

# Bridging the digital divide with an off-line e-learning and e-assessment platform

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(Monash University)

Presentation ODLAA 6 Feb 2017



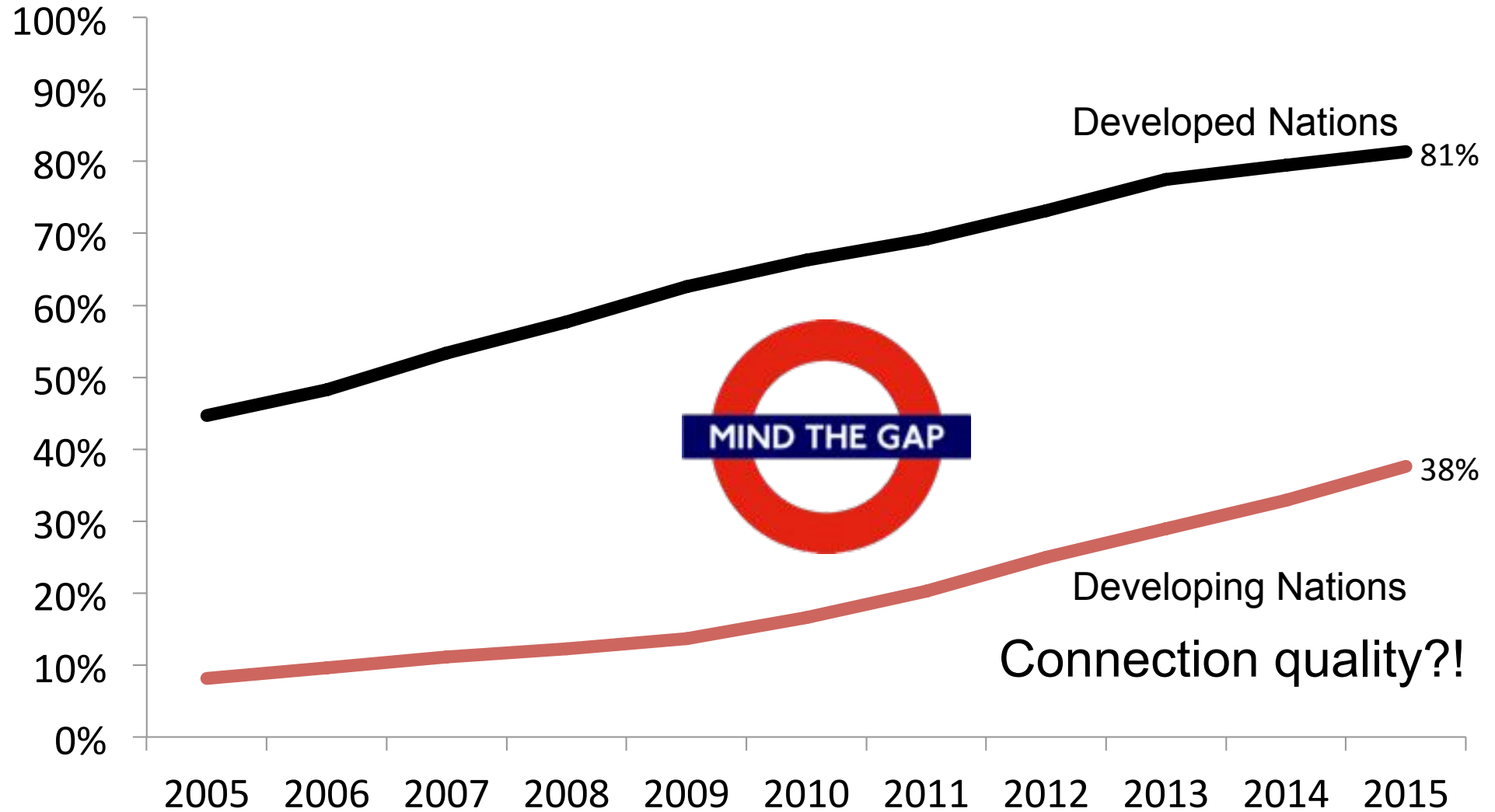
# Global Digital Divide



Quick stats

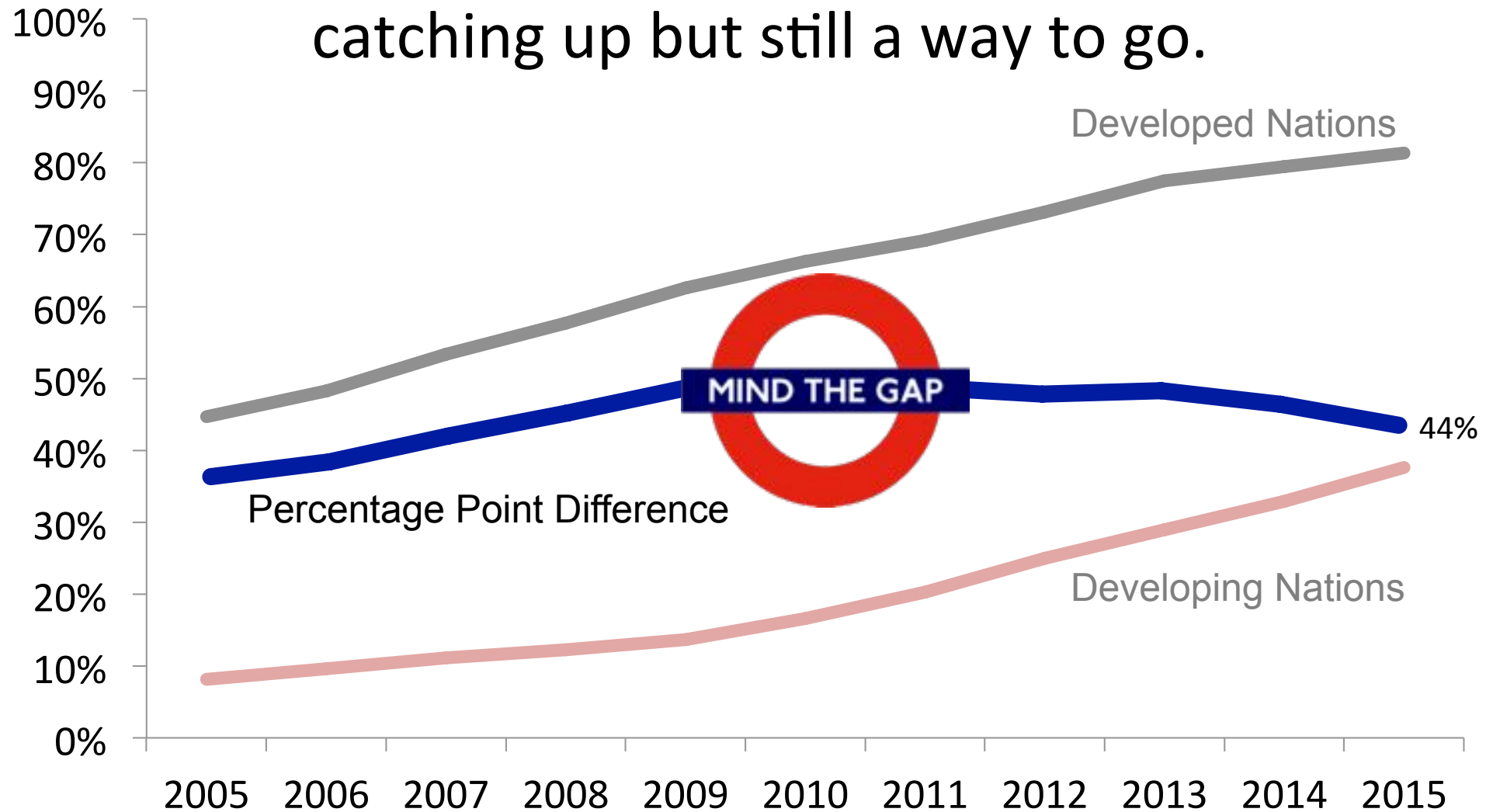
# Global Digital Divide

## Households with Internet at home

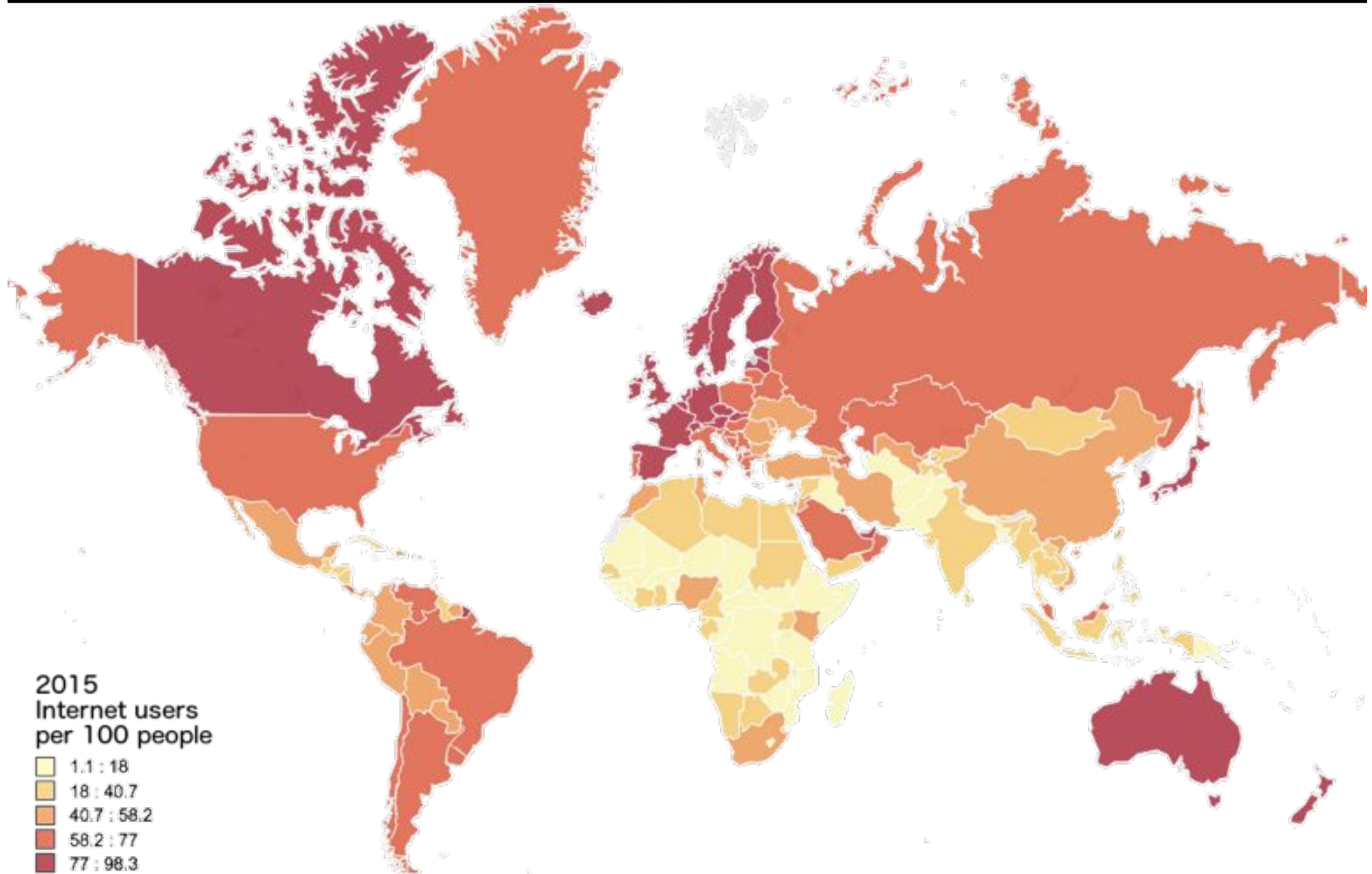


# Global Digital Divide

Households with Internet at home catching up but still a way to go.



# Global Digital Divide



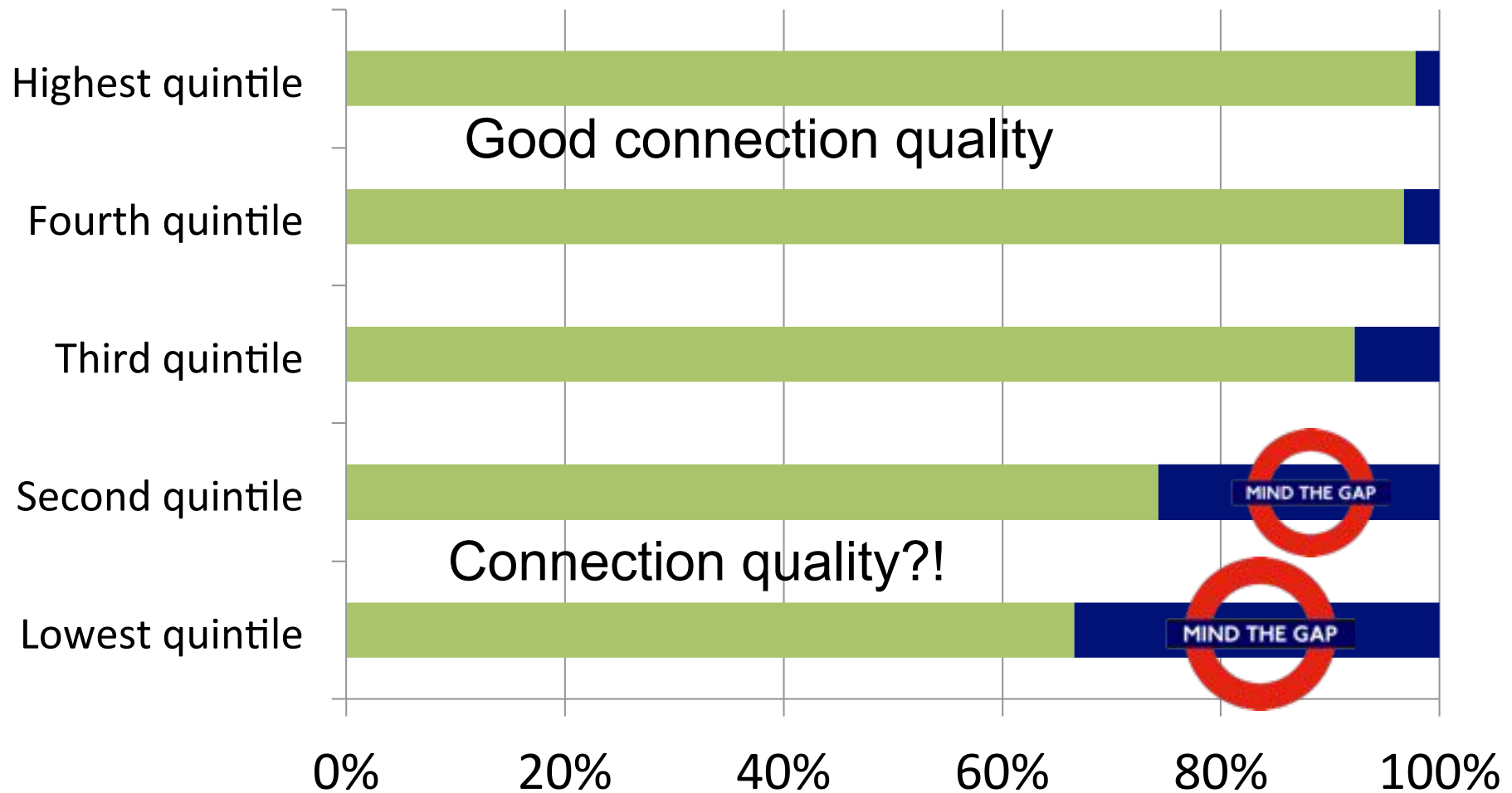
2015  
Internet users  
per 100 people

- 1.1 : 18
- 18 : 40.7
- 40.7 : 58.2
- 58.2 : 77
- 77 : 98.3

Source: World Development Indicators

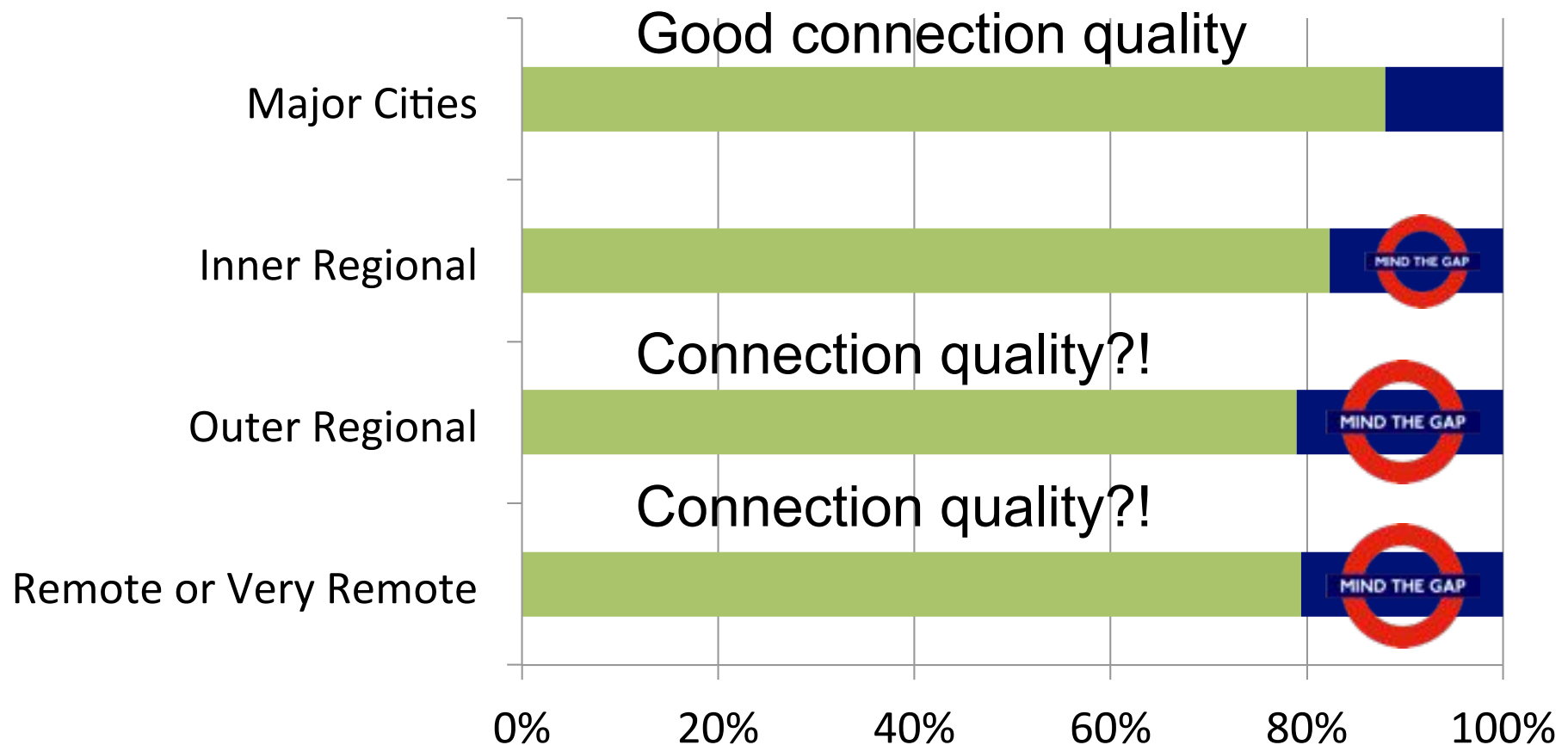
# Australia – by income

**33% of the poorest 20% of households are offline.**  
**Only 2% of the richest 20% are offline.**



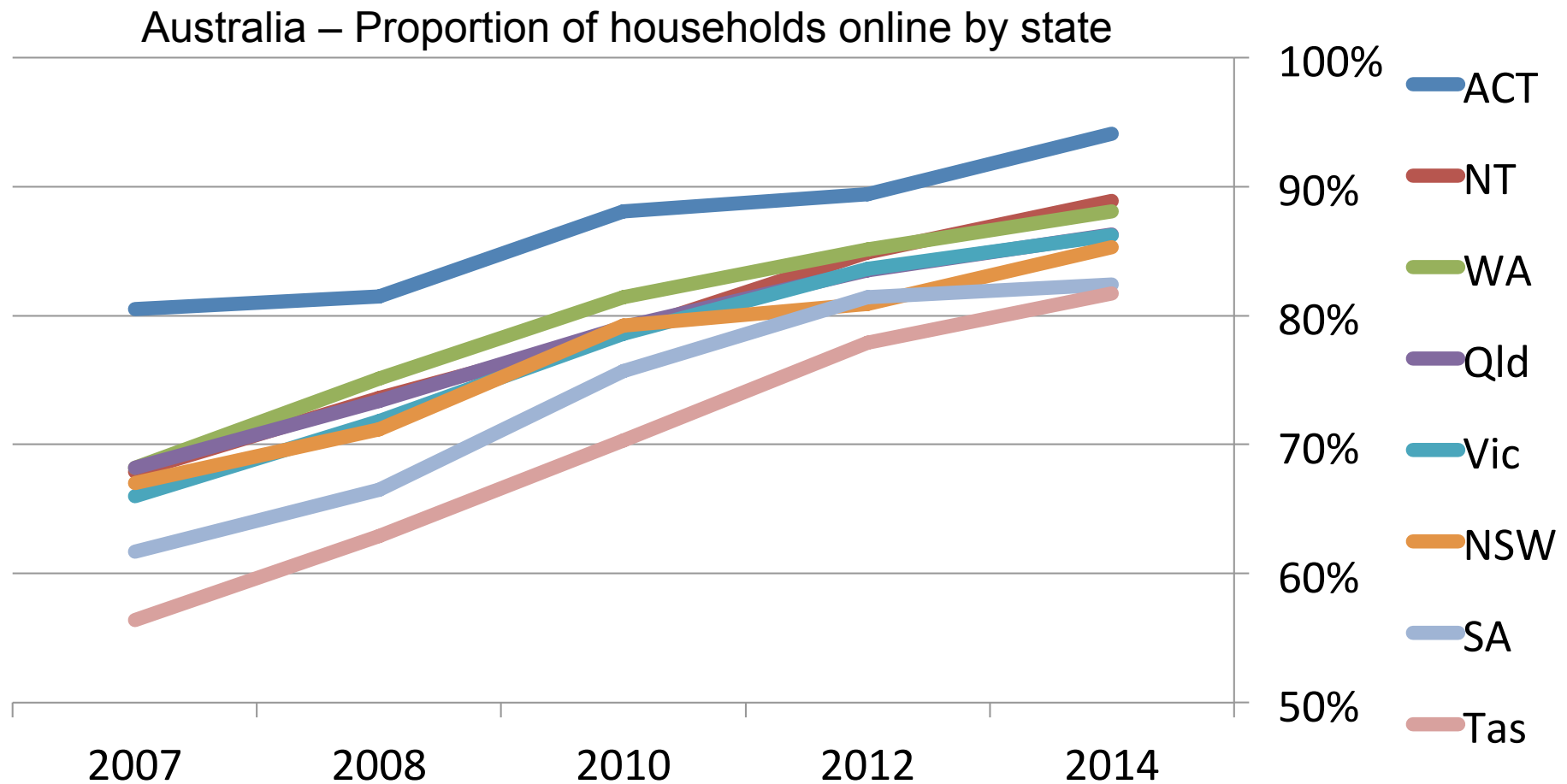
# Australia – by location

**21% of outer regional and remote households are offline. 12 % of major city house holds are offline.**



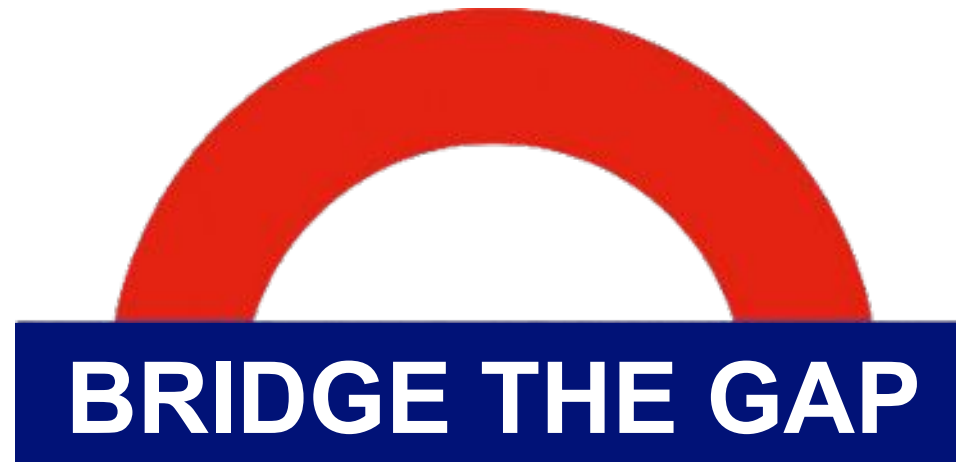
# Australia – by state

**Australia wide 14% of households don't have Internet access at home.**





# Ideas



## Leveraging Open Tools

# Current Solutions – offline or online?

There are trade-offs for any distance e-learning solution.

Online  
(net)

- **Long way to travel.**
- **Efficient system management.**
- Equipment: need to supply equipment or facilities for BYOD
- **Help at hand** and spaces can be supervised, live request.
- **Needs reliable network** at site.

- **No travel.**
- **Efficient system management.**
- Students supply equipment.
- **Help via live chat.**
- **Large media files problematic.**
- Network **connectivity can be lacking and costly** at home.

Hybrid system ?



Offline

- No longer applicable. (CD ROM)

- **No travel.**
- **Less efficient system management** – requires Post.
- Students supply equipment.
- **Help via phone or delayed.**
- **Large media files not an issue.**
- Network **reliability not an issue reduced data usage charges.**

On Campus / learning hub

Distance learning at home

# Hybrid solution - leveraging existing work

## Transforming Exams Across Australia

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



>> **Authentic assessment in exams using secured BYOD** <<

Dr **Mathew Hillier**;  
Leader OLT national project. Seed leader

Monash University



Dr **Andrew Fluck**;  
Originator of USB e-exam concept. Seed partner.

University of Tasmania



Dr **Michael Cowling**, Mr Kenneth Howah  
Seed trial site.

Central Queensland University



Dr **Kim Blackmore**

Australian National University



Assoc. Prof. **Paul Newhouse**

Edith Cowan University



Dr **Matthew Bower**, Prof. Dominic Verity

Macquarie University



Prof. **Marilyn Baird** (H), Mr **Scott Grant** (A)

Monash University



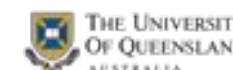
Assoc. Prof. **Shona Leitch**

RMIT University



Dr **Ruth Geer**, Mr Bruce White

University of South Australia



Mr Dominic McGrath

University of Queensland

# TransformingExams.com



# Based on open components

## Component

Ubuntu

Moodle

AMP stack

USB sync scripts

USB system configuration scripts

USB admin scripts

USB sticks

USB Hubs

Home base server



## Status

Mature open source

Mature open source

Mature open source

Custom - TBA

Custom - Bash

Custom - Bash

Commodity h'ware

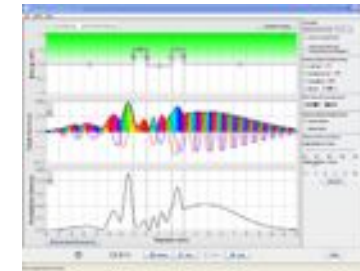
Commodity h'ware

Custom - TBA



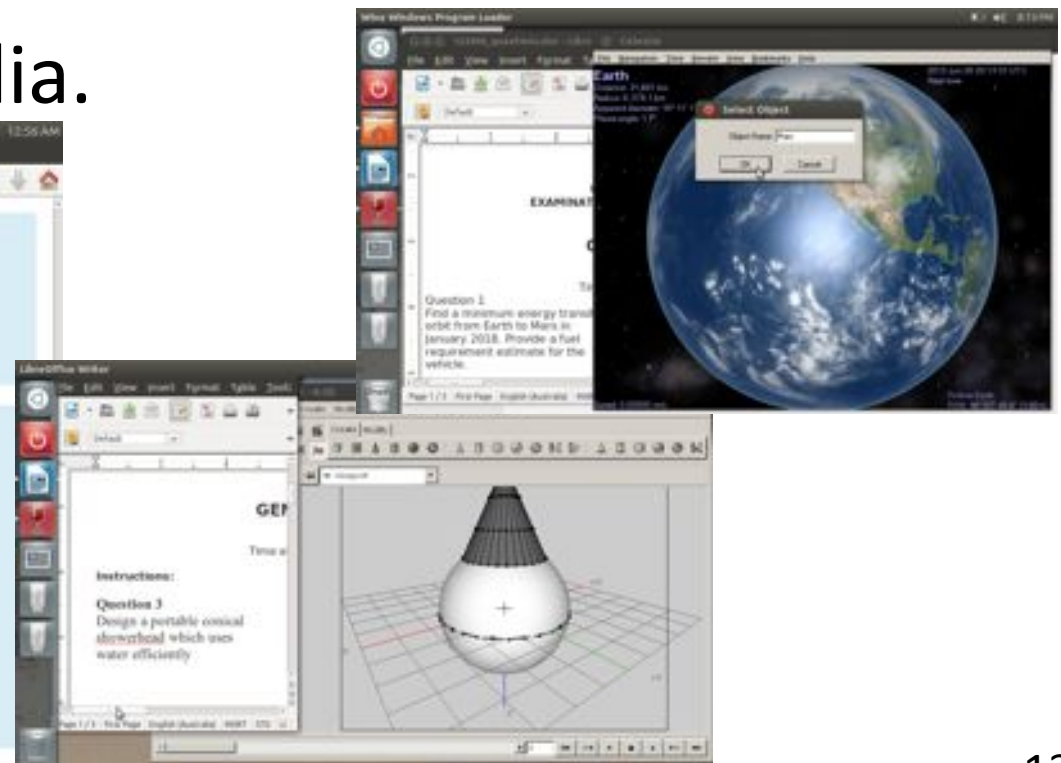
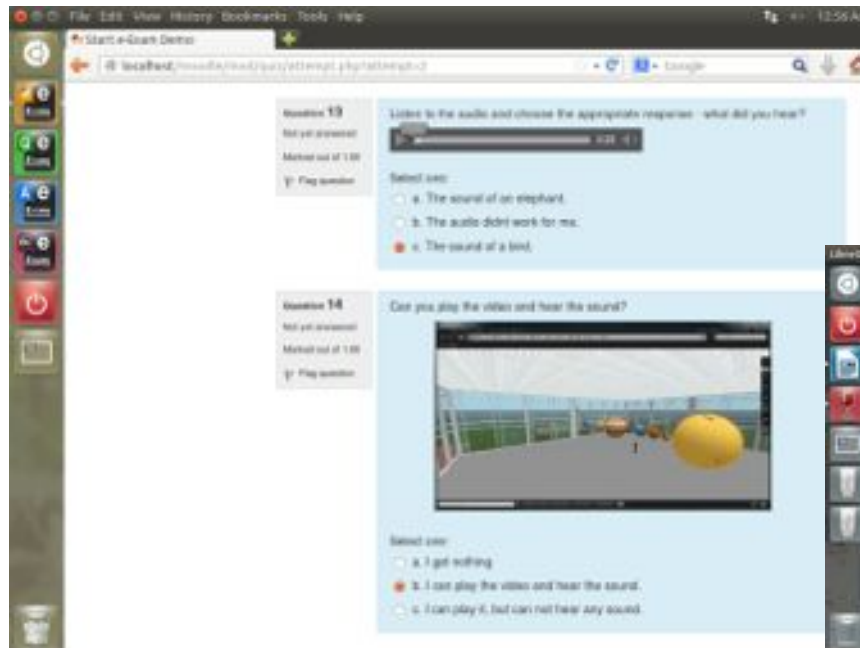
# USB Preloaded with interactive tools

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



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

Moodle LMS with media.



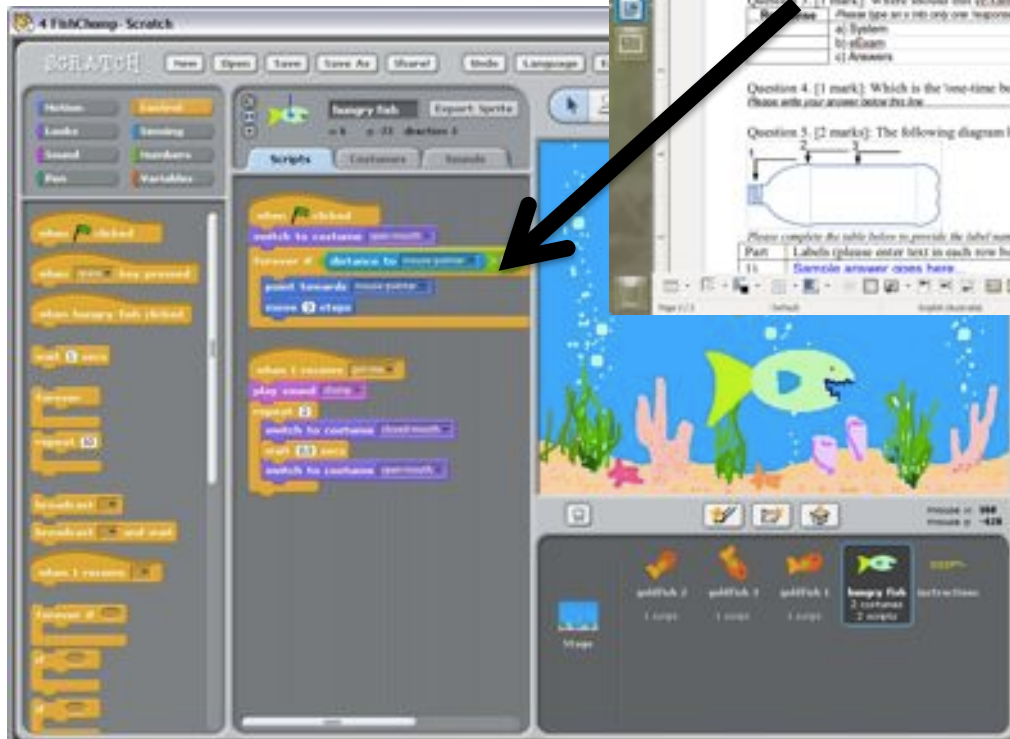
# Preloading with interactive tools

## Linked documents –

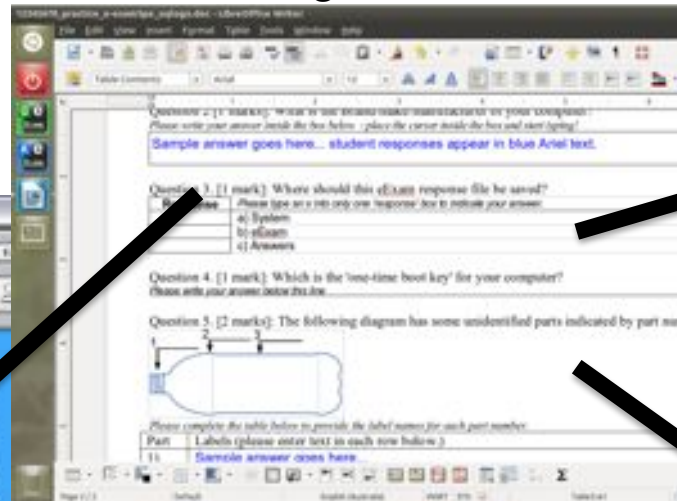
Assignment document with links to launch local apps and resources: graphics, Scratch programming tools, presentation slides, PDFs. All on-board the USB stick.

*No downloads!*

Scratch SDK



Assignment doc



Video

PDF



# Moodle and OpenSim Working Together

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

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



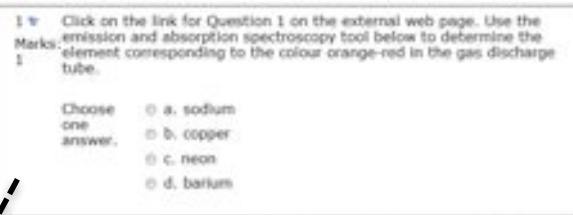
*Set up Quiz in the LMS. Results are stored in the in grade book.*



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



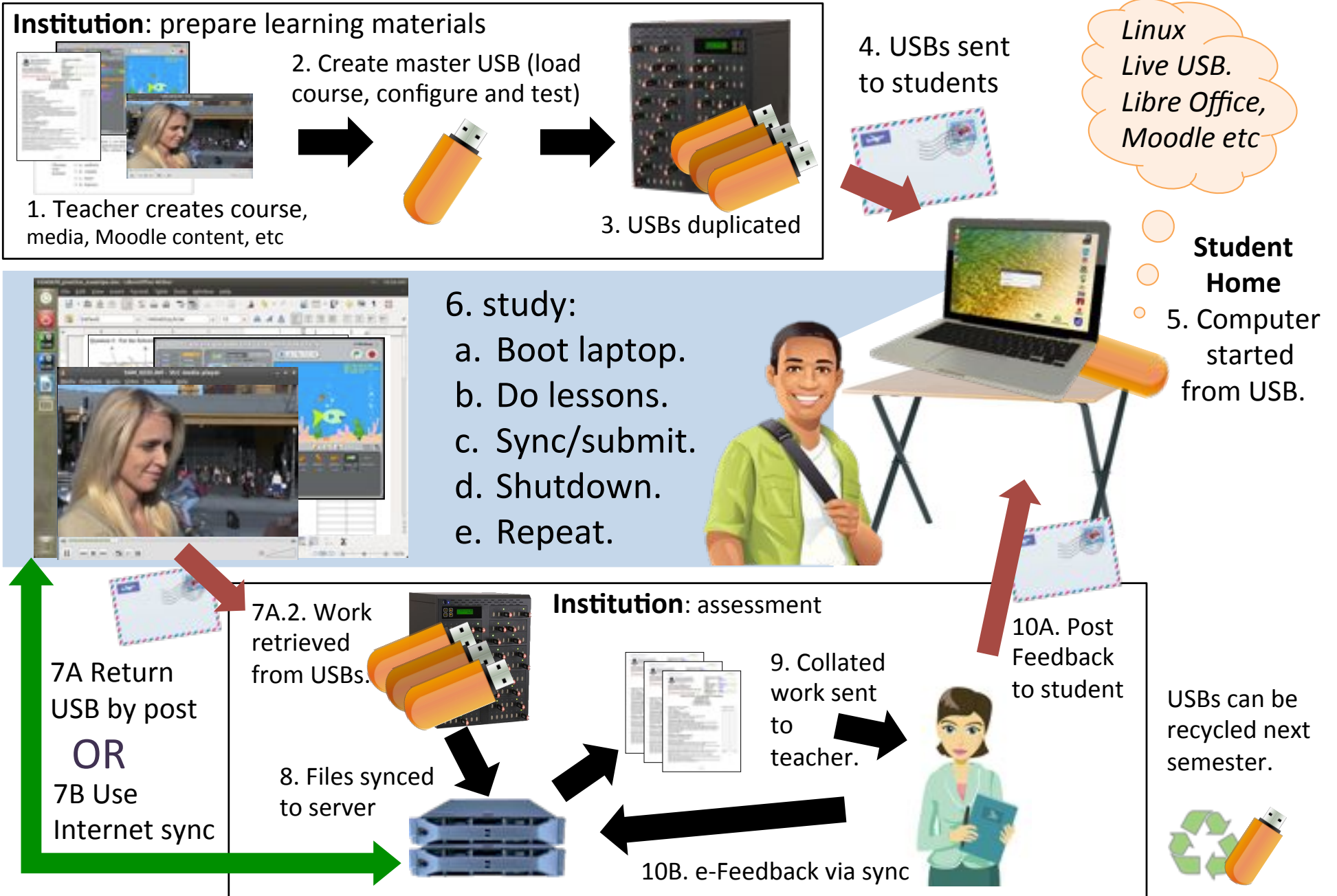
*Student undertakes assessment in the virtual world*



Username	Completion	Score	Grade	Marking	Feedback	Grade	Marking	Feedback
...	...	...	...	...	...	...	...	...

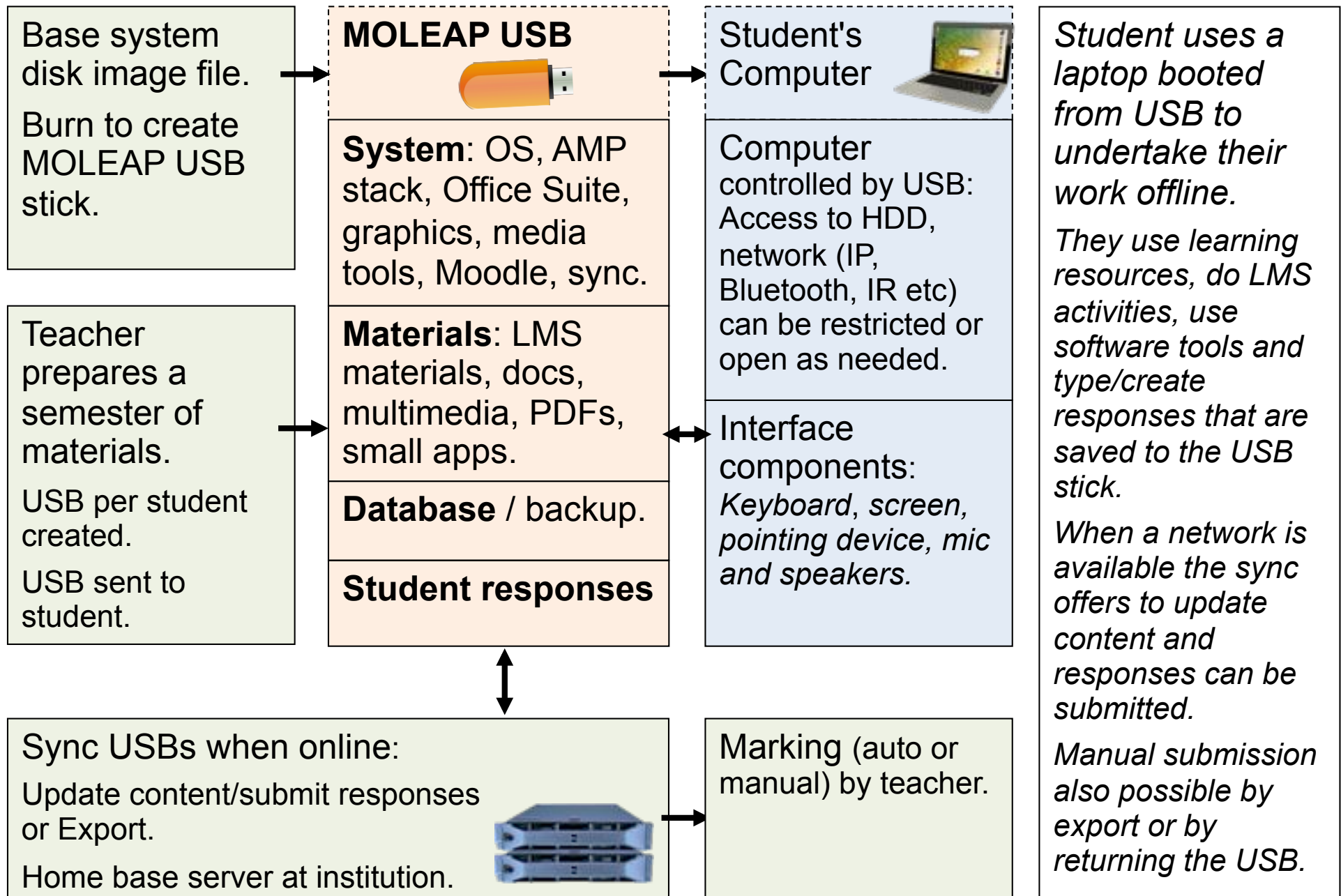


# MOLEAP Workflow – Remote Student

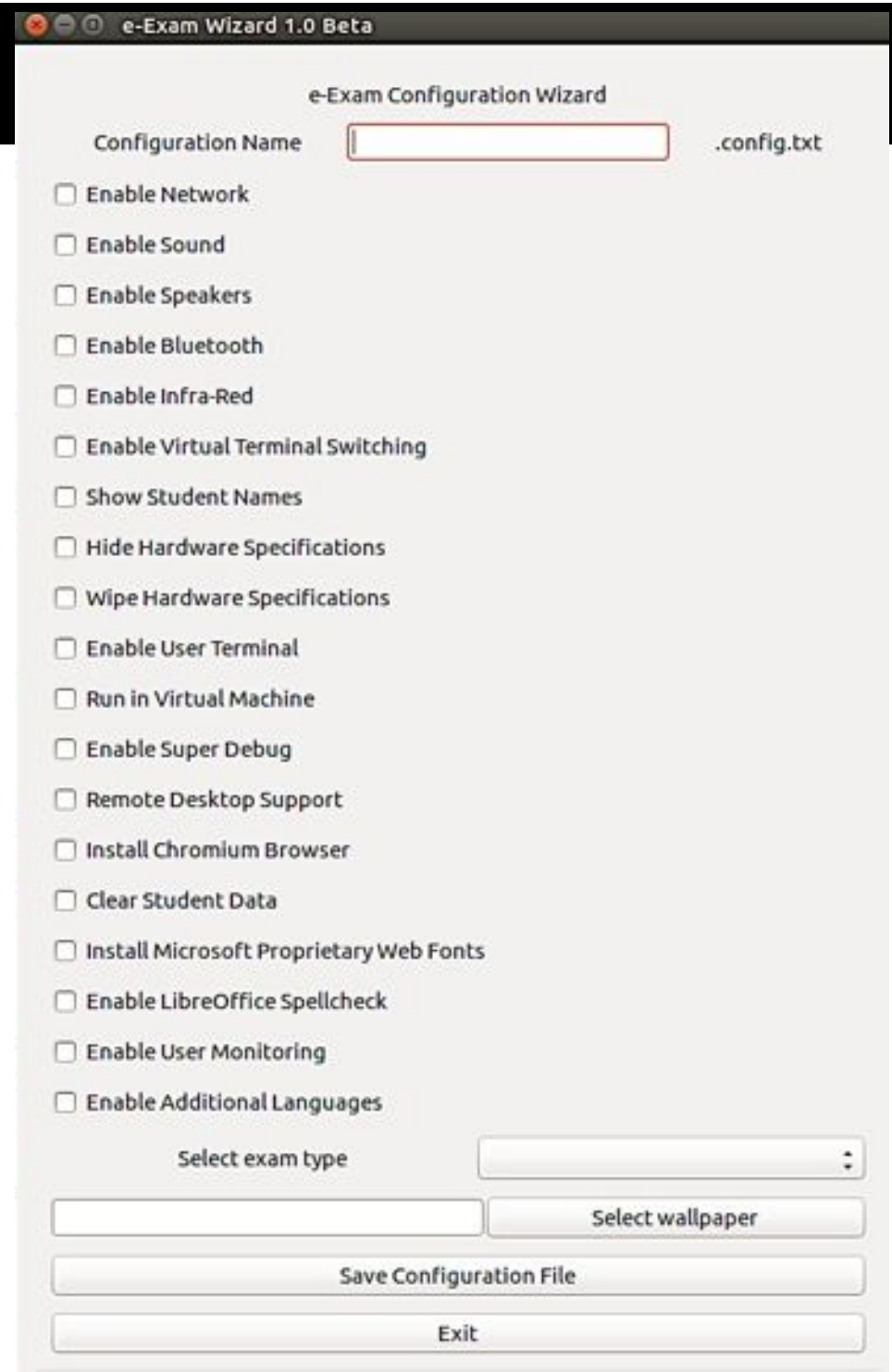




# MOLEAP System Components



# Admin tools



# USB processing station

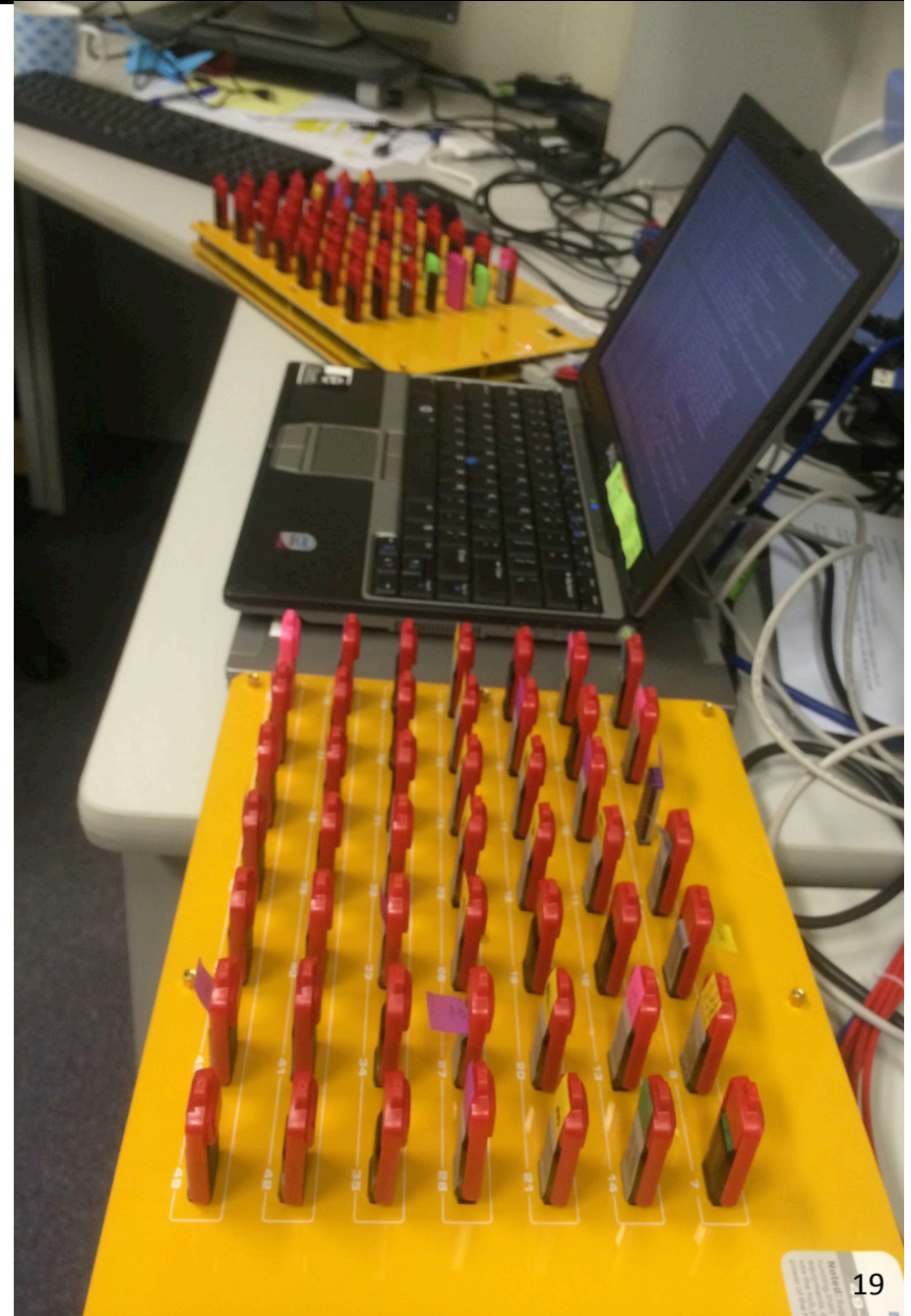
Prototype using commodity components.

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

Helper scripts to

- Initial 'burn' OS to each USB
- Place lesson materials.
- Retrieve lesson responses.
- Set-up for the next lesson.

User friendly admin interface under development.



# System Walk Through (v6)



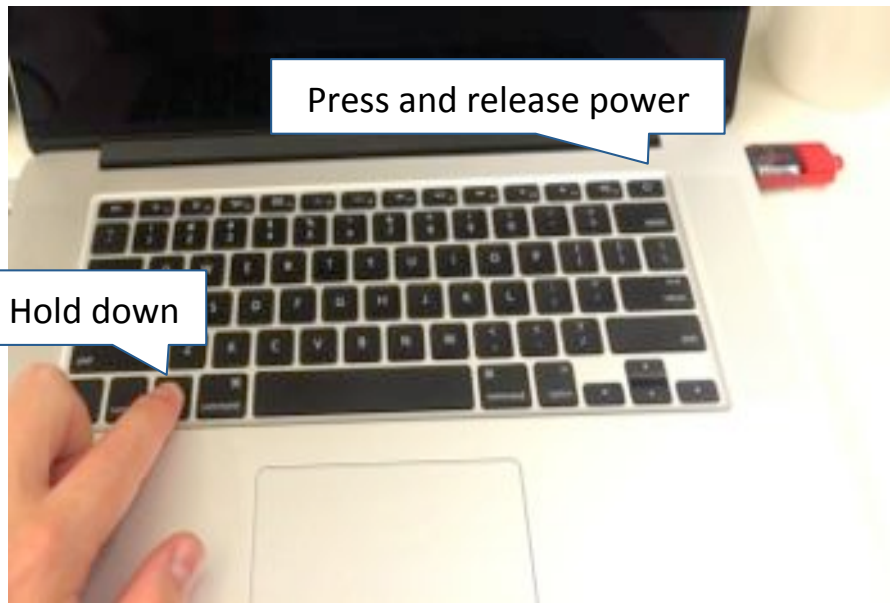
Refer to 'quick start guide' (e-Exam)

# Walk Through: Starting from USB

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

↓  
Apple

2. Hold down ALT then power on.

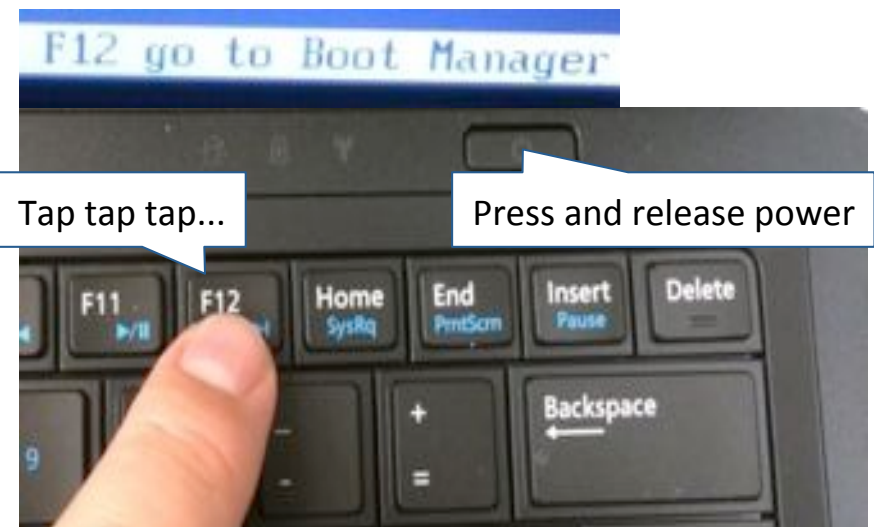


Keep holding ALT until you see...



↓  
Other/Windows\*

2. Power on while tapping 'boot key' (e.g. F12 or... )



Keep tapping until you see...(or similar)

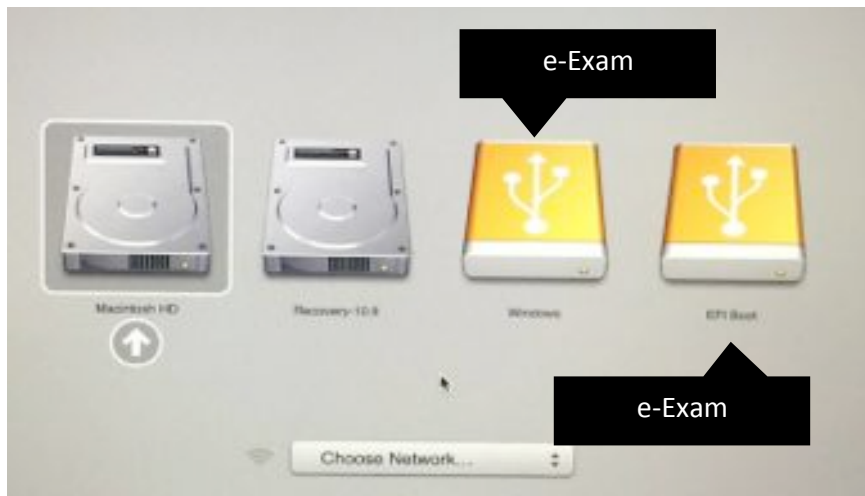
Preparing one-time boot menu...

\* Note Win 8/10: may need to use SHIFT>Restart to access a USB boot option.

# Walk Through: Starting from USB

↓  
Apple

3. Select a yellow icon.  
EFI boot or 'Windows'



Could be either one! So just try.

If you get

**Boot error**

Try the other one!

↓  
Other/Windows\*

3. Select USB device.



It might be labeled something else and probably won't be first.

Win 8/10 users will need to select 'use a device', then choose the USB.



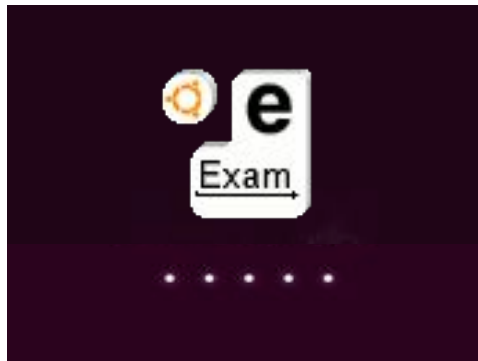
# Walk Through: System start



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

```
ata_id(292): HDIO_GET_IDENTITY failed for '/dev/sdb': Invalid argument
```

4B. System starts.



5. Arrive at system desktop.



# Walk Through: Identify

6. Student now types in their student ID number and name\* (can be disabled).  
Click Start. (what happens next dependent upon chosen mode)





# Walk Through: Document mode

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

Note: original file copied and student number prefixed to file name.

12345678\_practice\_exam5pp.doc - LibreOffice Writer

File Edit View Insert Format Table Tools Window Help

Default Arial 12

Practice Examination, 2016 Practice Exam - PRAC8888

**e Exam UNIVERSITY**

Exam materials (USB/paper) must NOT be removed from the venue. Doing so will be considered academic misconduct. Remember 'File > Save' often. Shortcut "CTRL S" If the page is too big or too small for your screen please use View > Zoom > Page width.

All students to complete	
Venue	Exam Hall
Seat*	8
Student Number	12345678
Family Name	Blogs
First Name	Joe
USB number*	88

\* as applicable

School of Life, The Universe & Everything  
Practice Examination 2016  
PRAC8888 Post Paper Example Exam  
This paper is for all students.

Examination Duration: <as long as you like> minutes  
Reading Time: <as long as you like> minutes

For Examiner Use Only	
Question	Mark

Page 1 / 2 First Page English (Australia) INSRT STD Table2:B7 134%

# Walk Through: Document mode

8. Read questions and type responses into areas indicated.

12345678\_practice\_e-exam5pe\_uqlogo.doc - LibreOffice Writer 6:41 PM

File Edit View Insert Format Table Tools Window Help

Table Contents Arial 12

Question 2 [1 marks]: what is the brand/make/manufacturer of your computer?  
*Please write your answer inside the box below - place the cursor inside the box and start typing!*

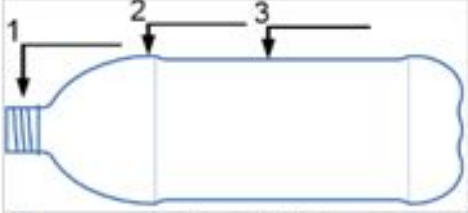
Sample answer goes here... student responses appear in blue Ariel text.

Question 3. [1 mark]: Where should this eExam response file be saved?  
*Please type an x into only one 'response' box to indicate your answer.*

Response	
a) System	
b) eExam	
c) Answers	

Question 4. [1 mark]: Which is the 'one-time boot key' for your computer?  
*Please write your answer below this line*

Question 5. [2 marks]: The following diagram has some unidentified parts indicated by part numbers.



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

Part	Labels (please enter text in each row below.)
1)	Sample answer goes here...

Page 2 / 2 Default English (Australia) INSRT STD TableS:A1 134%

# Walk Through: Document - post-paper

8.1 in 'post-paper' assessment: Make resources available (PDFs, Videos, images) and use specialist software tools to construct responses. Launched via links in the

The image displays a collage of digital resources used in a 'post-paper' assessment. The background is a desktop environment with a green sidebar containing icons for a power button, a search engine, and an exam application. The main area is filled with several overlapping windows:

- LibreOffice Writer:** A document titled '12345678\_practice\_e-exam5pe\_uqlogo.doc' is open, showing a 'Part One' section with a diagram of a person and a speech bubble.
- Google Chrome:** A browser window shows a bookmarks list with entries from 'blogscoped.com', 'creativecommons.org', and 'gamesforthebrain.com'. The main content area displays a diagram of a person with a speech bubble.
- Scratch:** A Scratch script is visible, featuring a 'when green flag clicked' event, a 'say Hello! for 2 secs' block, and a 'say Hello! for 2 secs' block.
- VLC media player:** A video player window titled 'SAM\_0232.AVI' shows a woman with blonde hair in a city street.
- FishChomp:** A game interface titled 'FishChomp' shows a blue background with a green flag, a red flag, and a fish. The game includes a 'when green flag clicked' event, a 'say Hello! for 2 secs' block, and a 'say Hello! for 2 secs' block.
- Scheduler:** A table with columns for date, time, and location is visible. The table contains the following data:

Date	Time	Location
12/10/02		Alimentation : Epicaria
12/10/02		Alimentation : Confiserie
12/10/02		Alimentation : Boulangerie
12/10/02		Alimentation : Bar
12/10/02		Crédit Bitere
12/10/02		GAB Orly-Caupain
12/10/02		Lepain Sylvestre
01/02/03		Ahmed Donsaha-Saplan

# Walk Through: Document mode

9. Remember to save (CTRL S). When done use File > Exit.

[there is a 2 min 'auto recovery' save]

The screenshot shows the LibreOffice Writer interface with a document titled "12345678\_practice\_e-exam5pe\_uqlogo.doc". The File menu is open, showing options like New, Open, Save, and Exit. The document content includes several exam questions and a table for labeling parts of a diagram.

2. [1 mark]: What is the brand/make/manufacture of your computer?  
Please type your answer inside the box below - place the cursor inside the box and start typing!  
Your answer goes here... student responses appear in blue Ariel text.

3. [1 mark]: Where should this eExam response file be saved?  
Please type an x into only one 'response' box to indicate your answer.

Response	a) System
	b) eExam
	c) Answers

4. [1 mark]: Which is the 'one-time boot key' for your computer?  
Please type your answer below this line

5. [2 marks]: The following diagram has some unidentified parts indicated by part numbers.

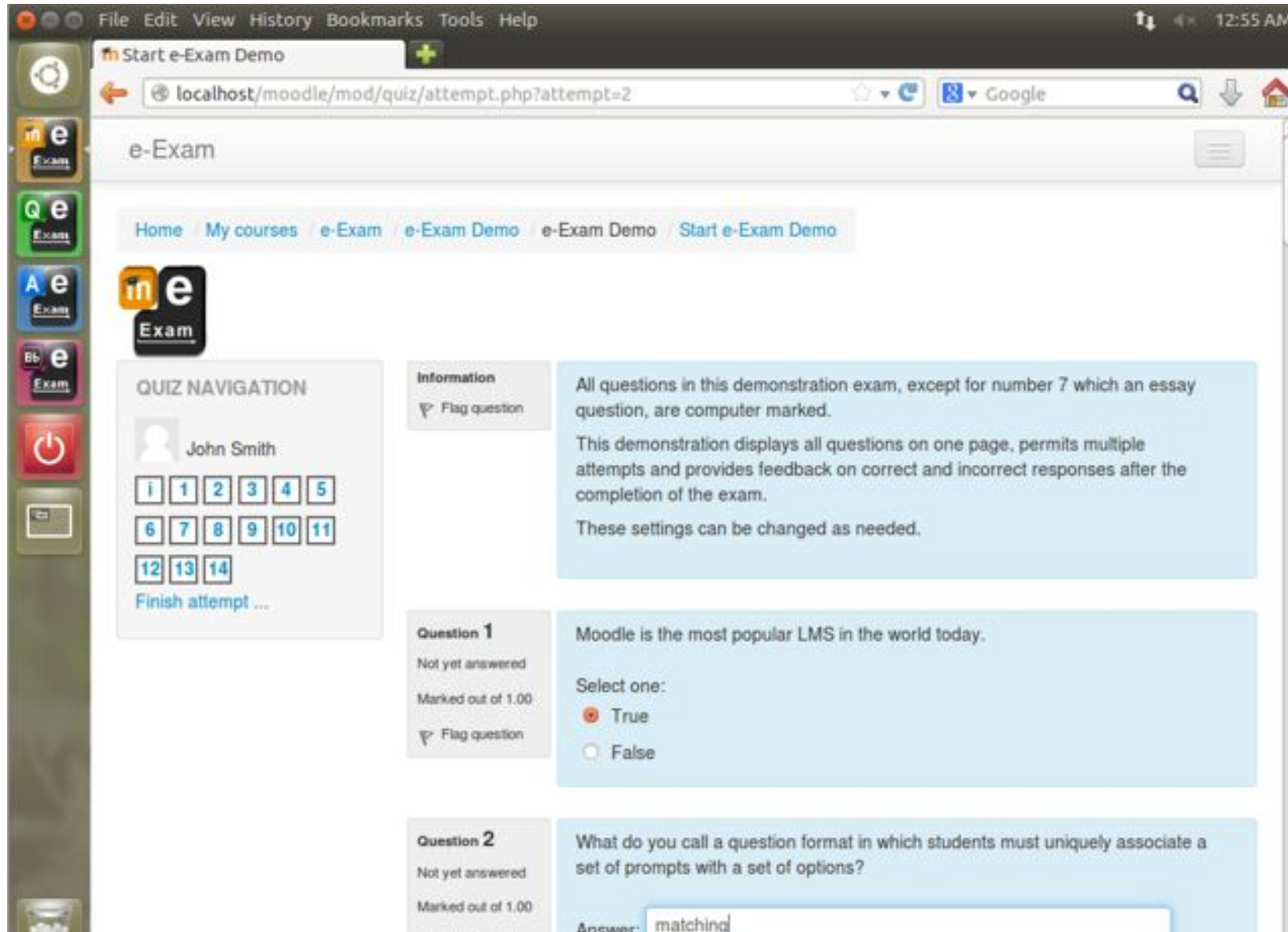
Please complete the table below to provide the label names for each part number.

Part	Labels (please enter text in each row below.)
1)	Sample answer goes here...

Page 2 / 2 | Default | English (Australia) | INSRT | STD | TableS:A1 | 134%

# 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 needed.



The screenshot shows a web browser window with the address bar displaying `localhost/moodle/mod/quiz/attempt.php?attempt=2`. The page title is "e-Exam". The breadcrumb trail is: Home > My courses > e-Exam > e-Exam Demo > e-Exam Demo > Start e-Exam Demo. The user is identified as John Smith. The quiz navigation shows questions 1 through 14, with question 1 selected. The main content area displays an information box and two questions. Question 1 is a true/false question: "Moodle is the most popular LMS in the world today." with "True" selected. Question 2 is a matching question: "What do you call a question format in which students must uniquely associate a set of prompts with a set of options?" with the answer "matching" entered in the input field.

File Edit View History Bookmarks Tools Help 12:55 AM

Start e-Exam Demo

localhost/moodle/mod/quiz/attempt.php?attempt=2

e-Exam

Home My courses e-Exam e-Exam Demo e-Exam Demo Start e-Exam Demo

Quiz Navigation

John Smith

1 2 3 4 5

6 7 8 9 10 11

12 13 14

Finish attempt ...

Information

Flag question

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

Not yet answered

Marked out of 1.00

Flag question

Select one:

True

False

Question 2

Not yet answered

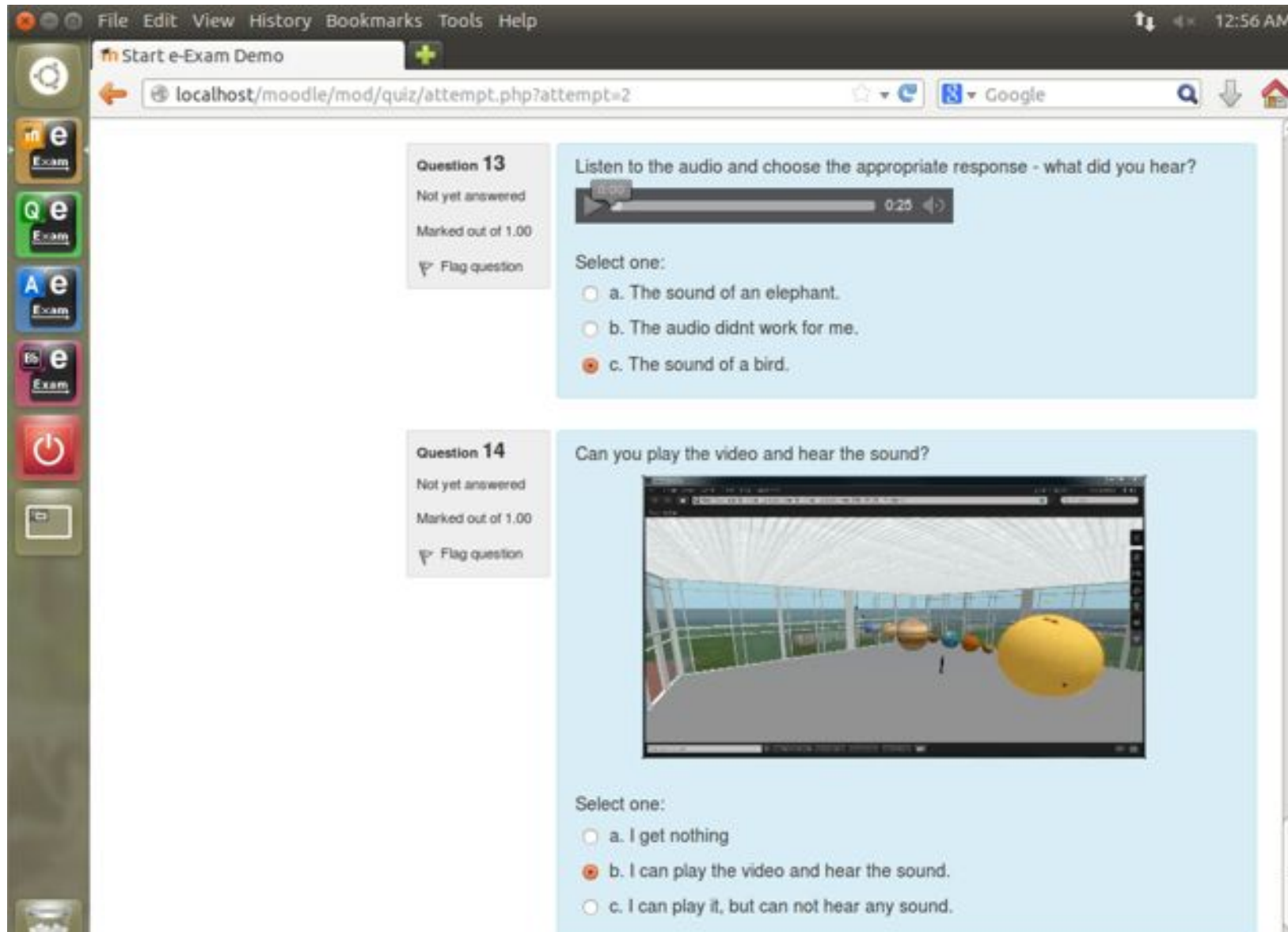
Marked out of 1.00

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

Answer: matching

# on-board LMS Mode

Non-quiz related modules and menus have been removed.  
Large multimedia is possible due on-board storage.



The screenshot shows a web browser window titled "Start e-Exam Demo" with the URL `localhost/moodle/mod/quiz/attempt.php?attempt=2`. The browser interface includes a menu bar (File, Edit, View, History, Bookmarks, Tools, Help) and a status bar (12:56 AM). On the left side of the browser, there is a vertical sidebar with several icons, including a power button and a refresh button. The main content area displays two questions:

**Question 13**  
Not yet answered  
Marked out of 1.00  
Flag question

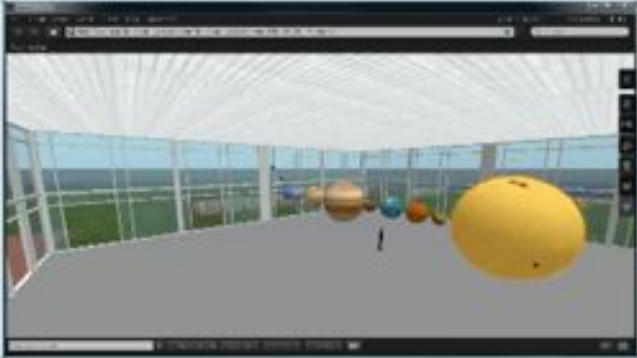
Listen to the audio and choose the appropriate response - what did you hear?

Select one:

- a. The sound of an elephant.
- b. The audio didnt work for me.
- c. The sound of a bird.

**Question 14**  
Not yet answered  
Marked out of 1.00  
Flag question

Can you play the video and hear the sound?

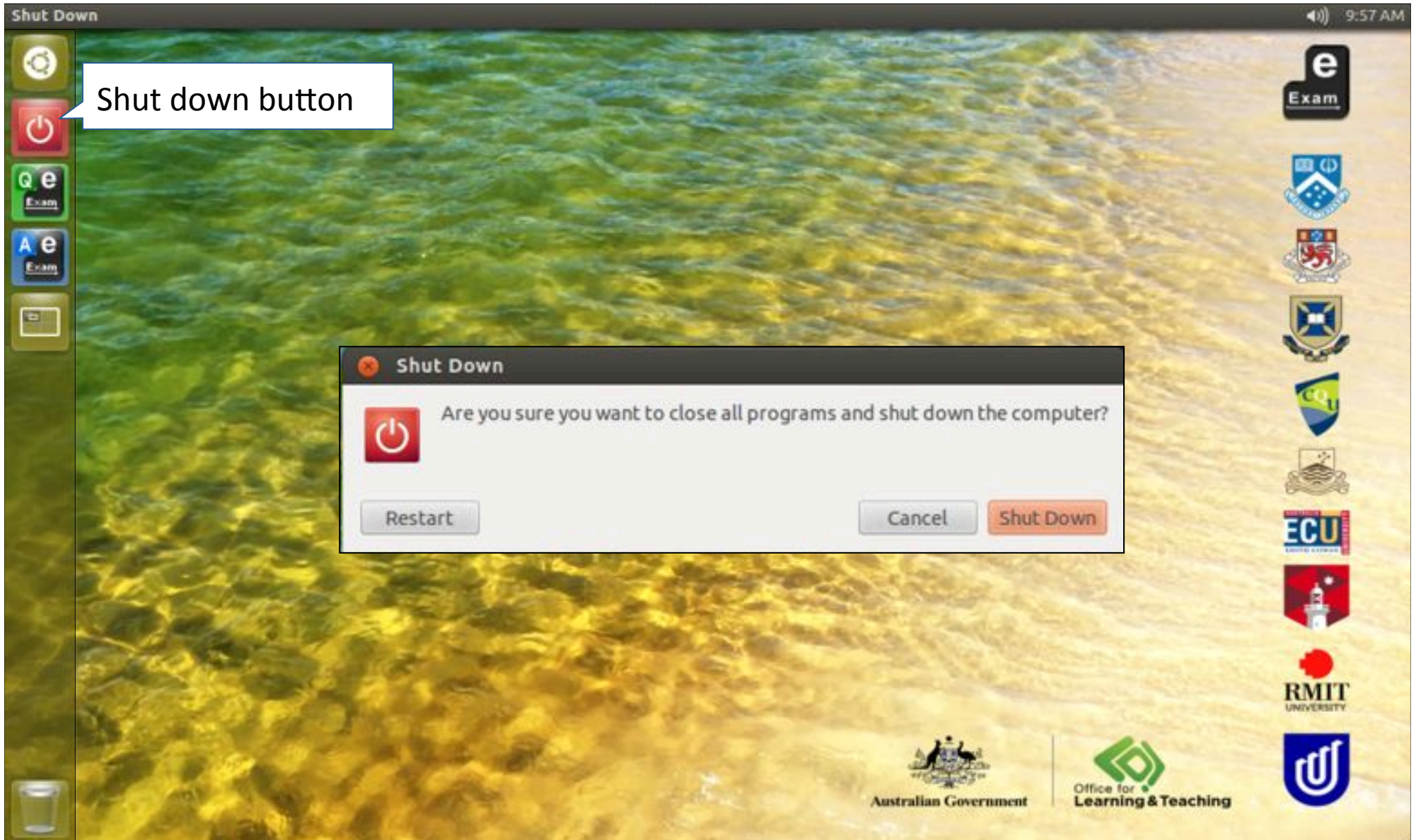


Select one:

- 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.

# Walk Through

10. Shut down the system.



# End

## Cite this resource

Hillier, M (2017) "Bridging the digital divide with an off-line e-learning and e-assessment platform", Presented at 'Expanding Horizons in Open & Distance Learning', Open and Distance Learning Association of Australia conference, 5-7 February, Melbourne, Australia.

Get the full paper <http://moleap.org>

More information OLT e-Exams project

<http://transformingexams.com>



Demo videos and downloads



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