The assessment triad and e-exams: integrity, authenticity, and scalability

Dr Mathew Hillier
Monash University

Dr Andrew Fluck
University of Tasmania

Assessment Integrity and
the Role of Exams
22 Aug 2017, Melbourne.

Transforming Exams Across Australia
Australian Government (Department of Education and Training) National Grant ID15-4747: AU$500K over 3 Years

TransformingExams.com

Australian Government
Department of Education and Training

Acknowledgements - The views expressed do not necessarily reflect the views of the Australian Government Department of Education and Training or participating institutions.

The dissonance of it all!

Real world of work

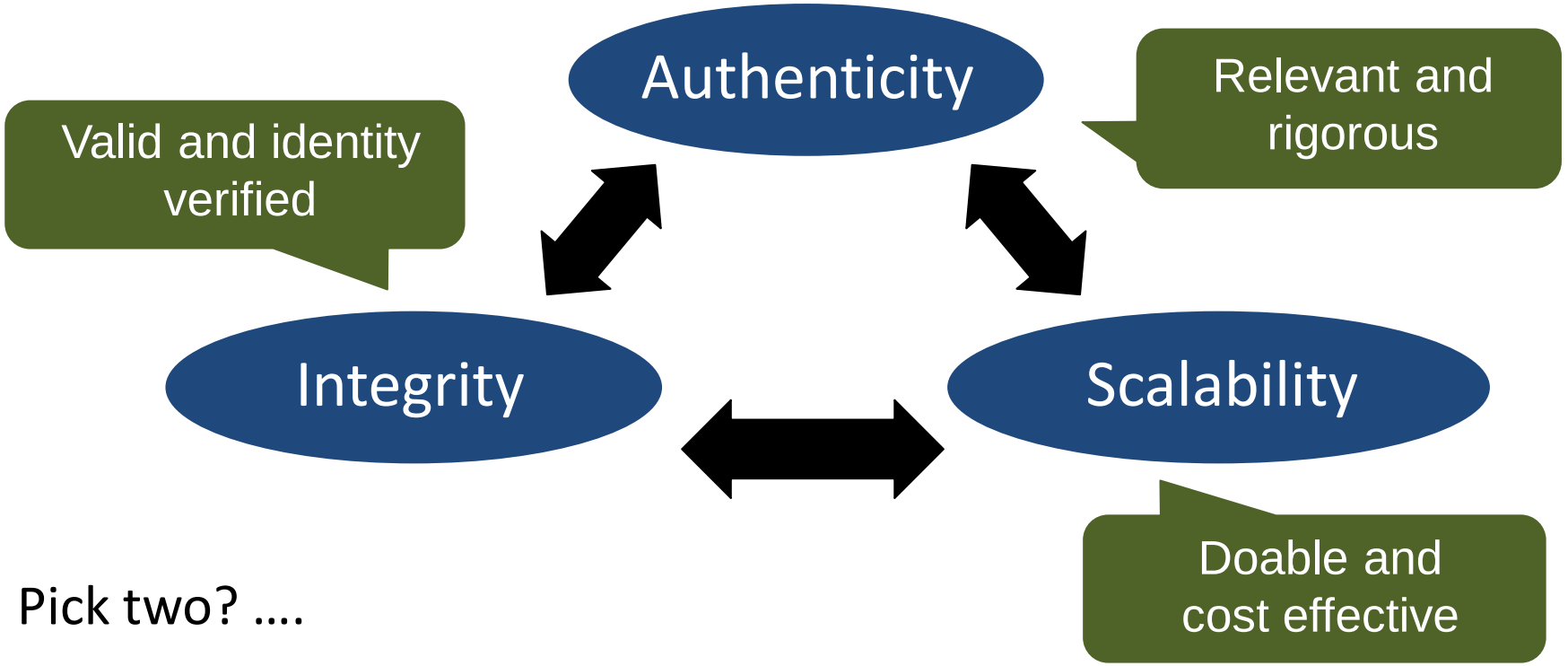
World Economic Forum – How will digital change your working world.
https://agenda.weforum.org/wp-content/uploads/rtr2m8vm1-628x330.jpg

Exams

Exams at Monash Caufield in 2015 (mathew.hilier[at]monash.edu)
70,000 student university

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.

Three dimensions – Good e-Exams



Pick two? ….

We need to strive for all three.

Triad - Requirements

Authenticity:

Enabling a broad pedagogical landscape for the assessment of 21st Century capabilities. Go beyond a 'quiz' paradigm. Use 'tools of the trade' (word processor, spread sheet, database, math, stats, graphics, multimedia, software dev, simulations, CAD, discipline tools). Flexible for open/closed book (restricted online, or isolated offline, e-resources). Data open for analytics.

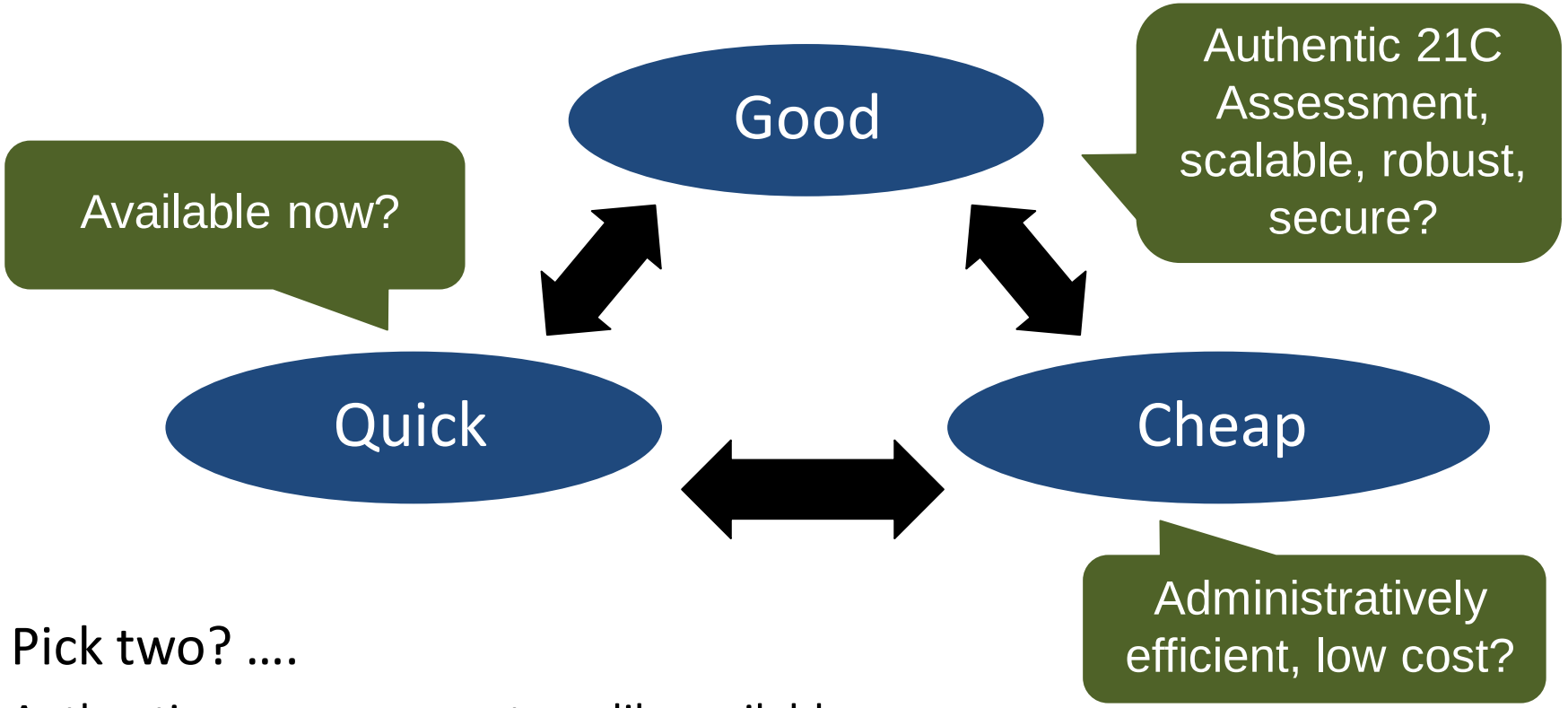
Scalability:

Mix multiple computer marked question types as well as constructed and process problems. Large scale equipment provision ≈ BYOD. Reliable ≠ networks!? = optional.

Integrity:

Supervised environment. Known, consistent and controllable. System wide activity and identity logging. Anti-cheating ≥ paper.

Three dimensions - Which e-Assessment Approach?

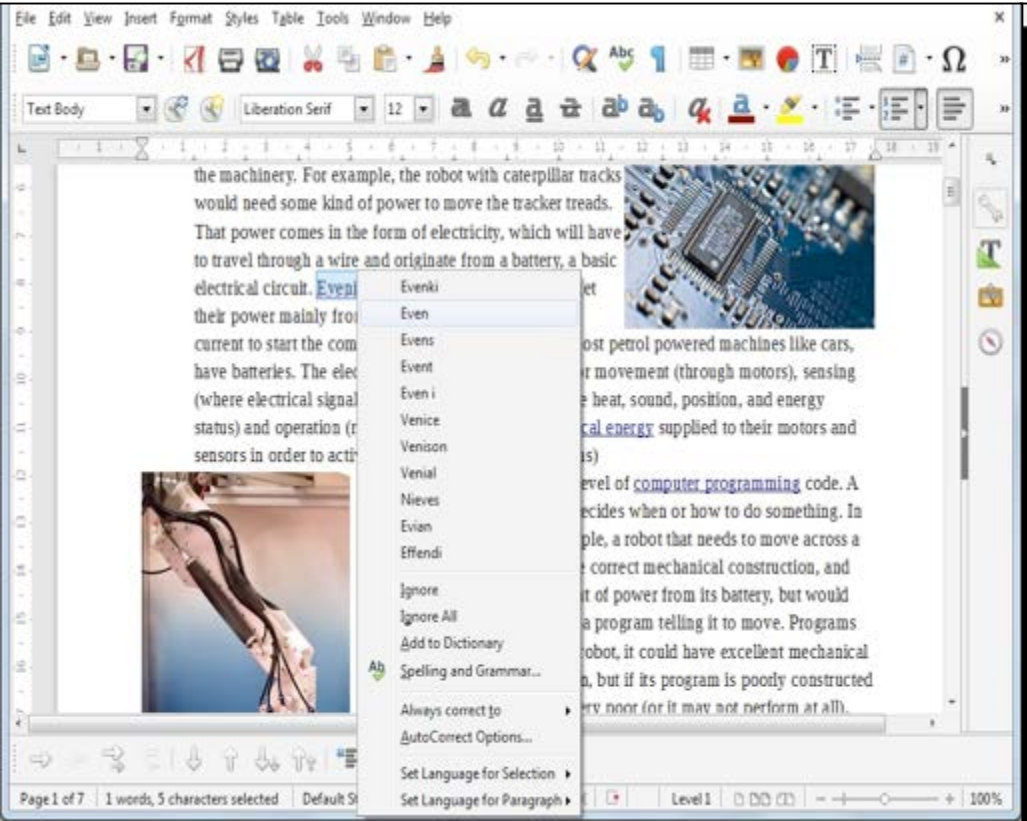


Pick two? ….

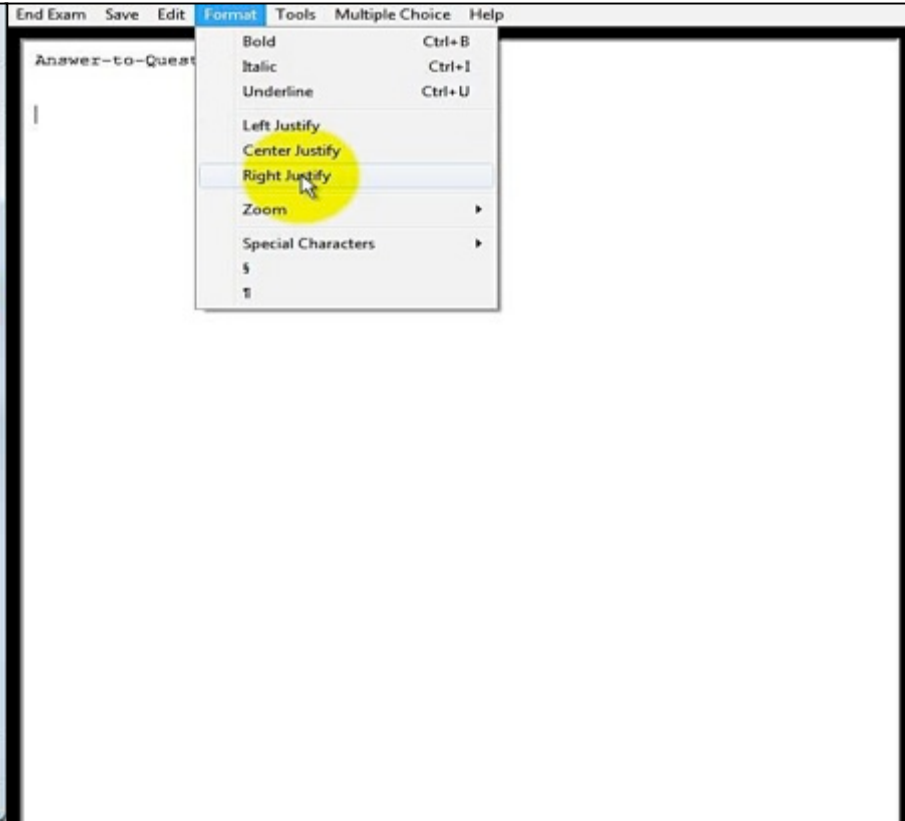
Authentic e-exams are not readily available off-the shelf. Investment and time required.

Writing Tools

Authentic

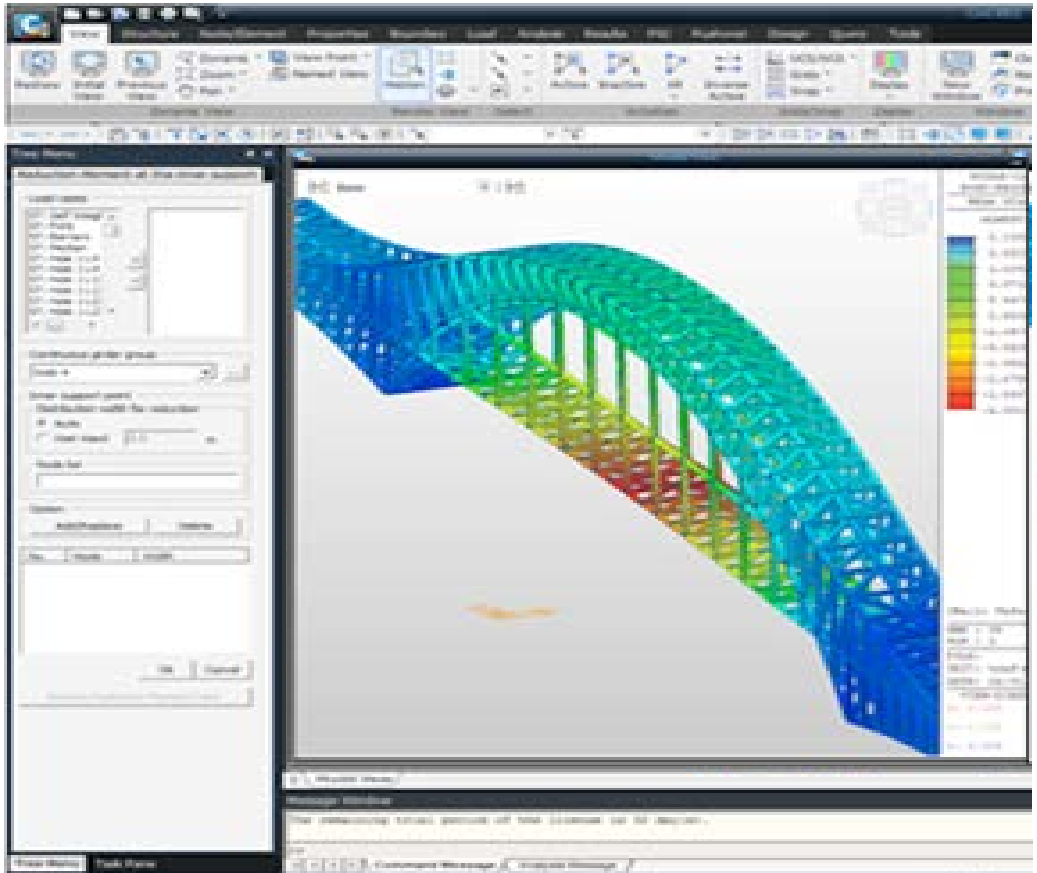


Not



Engineering Problem Solving

Authentic



Not

Question Text

Defining Answers

Place curly brackets "{}" around numeric value(s) requiring blank response field(s). Example: 3*3={9}.

Range: Insert a pipe "|" between a range of values.

Example: The price is {12.2|14.5}. Student answer between 12.2 and 14.5 will be considered valid.

Scientific notation: A period MUST be used as the decimal point marker and the letter "E" or "e" for exponent.

Example: {6.022E23} to express Avogadro's number.

Complex numbers should be in the form (a + bi) where "a" and "b" need to have explicitly stated values.

Example: {1+1i} is valid whereas {1+i} is not. Similarly, {0+9i} is valid whereas {9i} is not.

Acceptable Characters

Only numbers, decimal point markers (period or comma), sign indicators preceding a number (e.g., -5), or spaces (e.g., as thousand separators, 5 000) are allowed within curly brackets. **NOTE:** For scientific notation, a period MUST be used as the decimal point marker.

Any other characters (e.g., $ or %) can be placed outside brackets, if needed. For example: 3/10= {30}%

(Only 30 will need to be entered in the blank response field.)

When defining a range of values, the value preceding the pipe "|" must be smaller than the value after the pipe (e.g., {12.2|14.5}).

Show Rich-Text Editor (and character count)

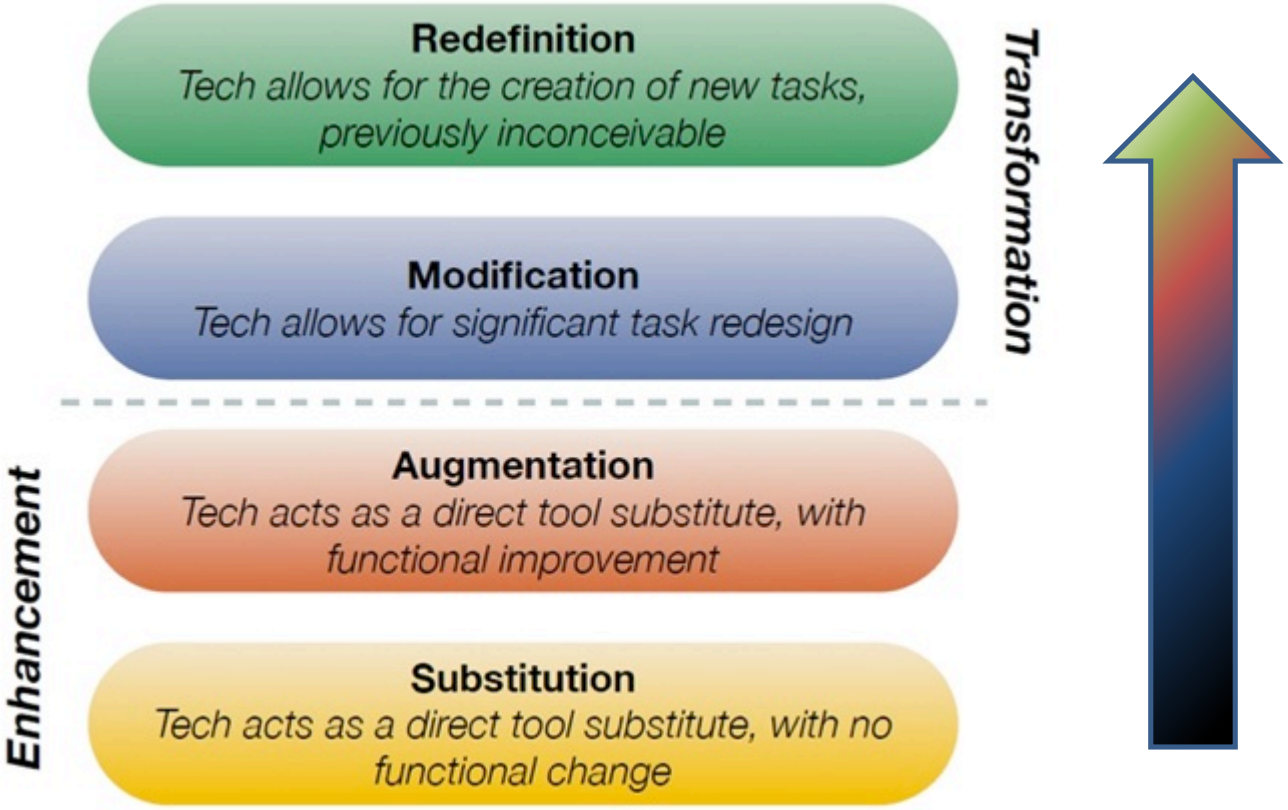
12*15={180}

a) The centre to the boundary

Why e-exams?

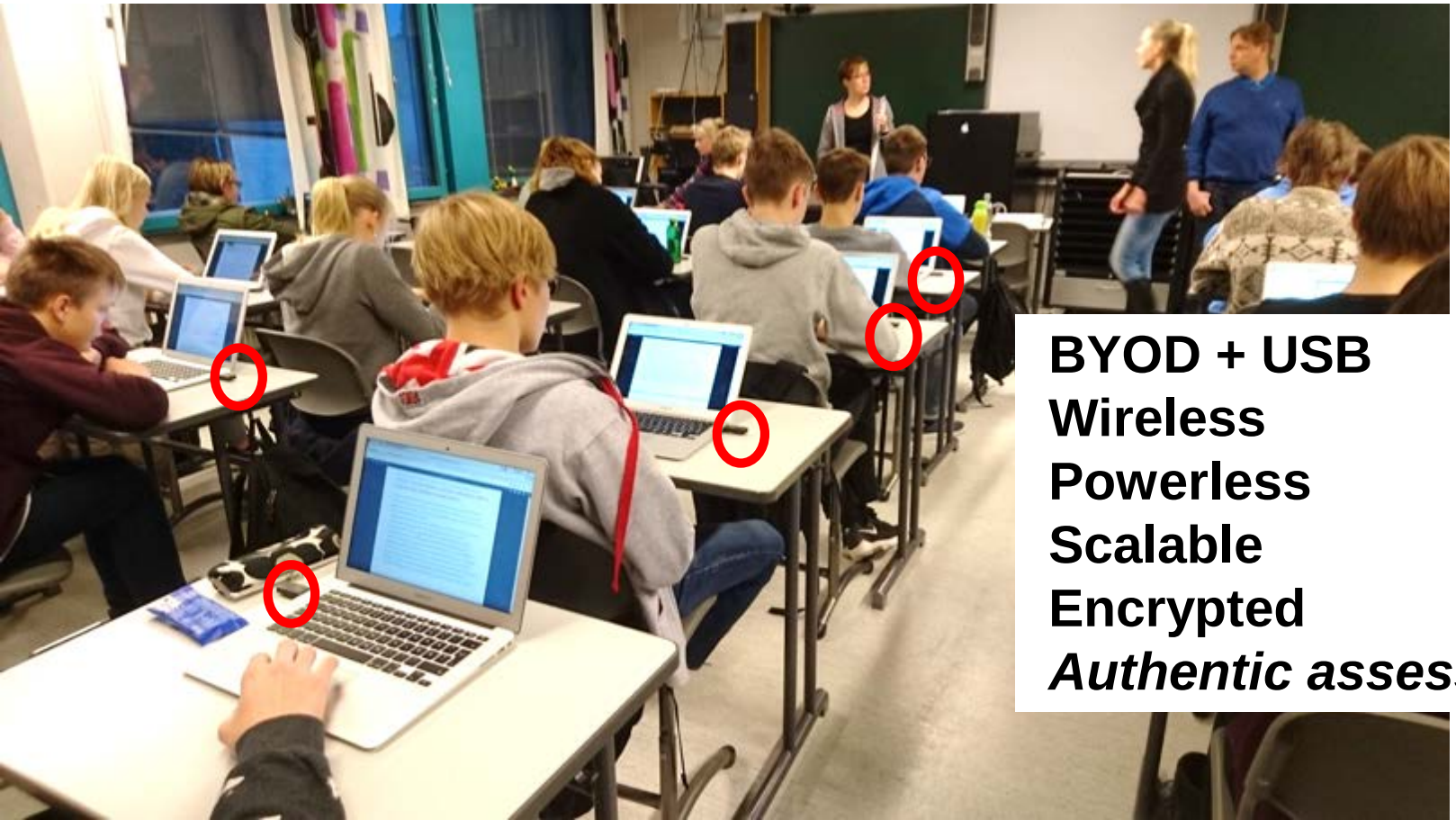
SAMR Model
Substitution
Augmentation
Modification
Redefinition
Ruben R. Puentedura

The value of the ‘e’ in e-exams.



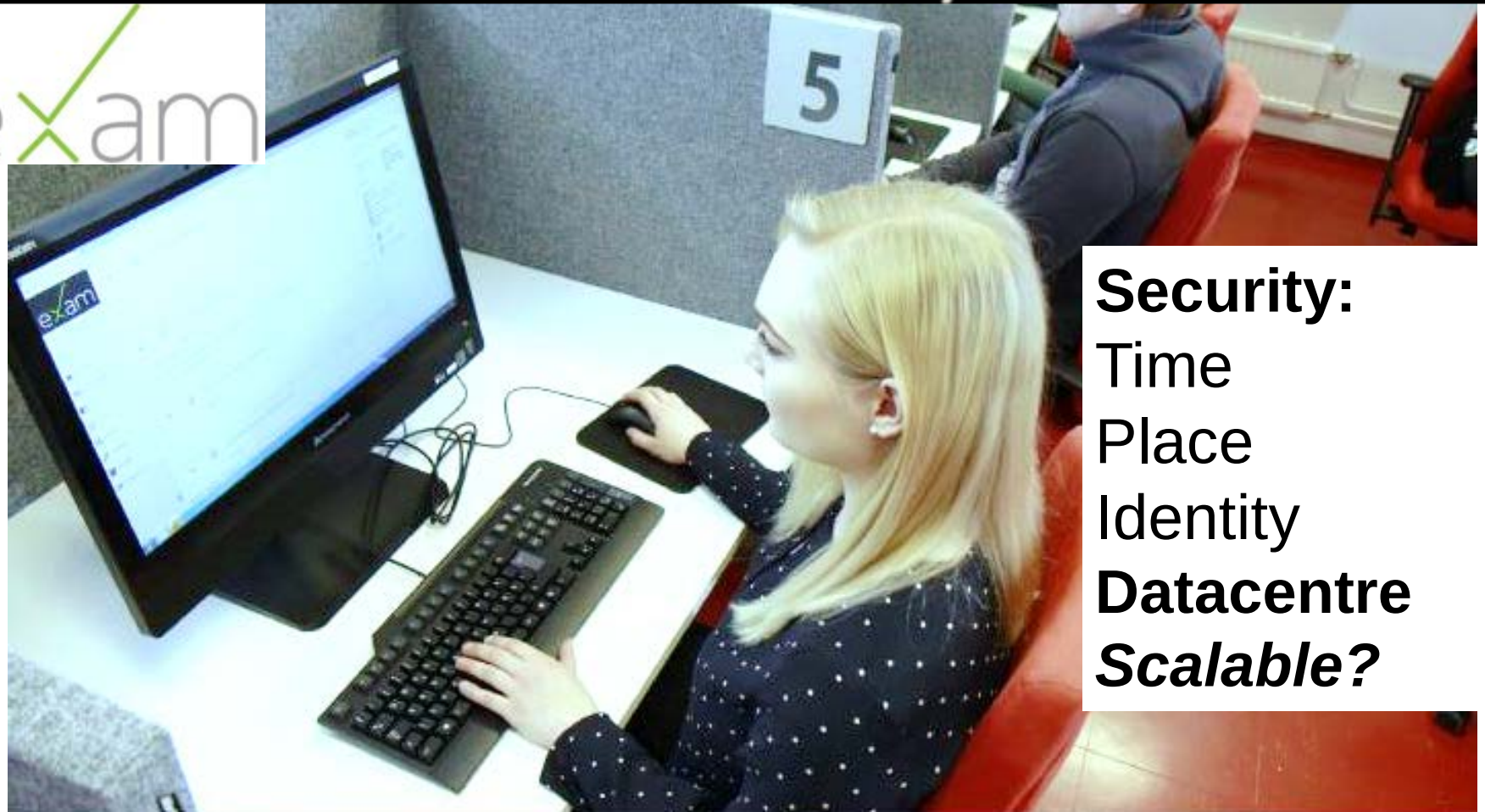
What are others doing?

Finland – School sector – Abitti system



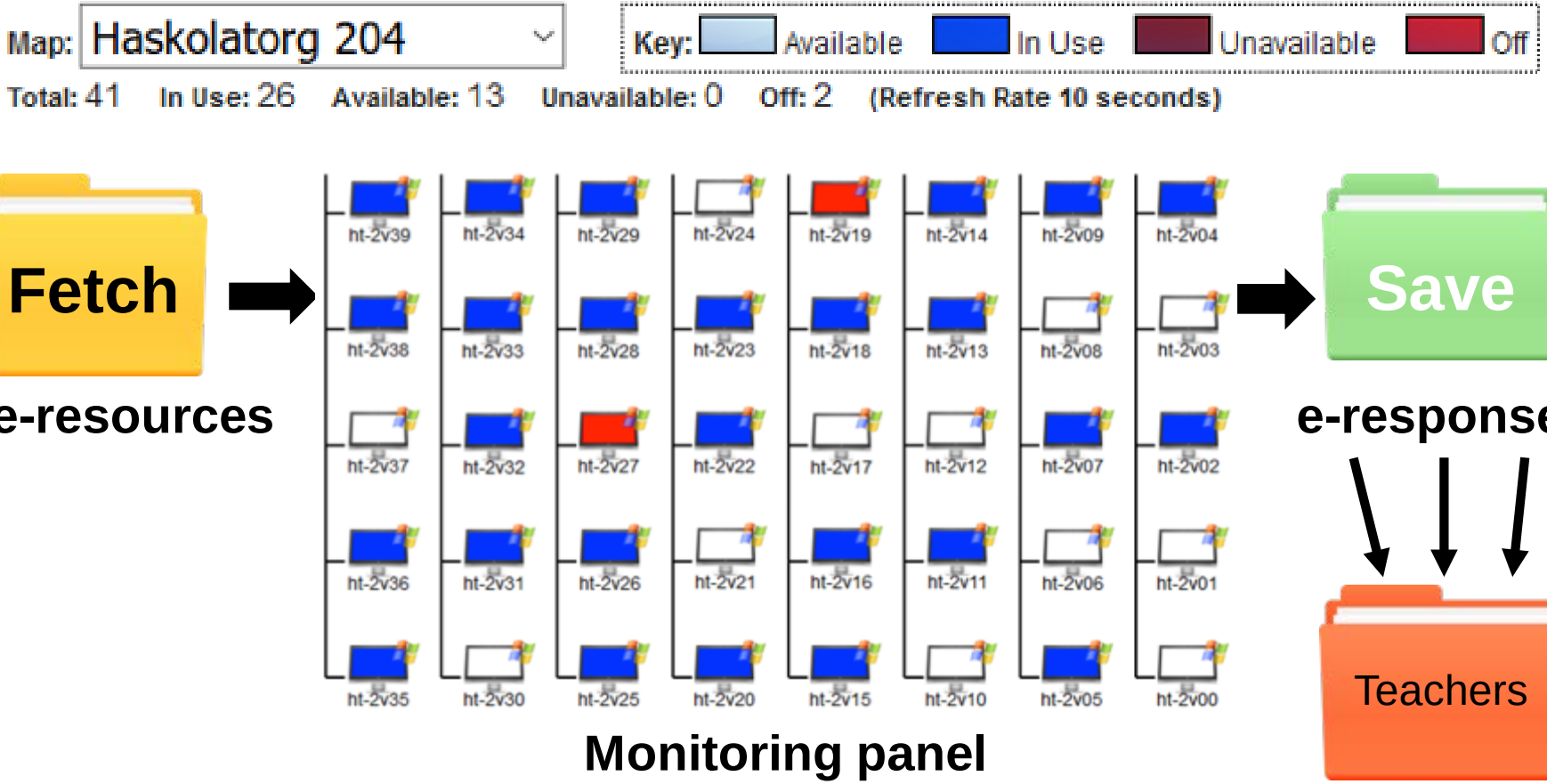
BYOD + USB
Wireless
Powerless
Scalable
Encrypted
Authentic assessments?

Finland – university sector



Security:
Time
Place
Identity
Datacentre
Scalable?

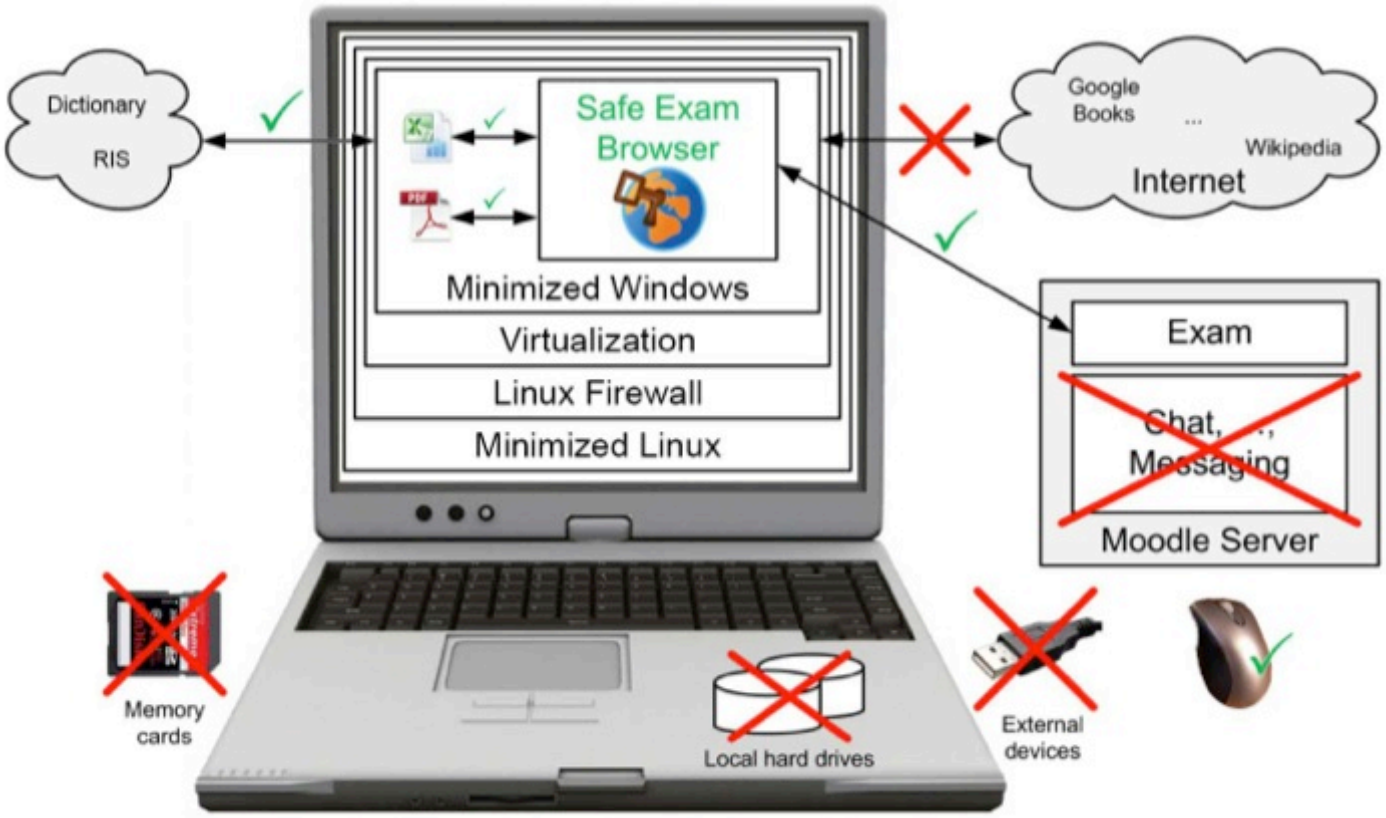
Iceland


Map: Haskolatorg 204
Key: Available In Use Unavailable Off
Total: 41 In Use: 26 Available: 13 Unavailable: 0 Off: 2 (Refresh Rate 10 seconds)
Fetch
e-resources
ht-2v39 ht-2v34 ht-2v29 ht-2v24 ht-2v19 ht-2v14 ht-2v09 ht-2v04
ht-2v38 ht-2v33 ht-2v28 ht-2v23 ht-2v18 ht-2v13 ht-2v08 ht-2v03
ht-2v37 ht-2v32 ht-2v27 ht-2v22 ht-2v17 ht-2v12 ht-2v07 ht-2v02
ht-2v36 ht-2v31 ht-2v26 ht-2v21 ht-2v16 ht-2v11 ht-2v06 ht-2v01
ht-2v35 ht-2v30 ht-2v25 ht-2v20 ht-2v15 ht-2v10 ht-2v05 ht-2v00
Monitoring panel
Save
e-responses
Teachers

Switzerland – Safe Exam Browser (ETH Zurich)

Virtual machine detection
Application locking

Austria – Alpen-Adria university, Klagenfurt



High level network monitor
Communication blocking
Built on SEB

Our e-Exam Project...

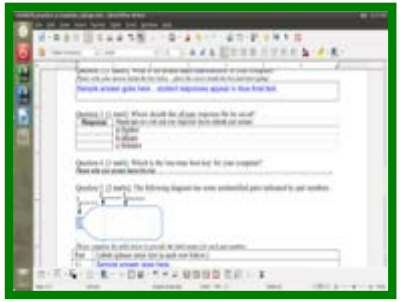
Aim for:

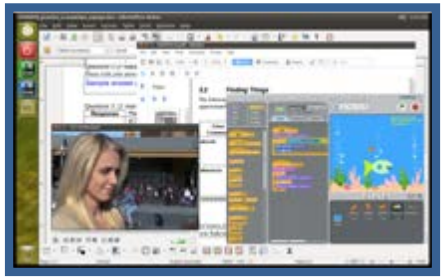
- Supervised
- High stakes
- On campus
- Large scale

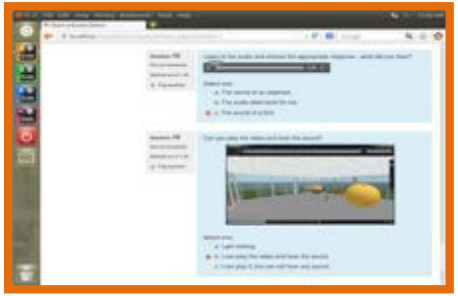
(image credit: Dr Fluck UTAS)

Phased implementation strategy

Start >	> *Current* >	> > >	> > >	> > >	> Future >
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 media landscape.	Medium to large scale. Adding the power of an onboard LMS.	Whitelisted and logged Internet Network BYOD exam.	Open but fully logged Internet Network mixed mode BYOD exam.
	Crawling	**Walking**	**Running**	**Jumping**	**Flying!**





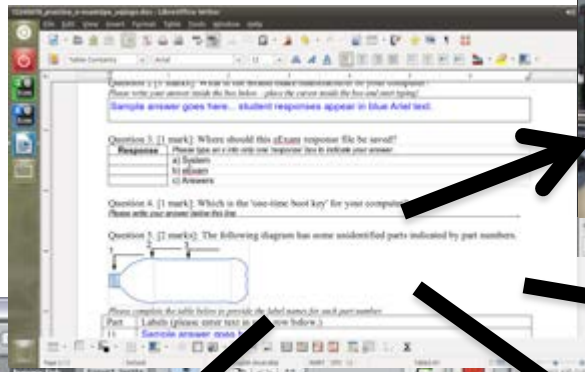


http://ta.vu/e-exam-roadmap

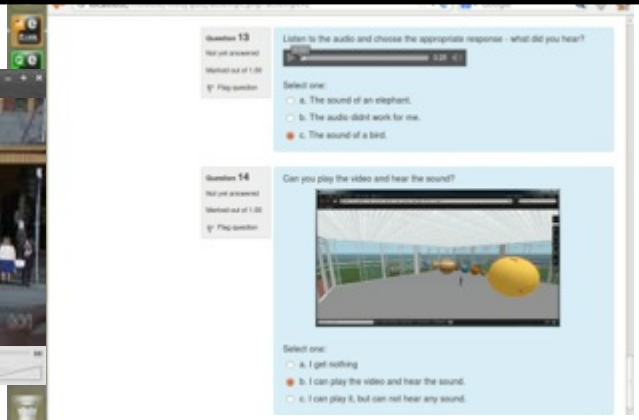
Post-paper: e-tools

It is a platform, not an app! ~ e-tools of the trade.

Start! Exam doc

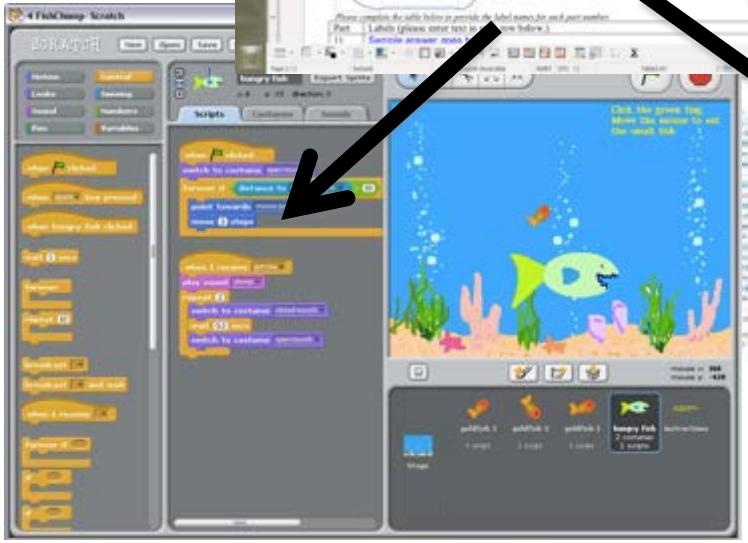


Video



On-board LMS quiz

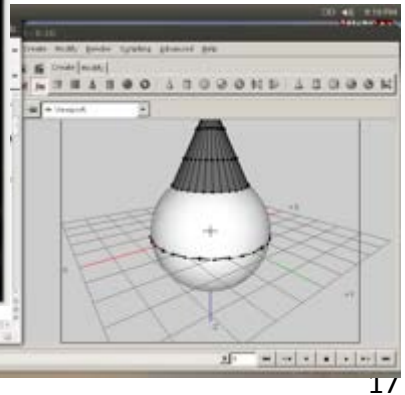
Scratch SDK



PDF

Specialist applications

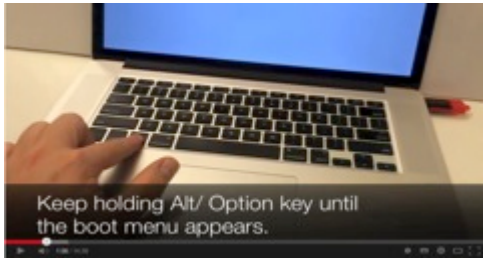
Sims



e-Exam Project Resources

More information….

http://transformingexams.com



Demo videos start-up, use and recovery examples.

E-Exam project contact: mathew.hillier[at]monash.edu

Cite this resource

Hillier, M & Fluck, A (2017) The assessment triad and e-exams: authenticity, integrity and scalability. Assessment integrity and the role of exams, 22 Aug 2017, Melbourne.