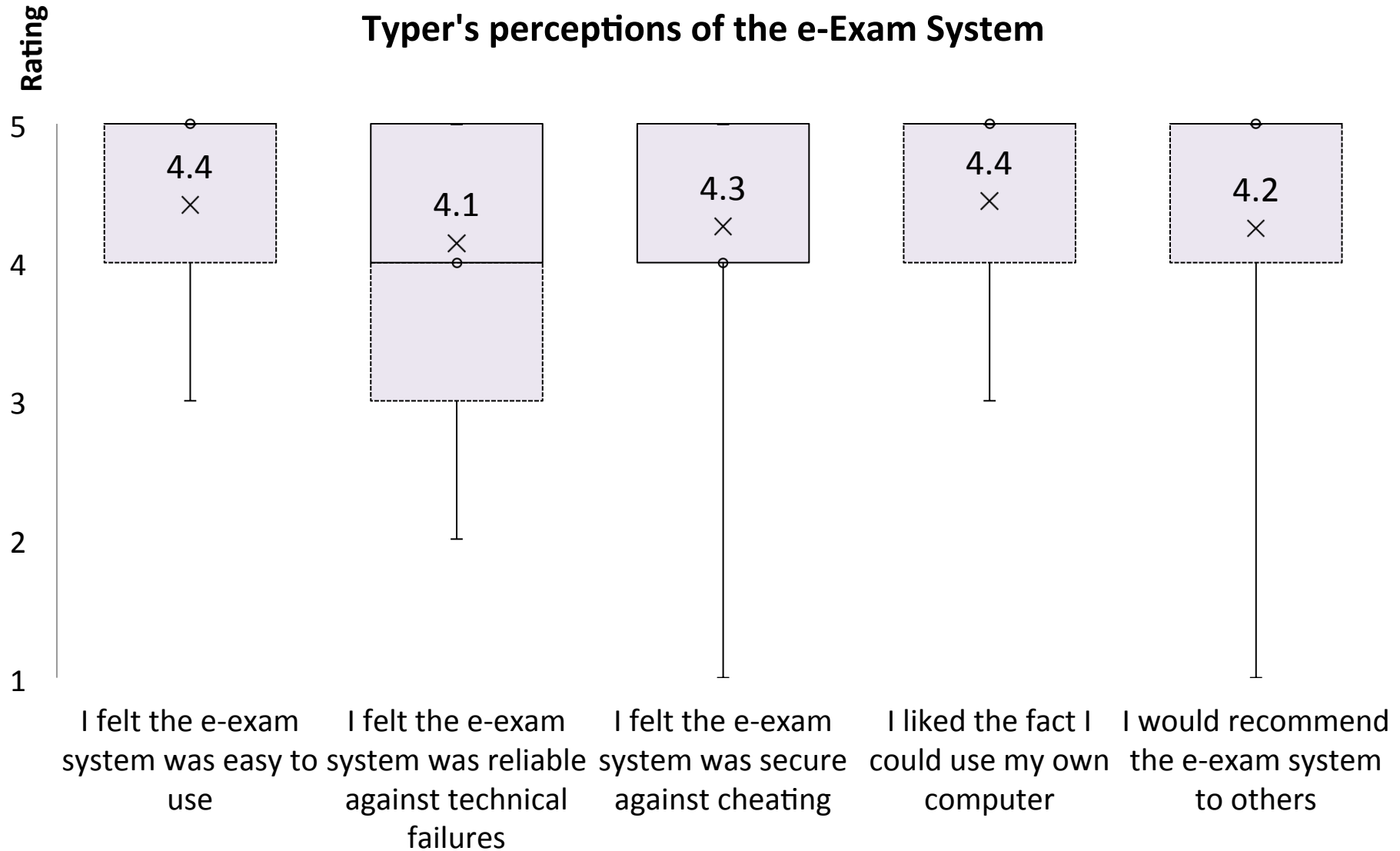
The bottom screenshot shows the 'Learn.UQ' login page. It features the University of Queensland logo and the text 'Learn.UQ'. There are input fields for 'USERNAME:' and 'PASSWORD:', followed by a 'Login' button. A small footer note reads: 'Staff and students: To log into Blackboard use your UQ username/Student ID and password. If you don't know your password contact the ITS Helpdesk on 07 538 5600 or 1300 738 002 (Australia Only), or by email: Blackboard@its.uq.edu.au

Part 2: UQ e-Exam Trial Outcomes S1 2014

UQ Trials S1 2014 Data collected:

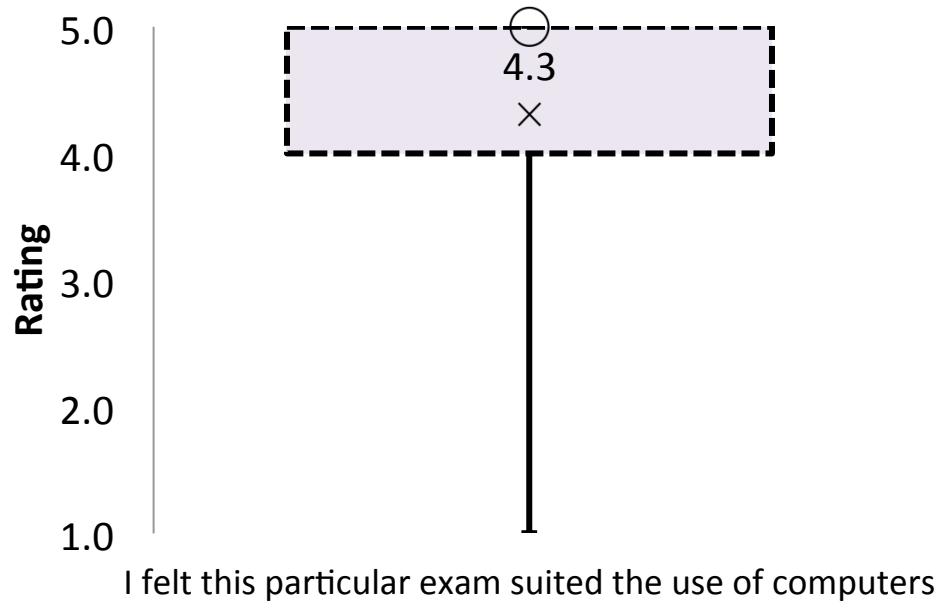
- Via pre-exam short survey (*not shown here*).
 - Conducted at the pre-exam practice setup sessions.
 - Covered: technical compatibility, hardware spec lists, preliminary impressions.
- Via post-exam extended survey (*main findings follow*)
 - Conducted at the conclusion of the exam (in the room).
 - Covered: exam experience, reaction to exam session conditions, e-exam system impressions, exam writing strategies and production, general non-exam writing strategies.

Reported by those that used the system (via post-exam survey)



Likert scale/rating: 1 = strongly disagree to 5 = strongly agree [N = 58]

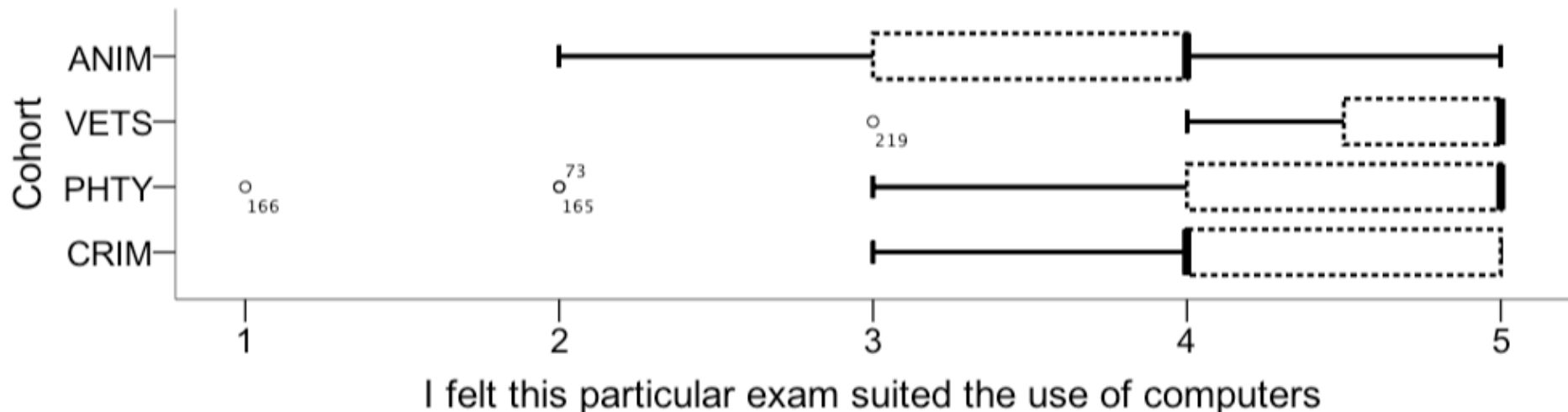
Did typers think the exam suited the use of computers?



Those that typed the exam. All four cohorts combined (VETS, CRIM, PHTY & ANIM).
Likert Scale: 5 = Strongly Agree, 1 = Strongly Disagree
Boxplot whiskers are min and max.
An X denotes the mean 4.31 (value shown) and a small **circle** indicates the median. N = 58.

Largely that was a 'yes'.

Those that typed the exam by cohort:

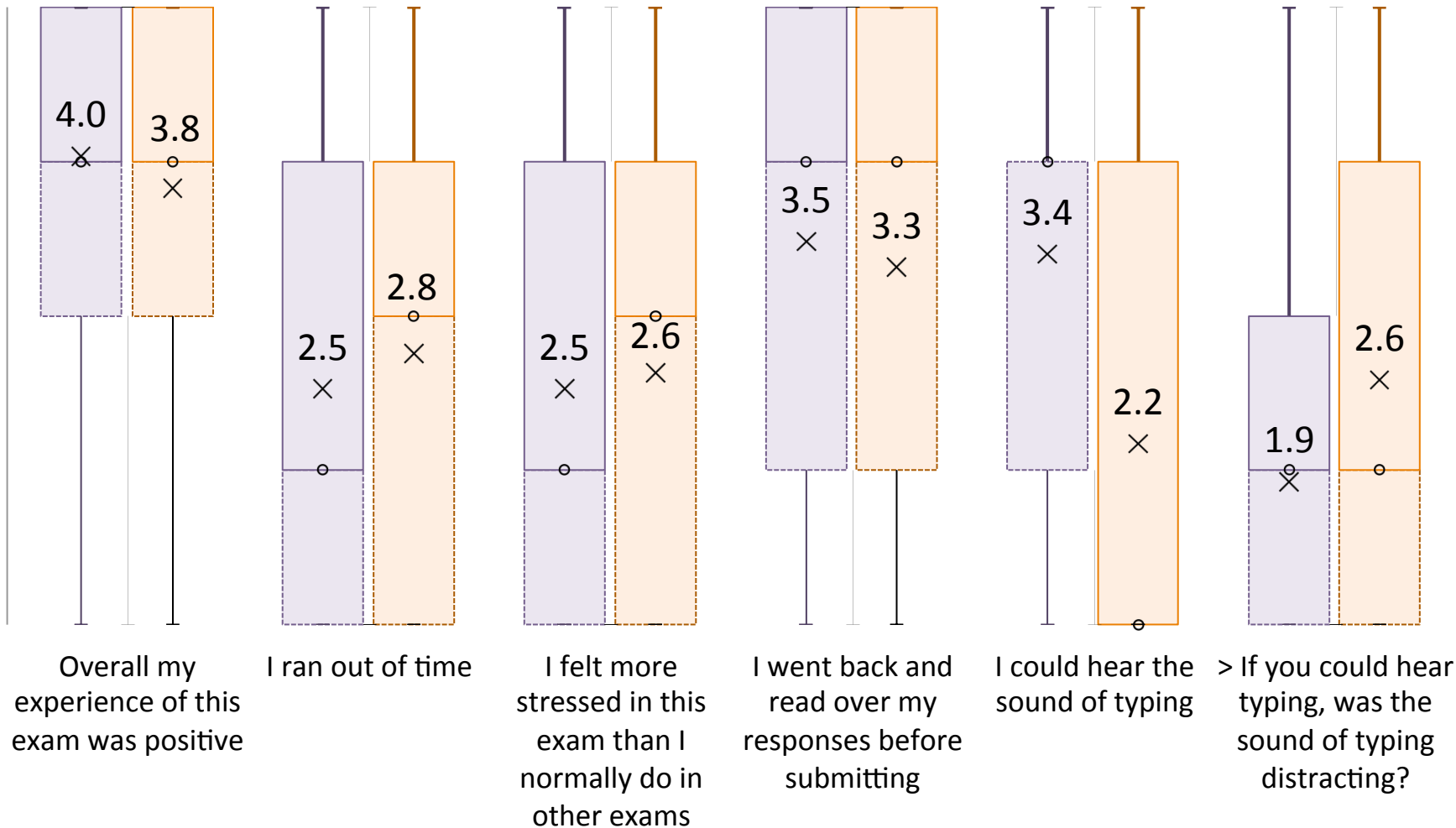


Student reaction to exam conditions

Typers (left) and Hand writers (right)

Rating

5
4
3
2
1

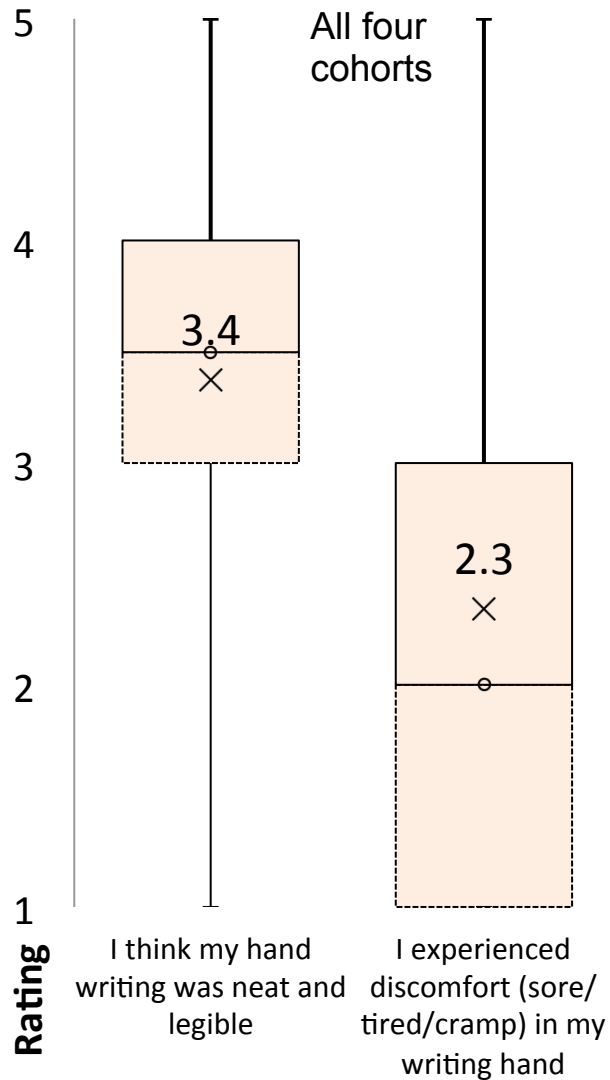


Likert scale: 5 = strongly agree, 1 = strongly disagree. Mean shown as x with figure and median shown as a circle o.

T-test to compare means (cross X and figures shown above) of typers and hand writers.

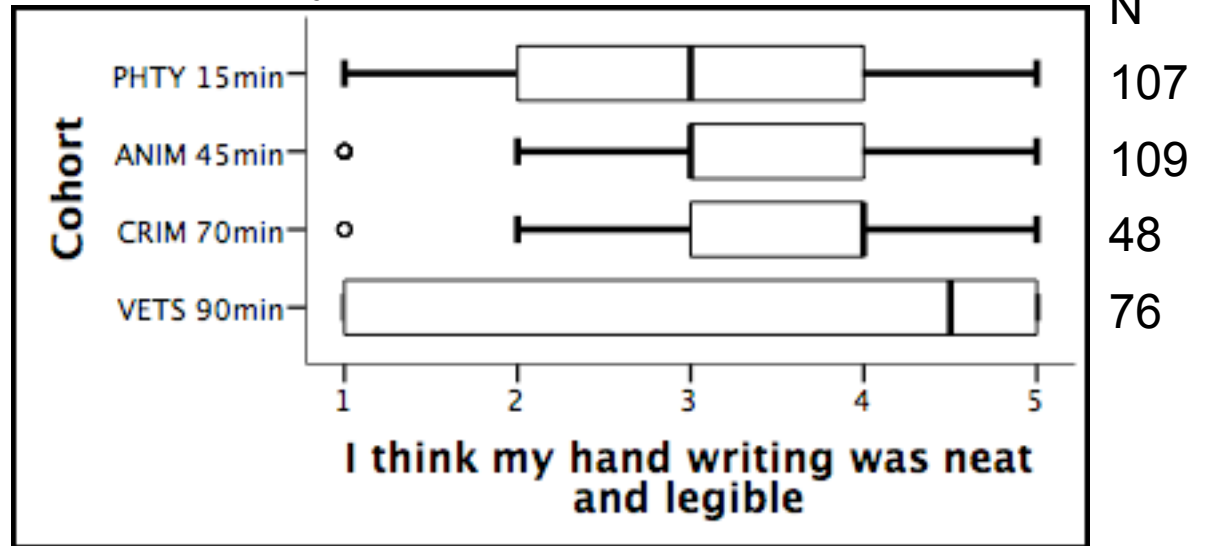
p .166 .288 .582 .438 .000 .001

Hand writing in the exam



Are some students over estimating the neatness of their hand writing?!

Breakdown by cohort

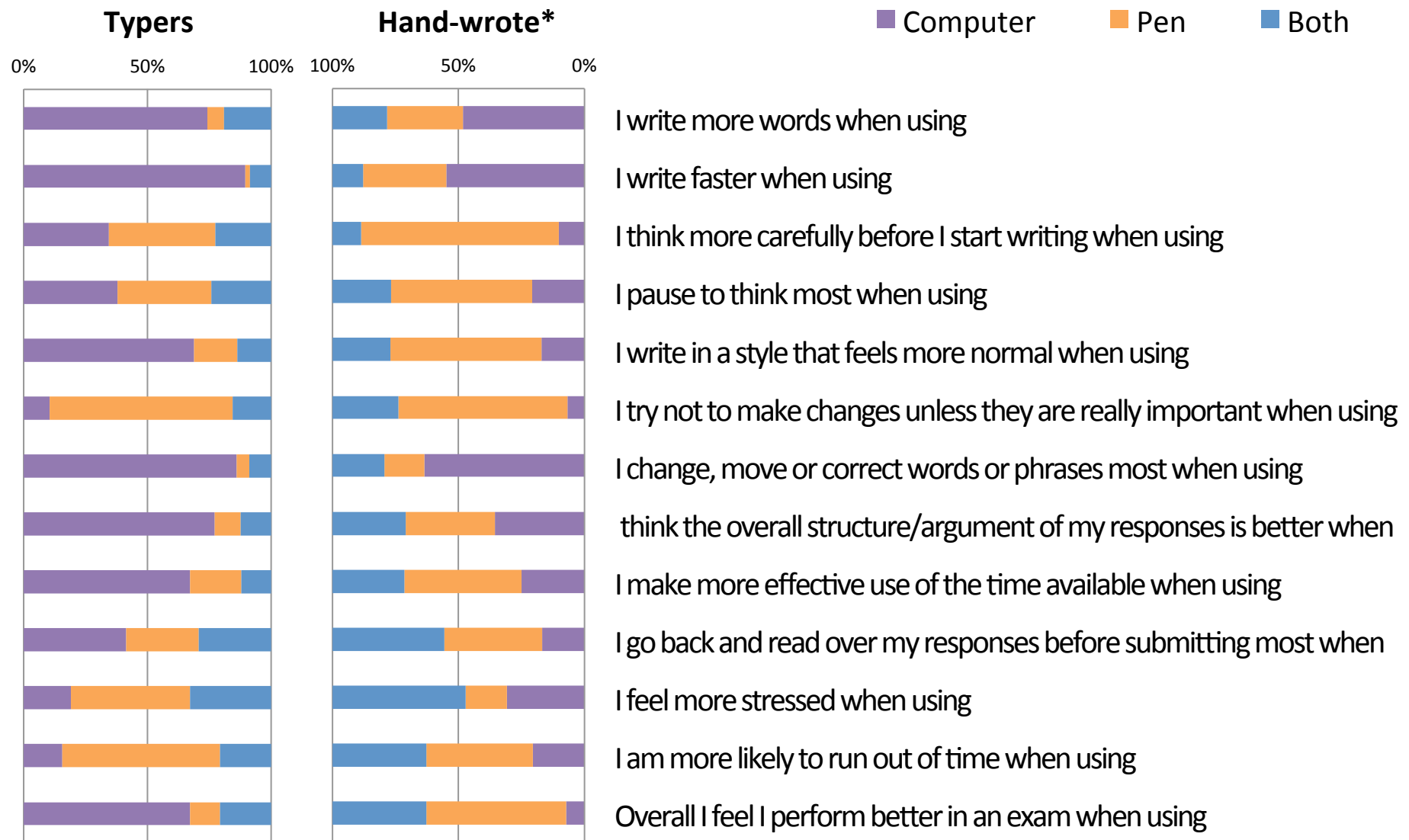


Discomfort from using a pen increased with exam duration (below).



* Note 20% response rate by VETS for this item. All others near 100%

Student response to general exam conditions when using computer versus pen (responses by those who typed on the left & those that hand-wrote* on the right)

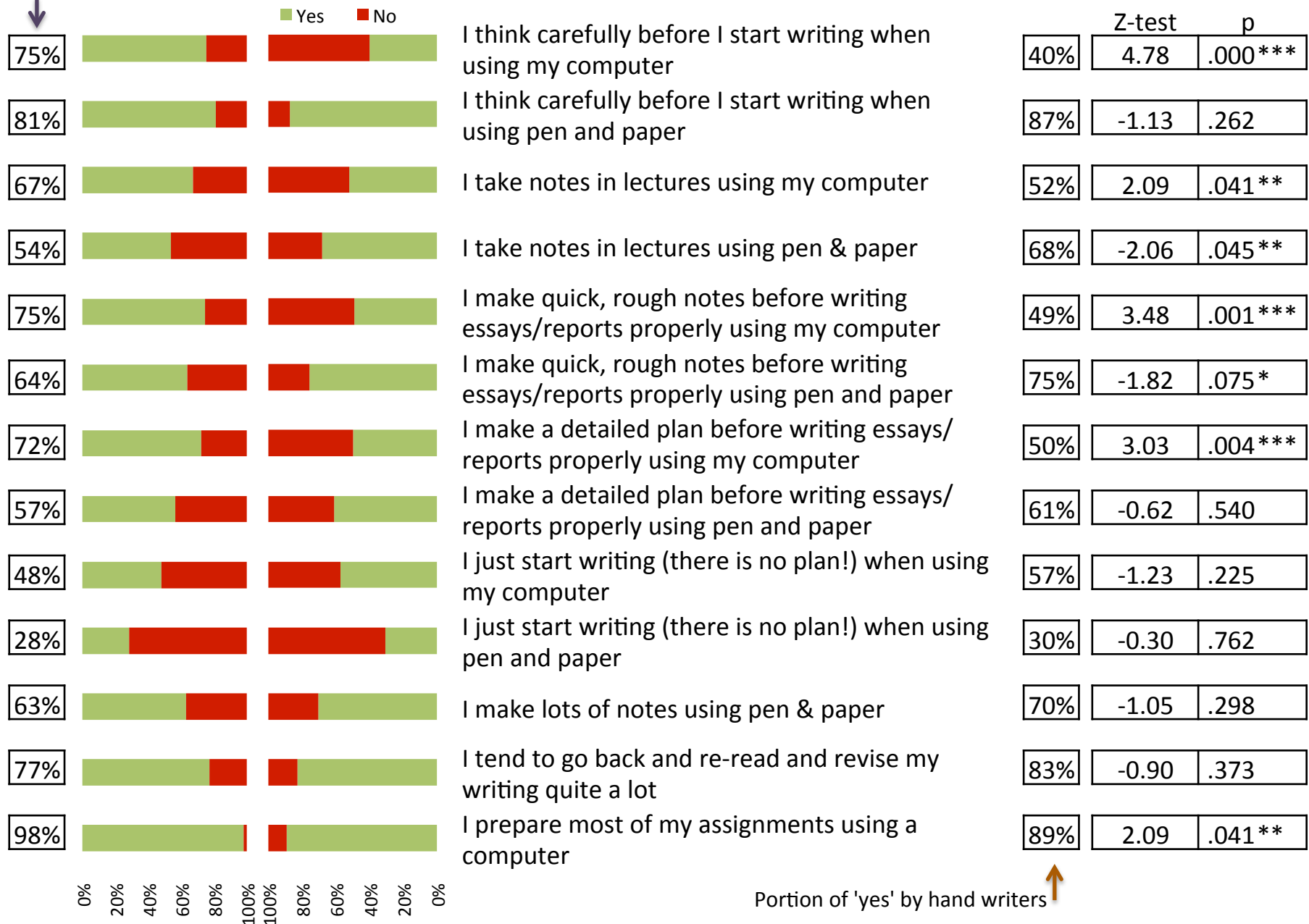


* Note - Many of those that hand-wrote their exam had no prior experience of using a computer for an exam so the results presented here are largely speculative on their part. However, it is reasonable to assume that they drew on their general use of computers.

Writing strategies under non-exam conditions – general writing habits

Responses by Typers (left) and Hand writers (right)

Portion of 'yes' by typers



0% 20% 40% 60% 80% 100% 100% 80% 60% 40% 20% 0%

Portion of 'yes' by hand writers

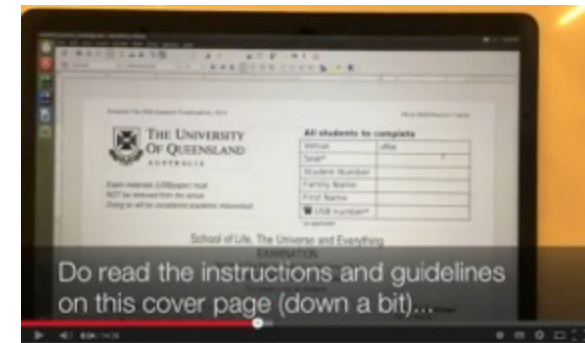
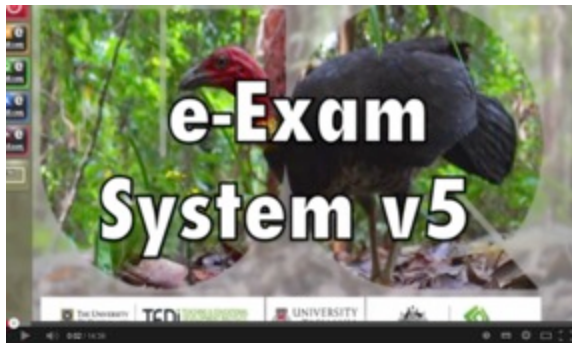
e-Exam System Guides and Videos

More information....

Demo set-up Guide,

Student Practice and User Guide

<http://transformingexams.com/guides.html>



Demo videos start-up, use and recovery examples.

Apple <http://bit.ly/eexam-demo-vid-a>

'Wintel' (Dell) <http://bit.ly/eexam-demo-vid-d>

More ...

<http://transformingexams.com>

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