TRANSFORMINGEXAMS.COM

A Scalable Examination Platform for BYOD Invigilated Assessment

Walkthrough:

BYOD e-Exams with Robust Moodle online

Mathew Hillier, University of New South Wales.

Transforming Exams

Updated 31 May 2019

Adoption roadmap: towards authentic e-assessment

Get Ready	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Institutional approvals, research ethics, hardware and infrastructure	Paper equivalent small scale. Basic doc exams to begin!	Post-paper small to medium. Expanding the app and media landscape.	Medium to large scale. Adding the power of an LMS.	Whitelisted and logged Internet Network BYOD exam.	Open but fully logged Internet Network mixed mode BYOD exam.
	Crawling	**Walking**	**Running**	**Jumping**	**Flying!**

http://ta.vu/e-exam-roadmap
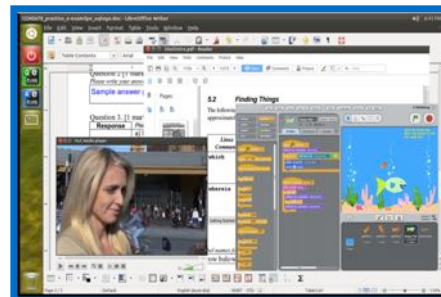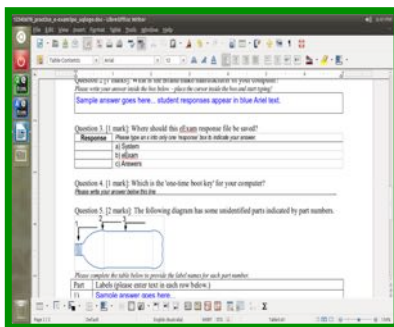
Extension work:
An offline e-learning platform
see **moleap.org**
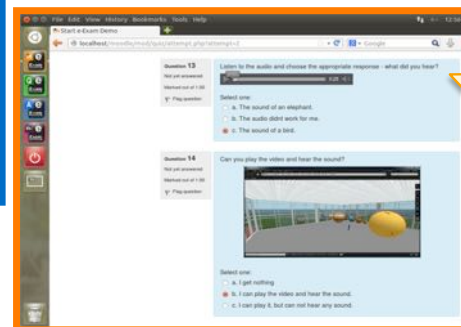
We are here!
Moodle resistant to network outages.

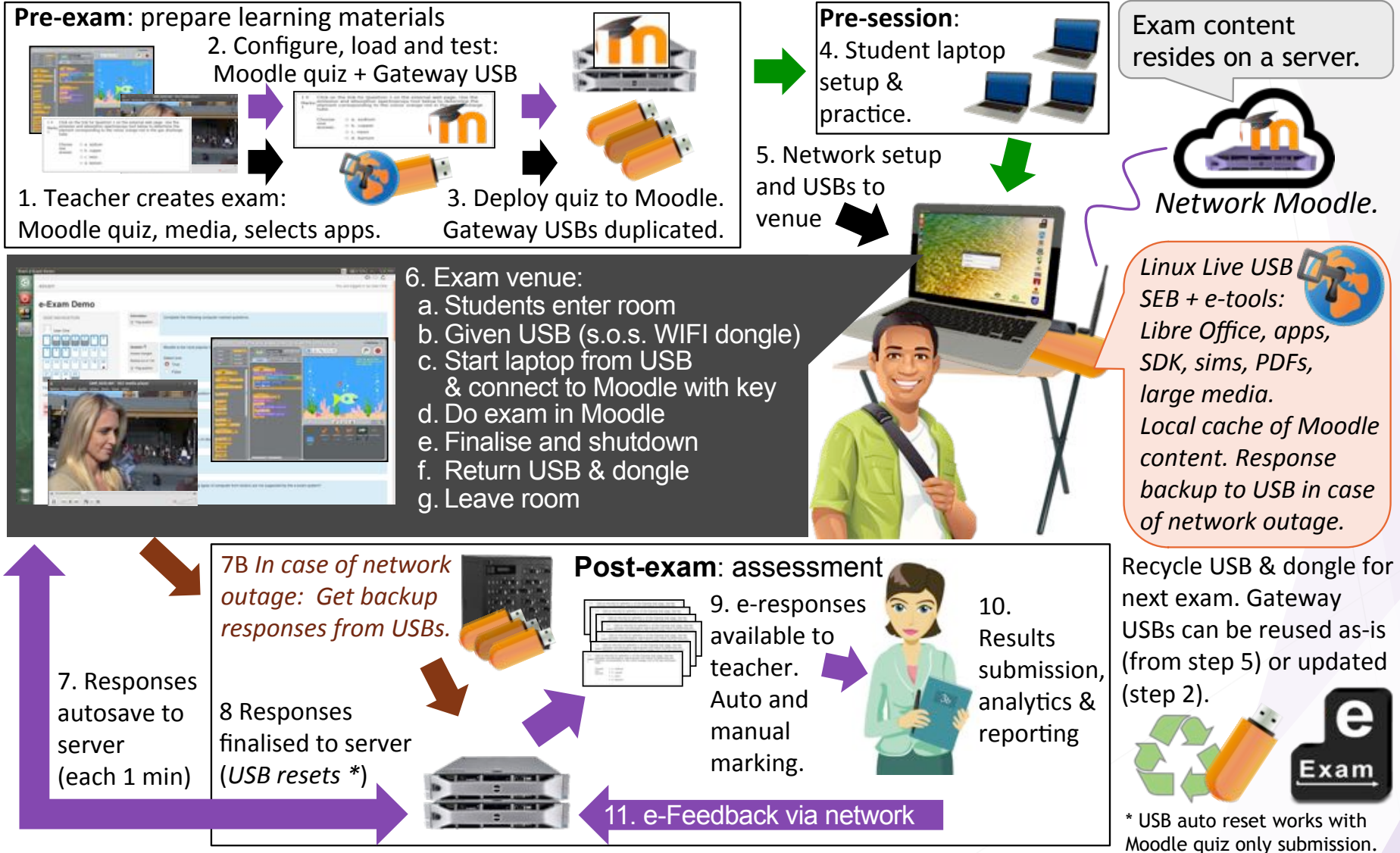# e-Exam types now in use

The e-Exam platform features in use now:

1: Paper-equivalent doc or spreadsheet 'form' based exam

2: Post-paper word doc centric exam (multimedia, programming, spreadsheets, math tools)

3: Moodle based exam (client/server - robust, 'offline')

Features under development ~ 2019+

4: White-listed online exam with logging (half done!)

5: Open online exam with logging, key logging, screen recording, cam capture... (half done!)

BYOD e-Exam process: robust online Moodle (Phase 3)

Pre-exam: prepare learning materials

2. Configure, load and test:
Moodle quiz + Gateway USB

1. Teacher creates exam:
Moodle quiz, media, selects apps.

3. Deploy quiz to Moodle.
Gateway USBs duplicated.

Pre-session:
4. Student laptop setup & practice.

Exam content resides on a server.

Network Moodle.

5. Network setup and USBs to venue

6. Exam venue:
   a. Students enter room
   b. Given USB (s.o.s. WIFI dongle)
   c. Start laptop from USB
      & connect to Moodle with key
   d. Do exam in Moodle
   e. Finalise and shutdown
   f. Return USB & dongle
   g. Leave room

Linux Live USB SEB + e-tools: Libre Office, apps, SDK, sims, PDFs, large media. Local cache of Moodle content. Response backup to USB in case of network outage.

7B *In case of network outage: Get backup responses from USBs.*

Post-exam: assessment

9. e-responses available to teacher. Auto and manual marking.

10. Results submission, analytics & reporting

Recycle USB & dongle for next exam. Gateway USBs can be reused as-is (from step 5) or updated (step 2).

7. Responses autosave to server (each 1 min)

8 Responses finalised to server (*USB resets **)

11. e-Feedback via network

* USB auto reset works with Moodle quiz only submission.

Academics / Teachers (Preparation)

Online exam:

1) Create Quiz in Moodle
2) Apply four settings*
for added security and
reliability.

3) Configure and deploy
e-Exam USBs.

* Moodle requires modified
plugins and configuration.
This must be paired with Safe
Exam Browser e-Exam OS edition!

Extra restrictions on attempts

Require password ⑦	·············· ☐ Unmask
Require network address* ⑦	
Enforced delay between 1st and 2nd attempts* ⑦	0 minutes ▾ ☐ Enable
Enforced delay between later attempts* ⑦	0 minutes ▾ ☐ Enable
Browser security* ⑦	Require the use of Safe Exam Browser ▾
Experimental fault-tolerant mode* ⑦	Yes ▾
Allowed browser keys* ⑦	

Show less...

Pass given to students in exam room only

Can only use SEB

Protect network outage

Unique SEB key.

Try it: Start laptop from e-Exam USB

E.g. To boot to USB (on Apple)*

1. Power is off
2. Insert USB
3. Power ON & hold DOWN alt/option.
   Keep holding then..
4. Choose the yellow EFI icon.
5. System will auto join EduRoam WiFi (or type username and pass)
6. SEB will open at the demo Moodle Logon page:

user1, user2… user70
Passw0rd!

* *Windows laptops also work* – e.g. At step 3: Dell = F12. Windows 10 may require shift restart. We provide a 'Quick start' sheet to students… (see transformingexams.com)

Start up – upon reaching the e-Exam OS desktop

Select LOTE (if applicable)

Connect to WiFi network (or system can automatically connect)
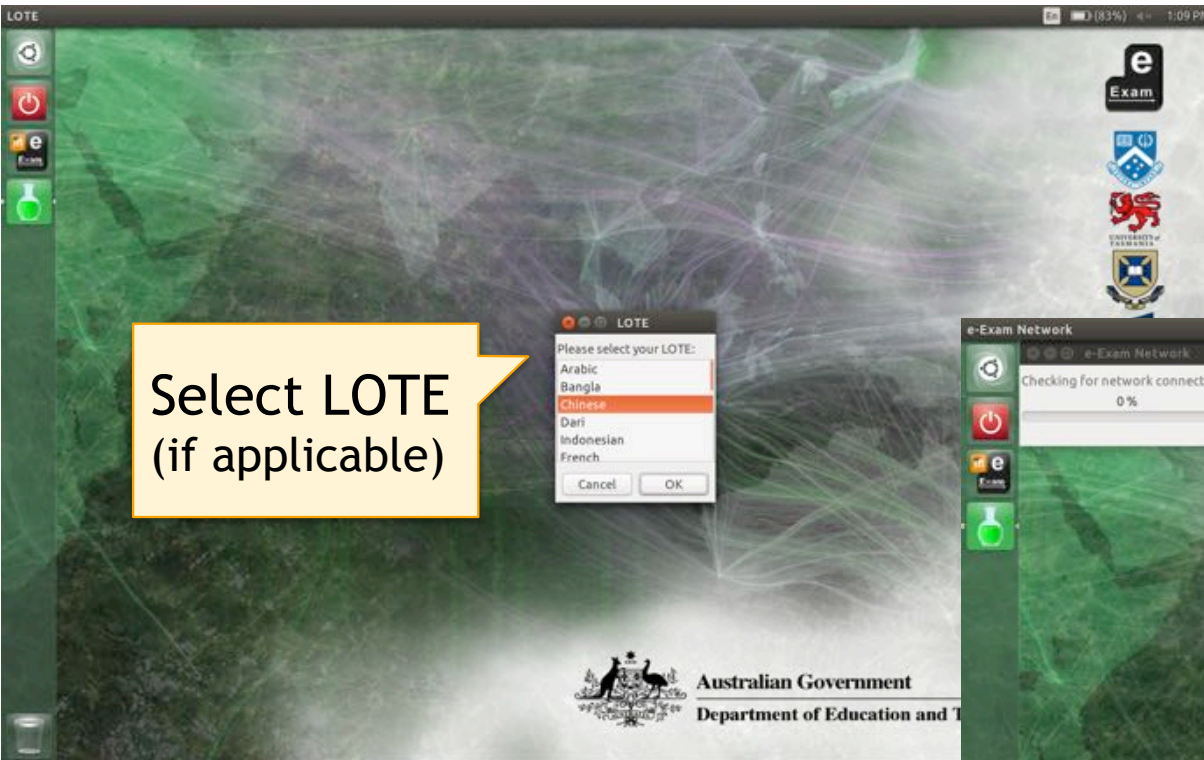
Log onto Moodle and start the exam

Log into LMS server. Network access was whitelisted.
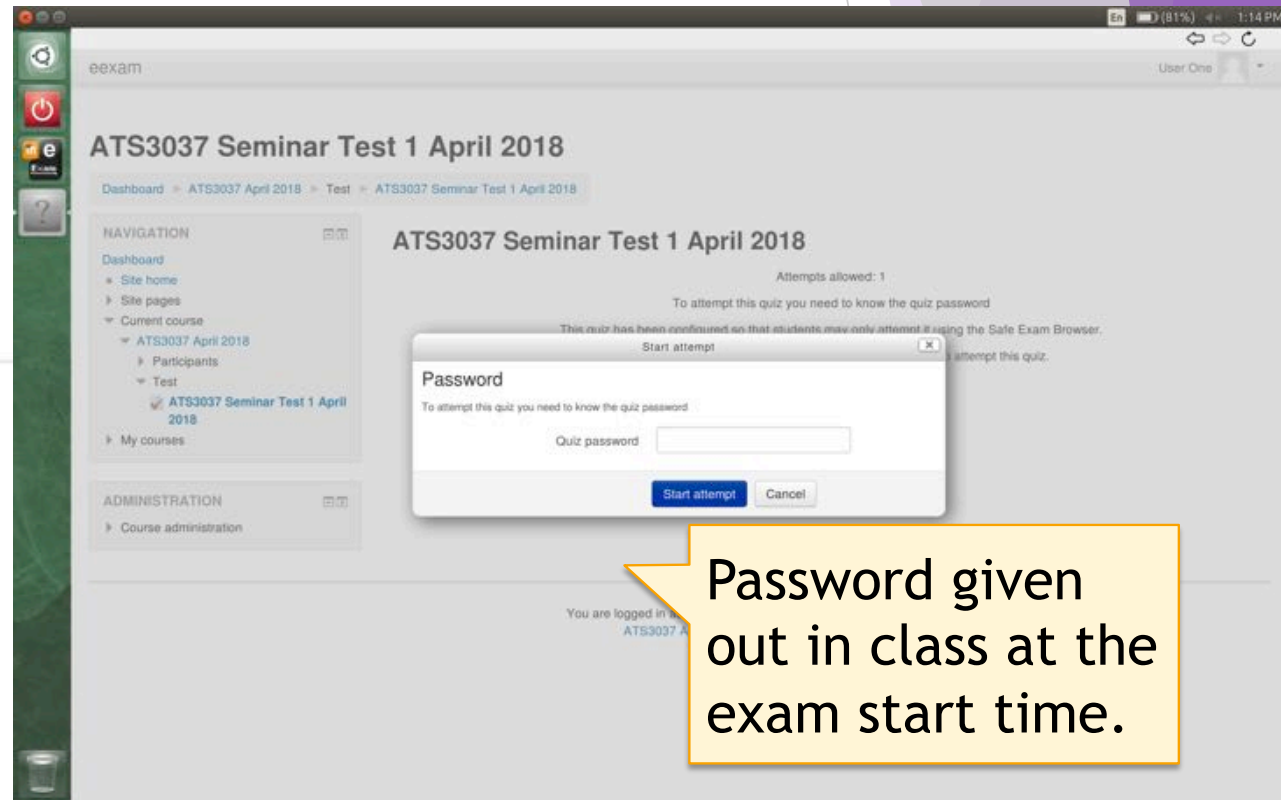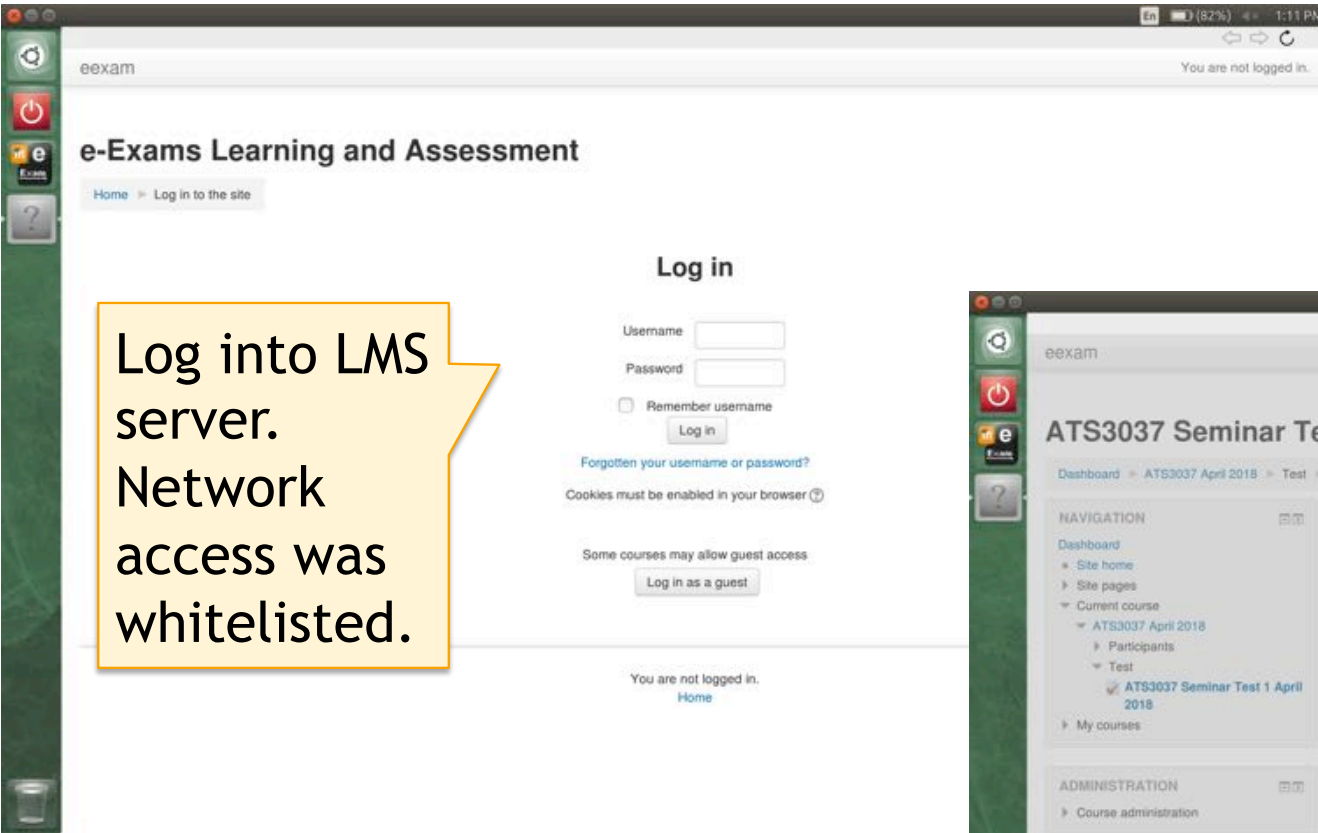
Password given out in class at the exam start time.

Questions

Lecture test 1

○ True

6. 我们大学有二个汉语老师。

○ True

○ False

7. 他要打电话女朋友。

○ True

○ False

Question 5

Not yet answered

Marked out of
32.00

⚑ Flag question

⚙ Edit question

Section 3.

Section Mark: 32

Re-organise the following words into meaningful sentences in characters by typing the words into the boxes provided. Then translate the sentence into idiomatic English. Do not simply translate word for word.

Please DO NOT include punctuation marks in your Chinese character sentence.

PLEASE IGNORE THE MARK YOU RECEIVE AUTOMATICALLY WHEN YOU SUBMIT THIS QUESTION. THIS QUESTION WILL BE MANUALLY MARKED.

| 中国地图 | 你看 | 干什么 |

Rewrite:

[ ] [ ] [ ]

Translate:

[   ]

A range of form based question types were used in these e-exams.

Questions

Listening test 1

27. k [____] ch [____]

28. j [____] q [____]

Question 5

Not yet answered

Marked out of 24.00

⚑ Flag question

⚙ Edit question

Section 3

Indicate the tones you hear.

Please enter a number for the tone you hear in the appropriate box (e.g. 1, 2, 3, 4 or 0 for neutral).

1. chuang [____] lian [____]

2. cao [____] chang [____]

3. fang [____] xiang [____]

4. guo [____] jia [____]
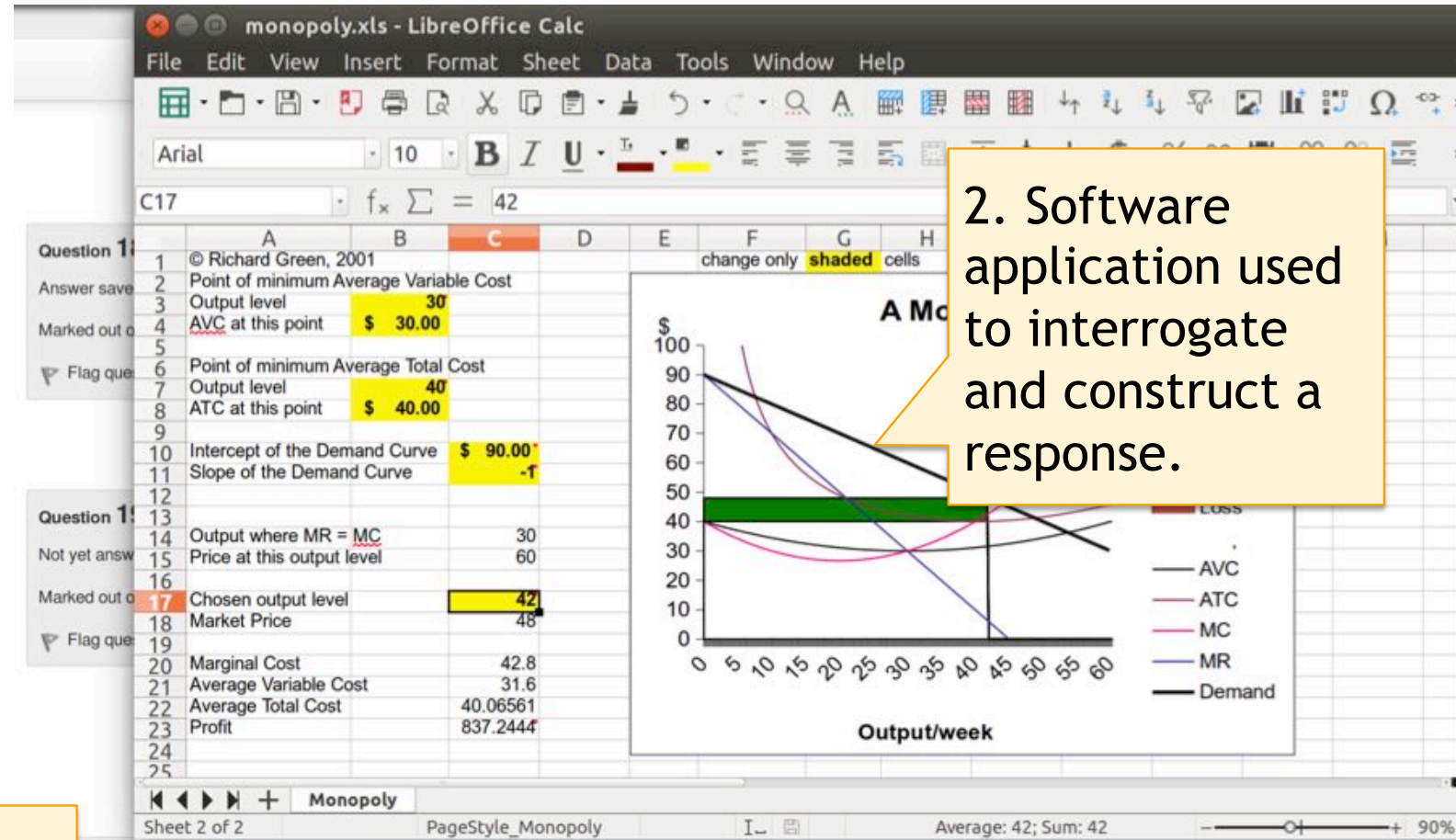
Third party software included.

Questions in Safe Exam Browser

This is an offline dictionary tool 'Dim Sum'. Copy-paste was possible.

Questions

Constructed enquiry

1. Download file

2. Software application used to interrogate and construct a response.

3. Respond via form

Questions

Constructed response

(file upload)

1. Open software

Question 26

Answer saved

Marked out of 1.00

⚑ Flag question

Scratch will be require

To open this application, click on the circular icon on the top left of the screen, and then type 'scratch' into the search box that appears.

Using the default Scratch program, make the Cat sprite run in circles and 'meow' when it touches the sides.

When done, save the file to the answers drive using your name as the file name.

1. Provide a one or two sentence summary of the commands you used in your response in the text box below.
2. Then attach your scratch program file to this question.
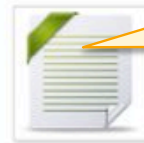
Scratch program is a cat game where we make cute and fluffy characters run in circles, bump into each other and make meow noises. We can keep typing a very long text based response into here. The system may spxll check your work.

2. Use software application to construct a response.

Maximum size for new files: Unlimited

▶ 📁 Files
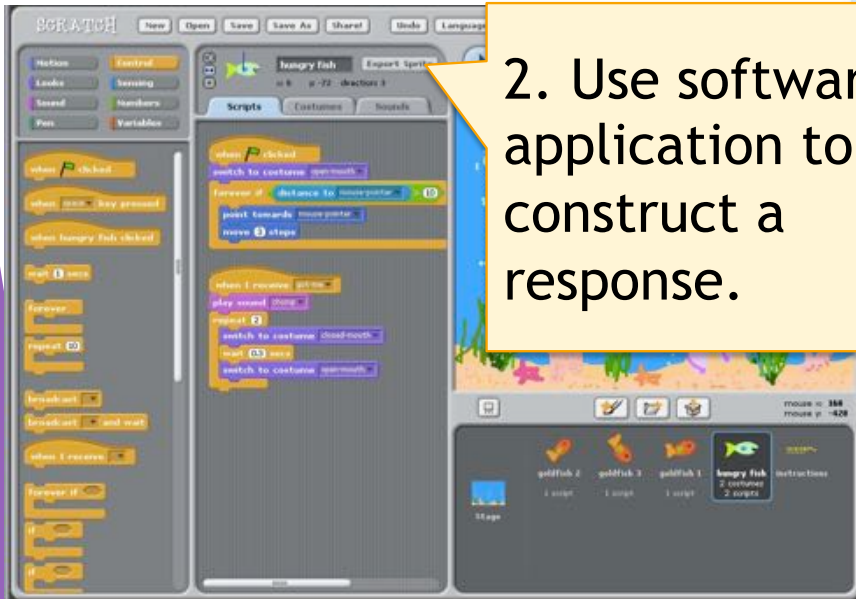
3. Respond by file upload

example.sb2

Multi layered backup - Network Outage

Admin User

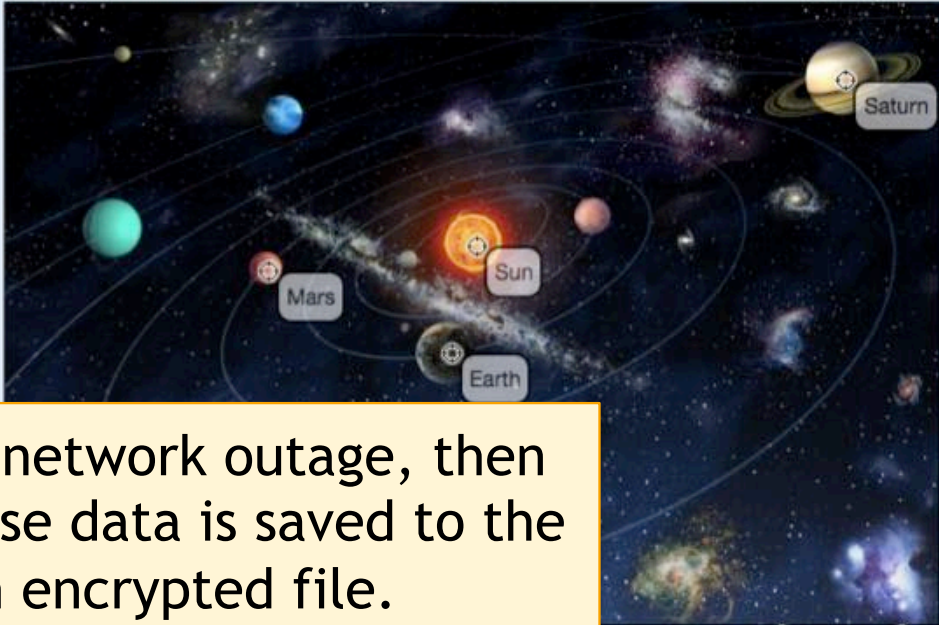| i	1	2	3	4	5	6
7	8
14	15
21	22
27	28

Finish attempt ...

Last saved to the server: 15:49

Save to server failed. You can continue working.
Responses have been saved to local storage..

Server: 3:52pm

a) Whilst there is a network connection student data is saved to the server each minute.

b) If there is a network outage, then student response data is saved to the USB drive in an encrypted file.

Question 8

Answer changed

Drag-and-drop below markers to corresponding celestial objects.

Saturn

Sun

Mars

Earth

Mercury   Uranus   Neptune   Pluto   Venus

Question 9

Answer changed

Marked out of 1.00

⚐ Flag question

We are what we [repeatedly] do. Excellence, then, is not an [act], but a [habit].

Aristotle

Drag-and-drop words to correct the above sentence:

Multi layered backup - Network Outage at Submission

- If at submission time there is a network outage, then student response data is saved to the USB drive in an encrypted file.
  - Ideally the student should try again or call an exam supervisor for help.
- If the connection cannot be reinstated then after the exam the response file is retrieved from the USB and uploaded to Moodle.

Successful Submission

e-Exam Demo

QUIZ NAVIGATION

User One

i	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24

Show one page at a time

Finish review

Started on	Tuesday, 17 April 2018, 5:29 PM
State	Finished
Completed on	Tuesday, 17 April 2018, 5:42 PM
Time taken	12 mins 51 secs
Grade	Not yet graded

Information

⚑ Flag question

Complete the following computer marked questions.

Question 1
Correct
Mark 1.00 out of 1.00
⚑ Flag question

Moodle is the most popular LMS in the world today.

Select one:
- ● True ✓
- ○ False

Question 2
Incorrect
Mark 0.00 out of 1.00
⚑ Flag question

What do you call a question format in which students must uniquely associate a set of prompts with a set of options?

Answer: matchings ✗

Question 3
Correct
Mark 1.00 out of 1.00

What was the version of Ubuntu was relased in April 2012?

Answer: 12.04 ✓

> **Immediate feedback (optional setting)**

> **Confirmed submission to server triggers USB self clean up ready for next exam.**

If not submitted – post-exam upload to LMS

This quiz uses fault-tolerant mode. Adminstrators can upload exported responses

This quiz has been configured so that students may only attempt it using the Safe Exam Browser.

You must use an approved version of Safe Exam Browser to attempt this quiz.
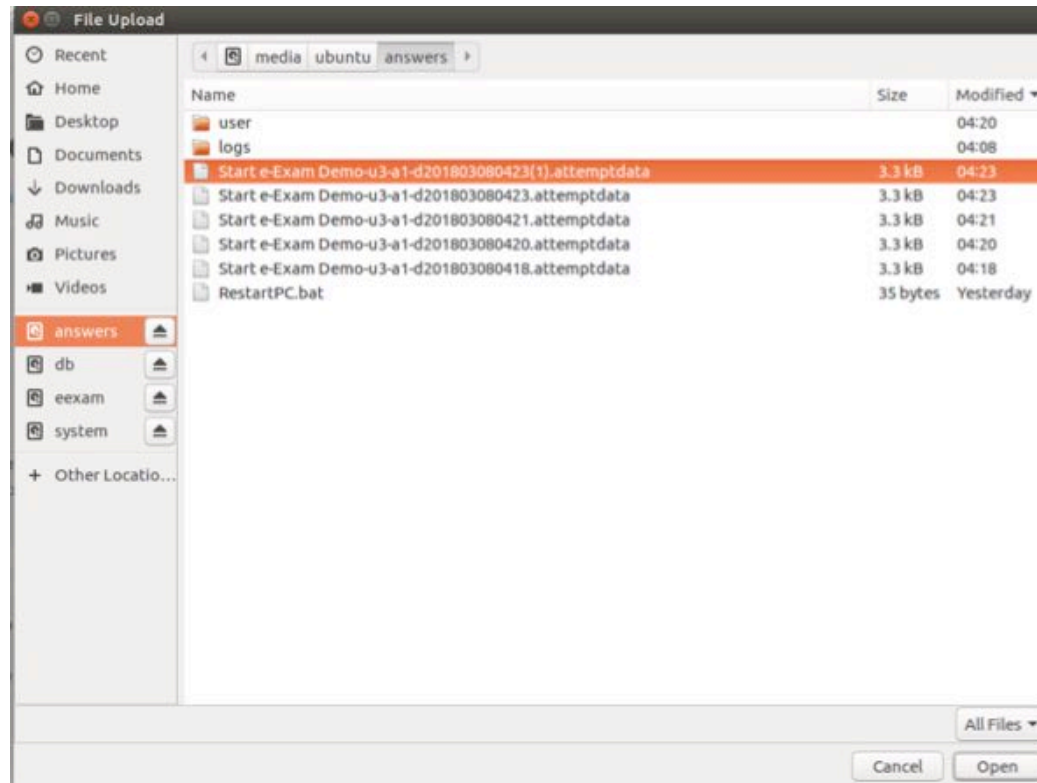
From the Quiz page, Admins/teachers can upload encrypted response file(s) from USB (can be done in bulk too using a large hub + our Admin tool)

After upload: USB clean-up using Admin tool to ready for next use

In-class BYO Laptop robust Moodle use (Monash example)

Tables + chairs in standard 'collaborative' layout classroom.

Power sockets in tables + WiFi (Ethernet can be used too, but want not in this case).

Ensure students sit 90degree to avoid overseeing other screens.

Possibility: add cardboard 'screens/dividers'.

Possibility: use random order for questions, random order for distractors.

Technical References

With thanks to these contributors!

Martin Coleman – Lead e-Exam system software developer.

Safe Exam Browser (Daniel Schneider and SEB team at ETH Zurich).

SEB Moodle plugin for keys (by Tim Hunt at Open University, UK).

Moodle Quiz fault-tolerant plugin (by Tim Hunt at Open University, UK).

Moodle Auto enroll plugin (by Mark Ward).

Note: These components cannot be used 'as-is'. We have extended them to enable SEB to operate within the Live Linux USB implementation, modified the key exchange mechanism, added transparent auto save to local storage in the event of network outage and extended the caching of quiz components.

Our work is not done – more to do! :-)

Join us! ... More at http://transformingexams.com