



TRANSFORMINGEXAMS.COM

A Scalable Examination Platform for BYOD Invigilated Assessment

Student experiences with a bring your own laptop e-Exam system in pre-university college

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Get this paper <http://ta.vu/occe40>

Matching paper <http://ta.vu/occe41>



Australian Government
Department of Education and Training



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South Australia

A key motivation - The gap

Real world of work



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

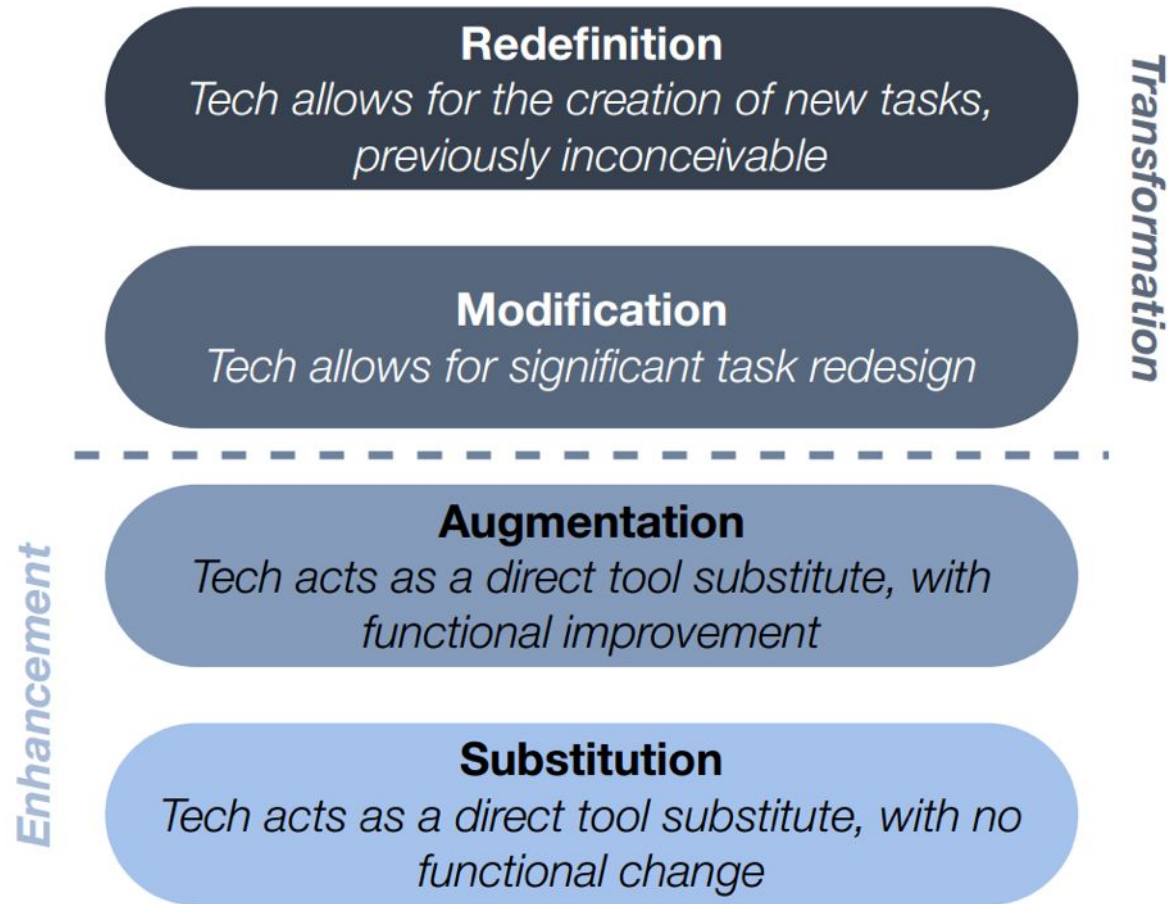
Exams



Exams at Monash Caulfield 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.

What we are doing about it...



SAMR Theory - Puentedura, 2012

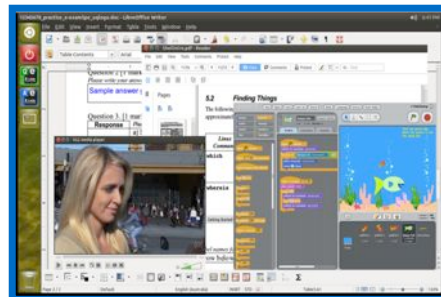
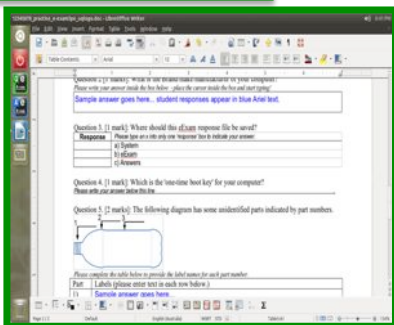
Study context - broader e-Exam project

Start >	>>>	>>>	>>>	>>>	>>>	> 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 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!	

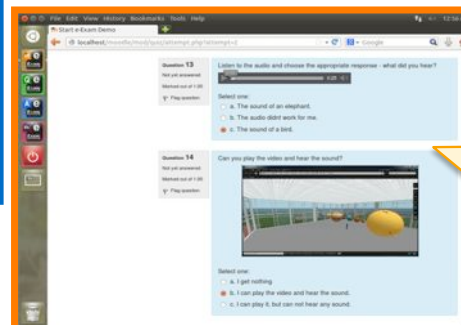


This paper!

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



Extension work:
An offline e-learning platform see moleap.org



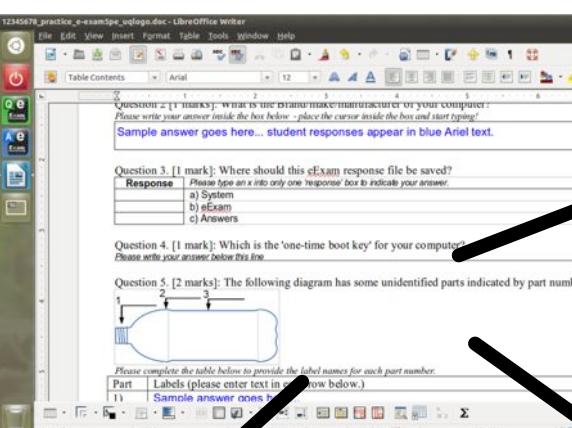
Thursday demo!
Moodle resistant to network outages!

Pedagogical Affordances

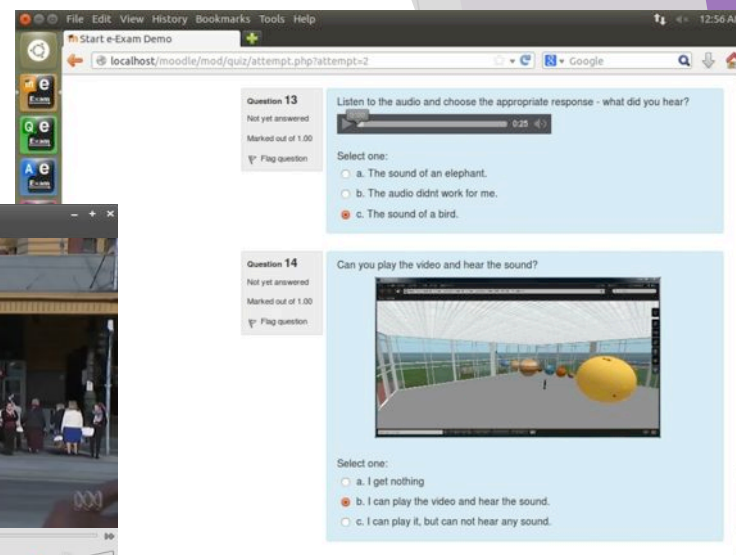
Authentic assessments. It is a platform, not an app!



Exam doc

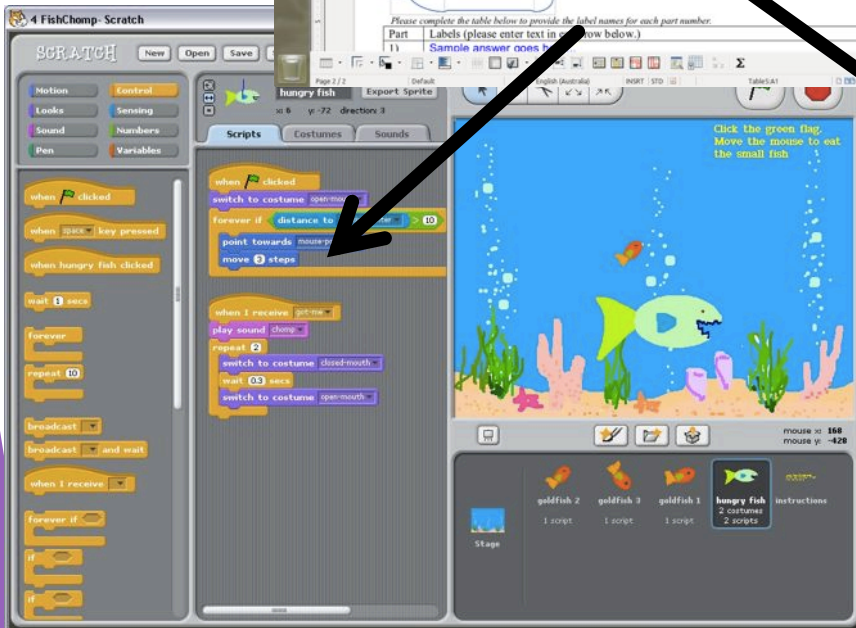


Video



LMS quiz

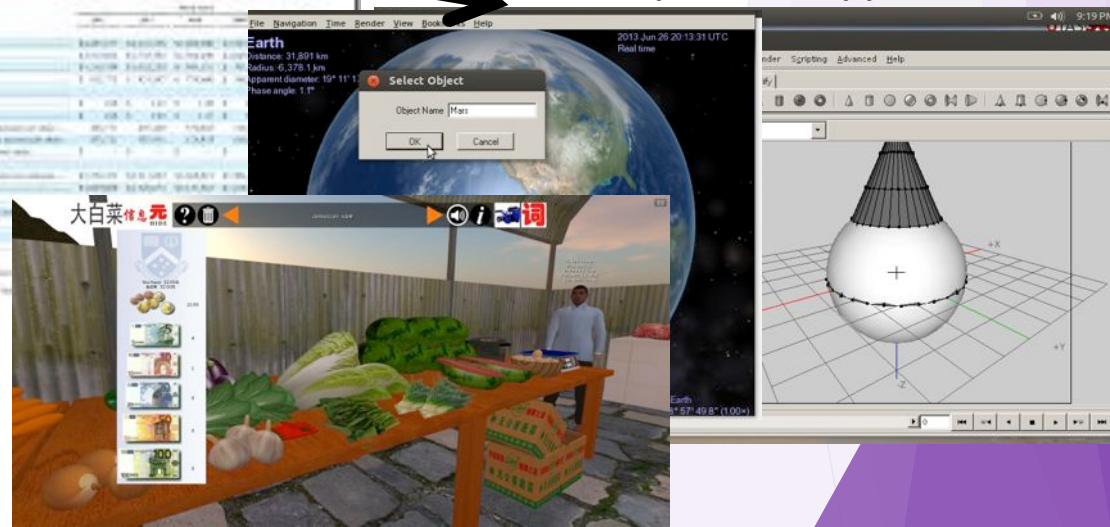
Scratch SDK



Specialist applications

PDF

Sims



e-Exam system (offline mode used in this study)

Pre-exam: prepare learning materials



1. Teacher creates exam, media, Moodle content, etc

2. Create master USB (load exam, configure, test)



3. USBs duplicated

5. Pre-session:

Student laptop setup & practice.



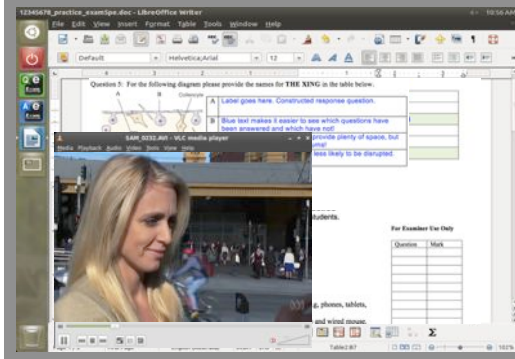
4. USBs sent to exam venue



*Linux
Live USB.
Libre Office.
Question paper.*

6. Exam venue:

- Students enter room
- Given USB
- Start laptop from USB
- Do exam
- Finalise and shutdown
- Return USB
- Leave room



7. Manual return

8. Responses retrieved from USBs.



Post-exam: assessment

9. Collated e-responses sent to teacher.



10. Return feedback to student.

USBs can be recycled next exam.



Study context - e-Exam Project trials

	2017 University [pre-university]	2018 University
Monash	<ul style="list-style-type: none"> • Geography x 3 classes [Monash college 2016] • Business Statistics • Language Translation (some NAATI) • Globalisation x 4 classes [Monash college 2017] • Introductory Chinese language (offline, Spreadsheet used as a form) • Language Translation 	<ul style="list-style-type: none"> • Language Translation • Introduction to Chinese (in 'Robust' Moodle LMS). • Chinese online media (in 'Robust' Moodle LMS).
UQ	<ul style="list-style-type: none"> • French language translation 	French language
CQU	<ul style="list-style-type: none"> • Knowledge Management Principles (IT) • Ethics and Social Issues (IT) 	IT management
UTAS	<ul style="list-style-type: none"> • Education 	Environmental Chemistry
MqU	<ul style="list-style-type: none"> • ICT in Education 	
UNSW	<ul style="list-style-type: none"> • Air power (ADFA) 	
ECU	<ul style="list-style-type: none"> • Teaching Introductory Computer Programming • OHS for trades 	
UniSA	<ul style="list-style-type: none"> • Science & Math for secondary teaching x2 	Math for secondary teaching

Items **marked in purple** for this presentation (paper 40 and also 41).

Items **marked in red** - we will talk about these at our Thursday demonstration!

Research Questions

Area	Example research questions
Intention and attitude	Were candidates in favour of the e-Exam system? Would they recommend it to others or use it again? Did they have any concerns about undertaking an e-exam? If they typed their exam, was their attitude changed or any concerns lessened following the event?
Ease of use	Were the students able to use the system with relative ease? Did they have any issues related to the e-exam processes?
Technical reliability	Did any technical issues or interruptions arise? If so, did such issues interfere with the exam or result in lost work?

* Note this study should be read in conjunction with our other paper!

Participation

128 pre-tertiary students.

Two units (subjects):

Geography and Globalisation

Sample: 65% female and 35% male.

52% of students chose to type.

**Caveat: Not random samples -
descriptive of these groups only.**



e-Exam Process

Geography & Globalisation

Students could choose to type or handwrite.

- 1) Two weeks prior: practice session and pre-survey.
- 2) Exam day: In-class, graded, supervised assessment task.

Materials provided on paper & as a word processor document. Included photos, diagrams, charts and data tables.

- **Geo 2016:** the assessment task was a single case study with an extended essay response.
 - **Glo 2017:** two short answer sections and a mini-case essay response
- 3) Students then completed a post-exam survey before leaving the room.

Details of e-Exam Room Set-up and Procedure

Room set up:

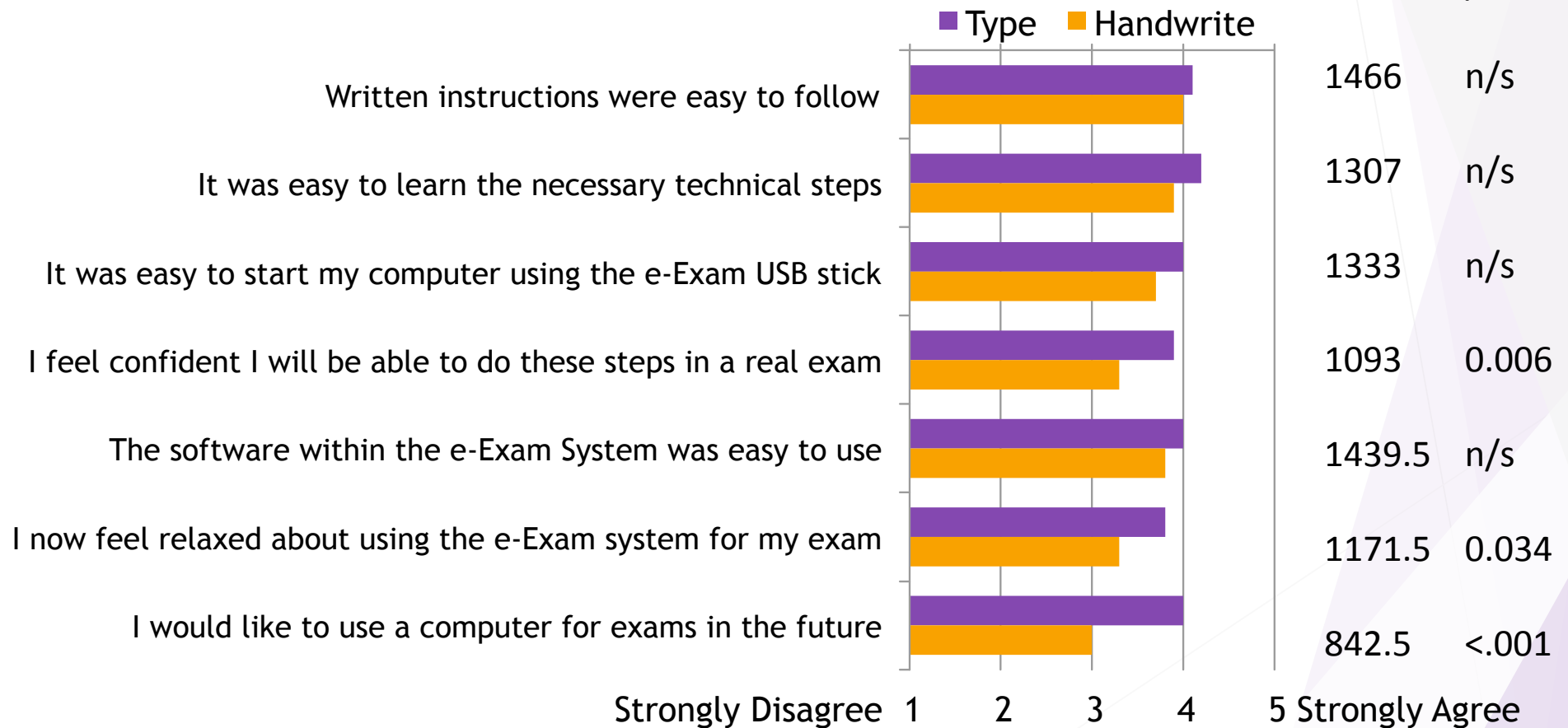
- ◆ Paper 'e-Exam quick start guide' and post-exam survey.
- ◆ A power socket was provided for each typist.
- ◆ Hand-writers were given a paper copy of the exam questions and response booklets. These were available to typists upon request.

Both typists and hand-writers sat in the same room.

- ① Students enter the room and were seated at a suitable desk.
- ② Typists were given an e-Exam USB stick containing the questions.
- ③ Students start their computer with a USB stick progressing to the e-Exam desktop. A desktop background image provides a visual check that all have booted from the correct USB.
- ④ Invigilator announces the start of the exam. Students enter their student ID and name into the starter screen. The system then opens the exam document. Auto-save occurs every two minutes.
- ⑤ At the end of the exam, the student saves their work one last time and shuts down the computer.
- ⑥ Students return the USB sticks containing their responses.
- ⑦ Students complete the post-exam survey before leaving the room.

Findings: Intentions and Usability

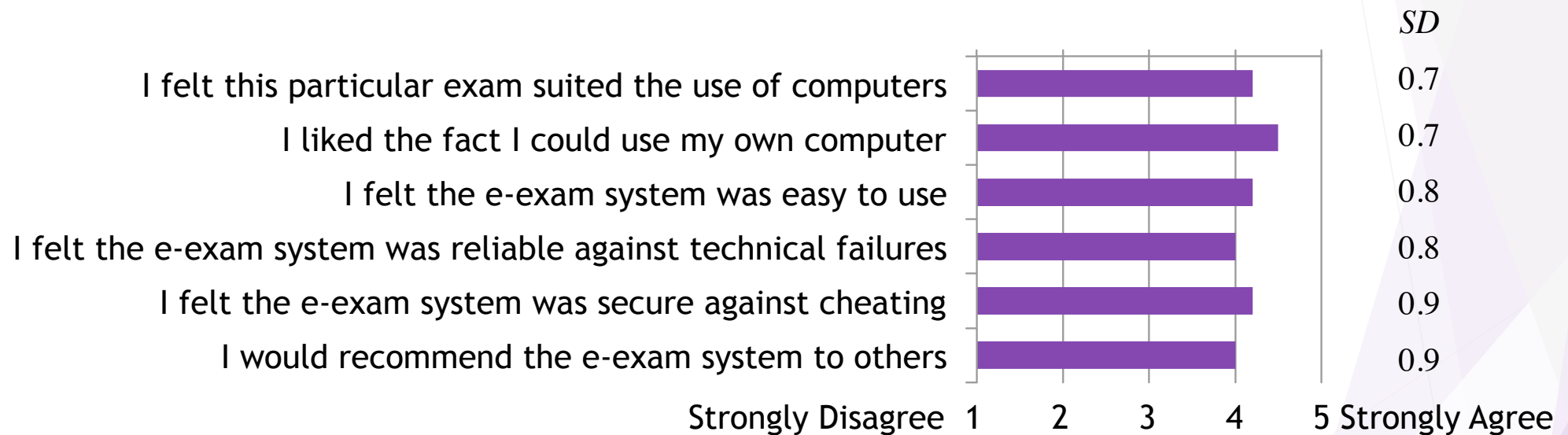
Pre-exam survey responses -> exam mode choice
(n= 55 typed and 56 handwrote)



Caveat: Not random samples - descriptive of these groups only.

Findings: Typist's Opinions of e-Exam system

Post-exam survey responses regarding the e-Exam system (n=63).
Opinions were consistently positive with small standard deviations.

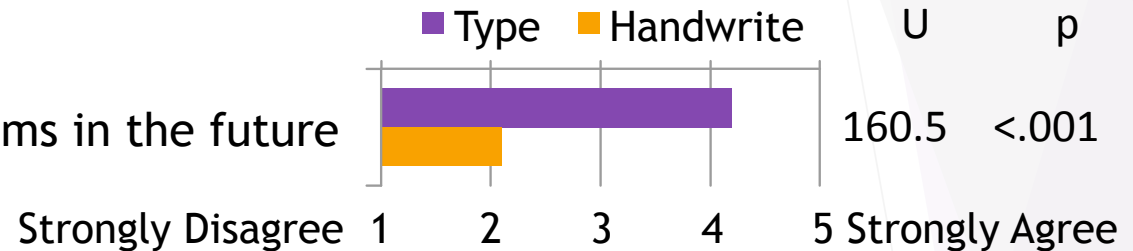


Caveat: Not random samples - descriptive of these groups only.

Findings: Pre-to-Post -> Future intention

Post exam result:

I would like to use a computer for exams in the future



Did future intentions change between pre and post exam?

Typists: Pre ($n=55$, $M=4.0$, $SD=1.0$). -> Post ($n=61$, $M=4.2$, $SD=0.7$)

Wilcoxon Signed-Ranks test: A positive but not significant change.

Hand-writers: Pre ($n=56$, $M=3.0$, $SD=1.2$) -> post ($n=53$, $M=2.1$, $SD=1.0$)

Wilcoxon Signed-Ranks test: Significantly more negative following the exam.

Overall - opinions tended to 'harden'.

Caveat: Not random samples - descriptive of these groups only.

Summary - Key Findings

a) **Typists were positive about the experience and became more so having done an e-exam.**

The e-Exam system was rated well by the typists: 4+ out of 5.

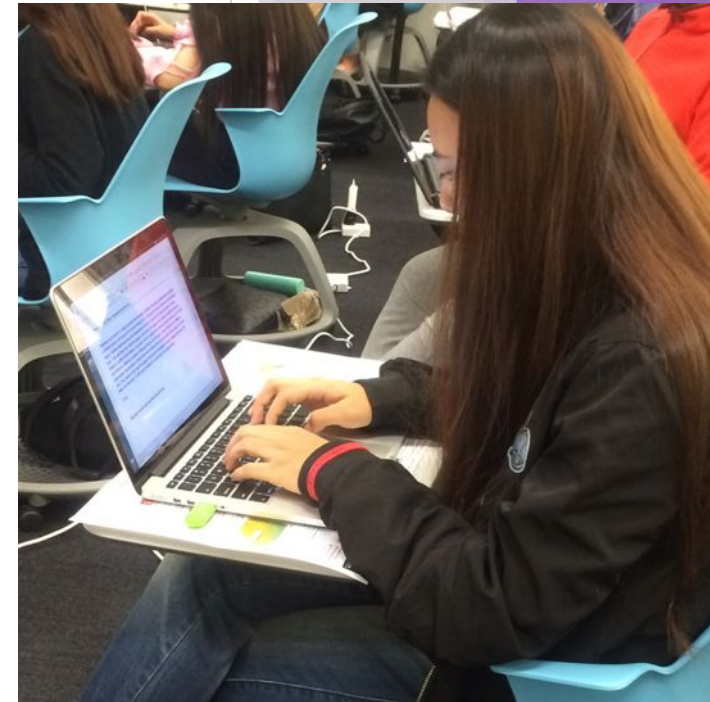
b) **Opinions on using computers for exams tended to harden either 'for' (by typists) or 'against' (by hand-writers).**

c) **Impact of student choice on typing or handwriting:**

+ **Lessen the stress.**

- **Limited the degree of task sophistication.**

This can only ever be a temporary state of affairs if we want to progress up the SAMR ladder to include re-designed, higher order assessment tasks that assume sophisticated tools will be available. I.e. our 'Phase 2' and beyond.



Thank you

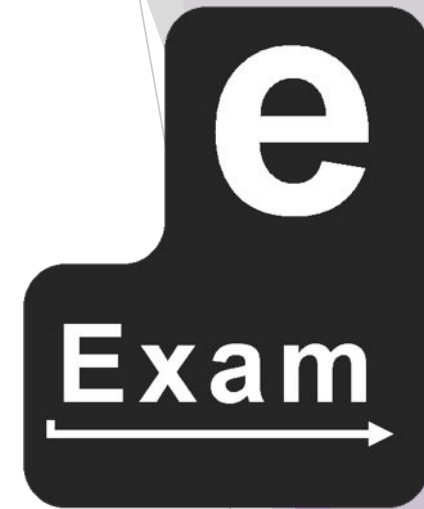
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TransformingExams.com

eExamSymposium.eventbrite.com.au

24 Nov, Melbourne, Australia.



Our presentations at OCCE 2018:

1. Writing e-Exams in Pre-university College. Full text <http://ta.vu/occe41>
2. Student experiences with a bring your own laptop e-Exam system in pre-university college. Get full text <http://ta.vu/occe40>
3. **Thursday FPS 8.1 (10:30 - 12:00)**
Mathew Hillier (AU), Andrew Fluck:
Robust networked e-Exams with Moodle ~ demo!
Get abstract <http://ta.vu/occe42>