

# e-Exams: 2014 UQ Trial Outcomes

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<http://transformingexams.com>

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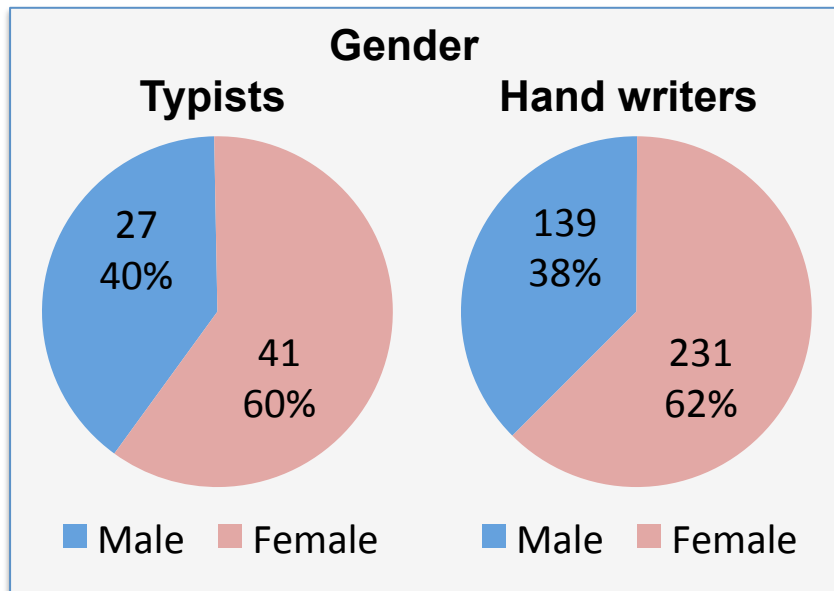


# UQ e-Exam Trial Outcomes 2014

## Data collected from students (S1 & S2 2014)

- Via pre-exam project online survey (UQ wide): See Hillier & Tran (2014).
  - UQ students surveyed about their preconceptions about e-exams.
  - [http://transformingexams.com/files/HERDSA\\_special\\_presentation\\_july\\_2014\\_pre\\_survey-final\\_version.pdf](http://transformingexams.com/files/HERDSA_special_presentation_july_2014_pre_survey-final_version.pdf)
- Via pre-exam short survey (six courses - not shown here).
  - Conducted at the pre-exam practice setup sessions.
  - Covered: student preliminary impressions, technical hardware compatibility.
- Via post-exam extended survey (**six courses - main results follow**)
  - Conducted at the conclusion of the exam (in the room).
  - Covered: rationale, student exam experience, reaction to exam session conditions, e-exam system impressions, exam writing strategies and production, general non-exam writing strategies.
  - [http://transformingexams.com/uq\\_trials/e-exams\\_2014\\_trial\\_results\\_sept.pdf](http://transformingexams.com/uq_trials/e-exams_2014_trial_results_sept.pdf)
- Future analysis – production (words, language density, marks).

Participation across the six courses in the trials		Typed	Handwrote
ANIM	Animal Biology: 45 min mixed short answer and MCQ (type 'x')	5	109
BIOL	Zoology (BIOL): 50 min short answer (Multiple choice section done pen on OMR sheet)	10	81
CRIM	Criminology: 70 minutes. Single long essay response section (and a Multiple choice section done pen on OMR sheet)	17	50
OCTY	Occupational Therapy: 100 min mixed short answer and MCQ (type 'x')	3	24
PHTY	Physiotherapy: 15 min (watch video and write) before OSCE	25	108
VETS	Veterinary technology: 90 min theory, mostly short answer	11	78
		71	450



It is important to note:

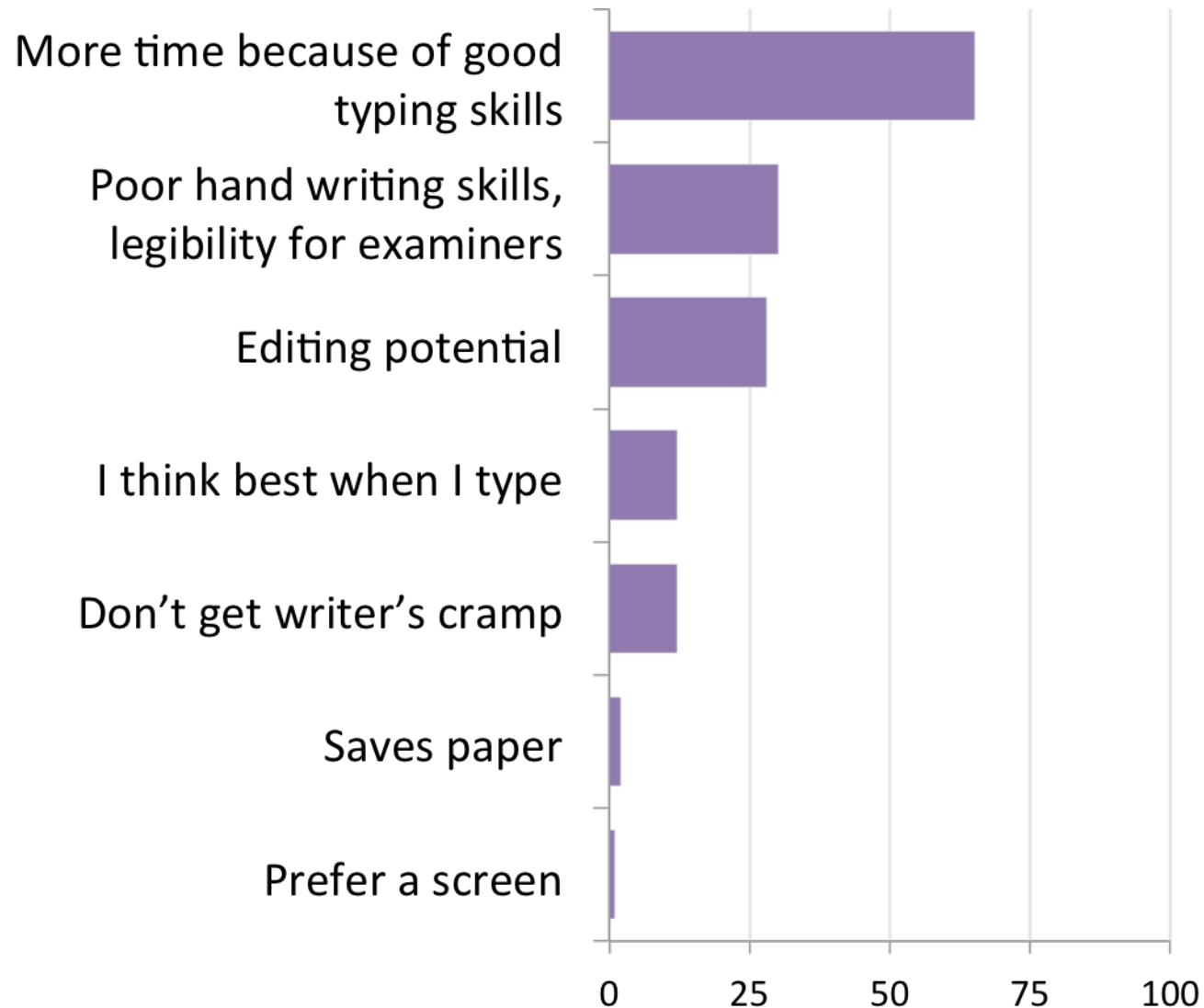
- First 'toe in the water' trials.
- Participation was optional.
- Mid term exams worth an average of 15% of the course grade.

Detailed case descriptions available:

[http://transformingexams.com/uq\\_trials/UQ\\_e-exam\\_cases\\_s1\\_and\\_s2\\_2014.pdf](http://transformingexams.com/uq_trials/UQ_e-exam_cases_s1_and_s2_2014.pdf)

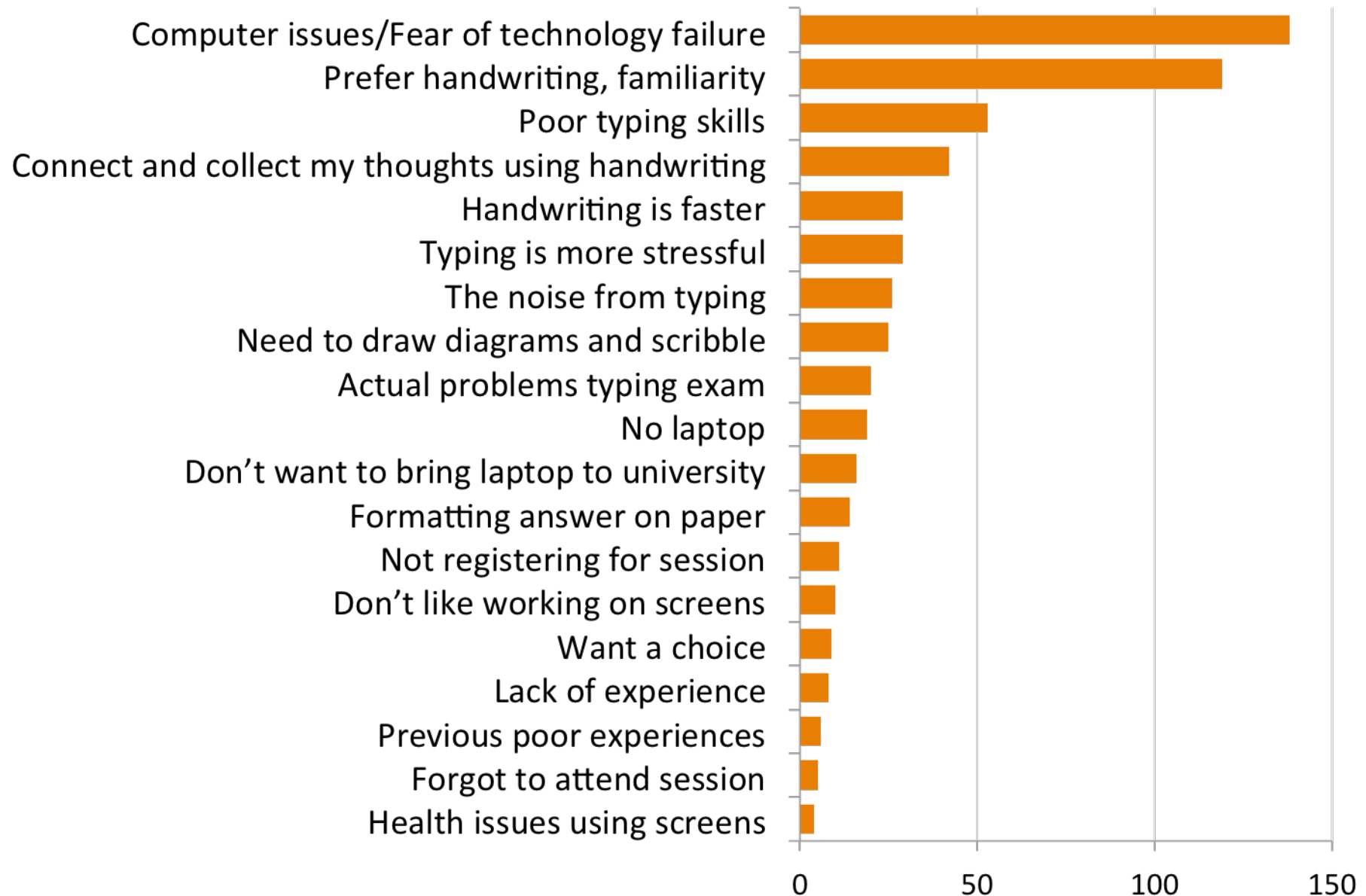
# Reasons for typing the exam

(added 30 October 2014)



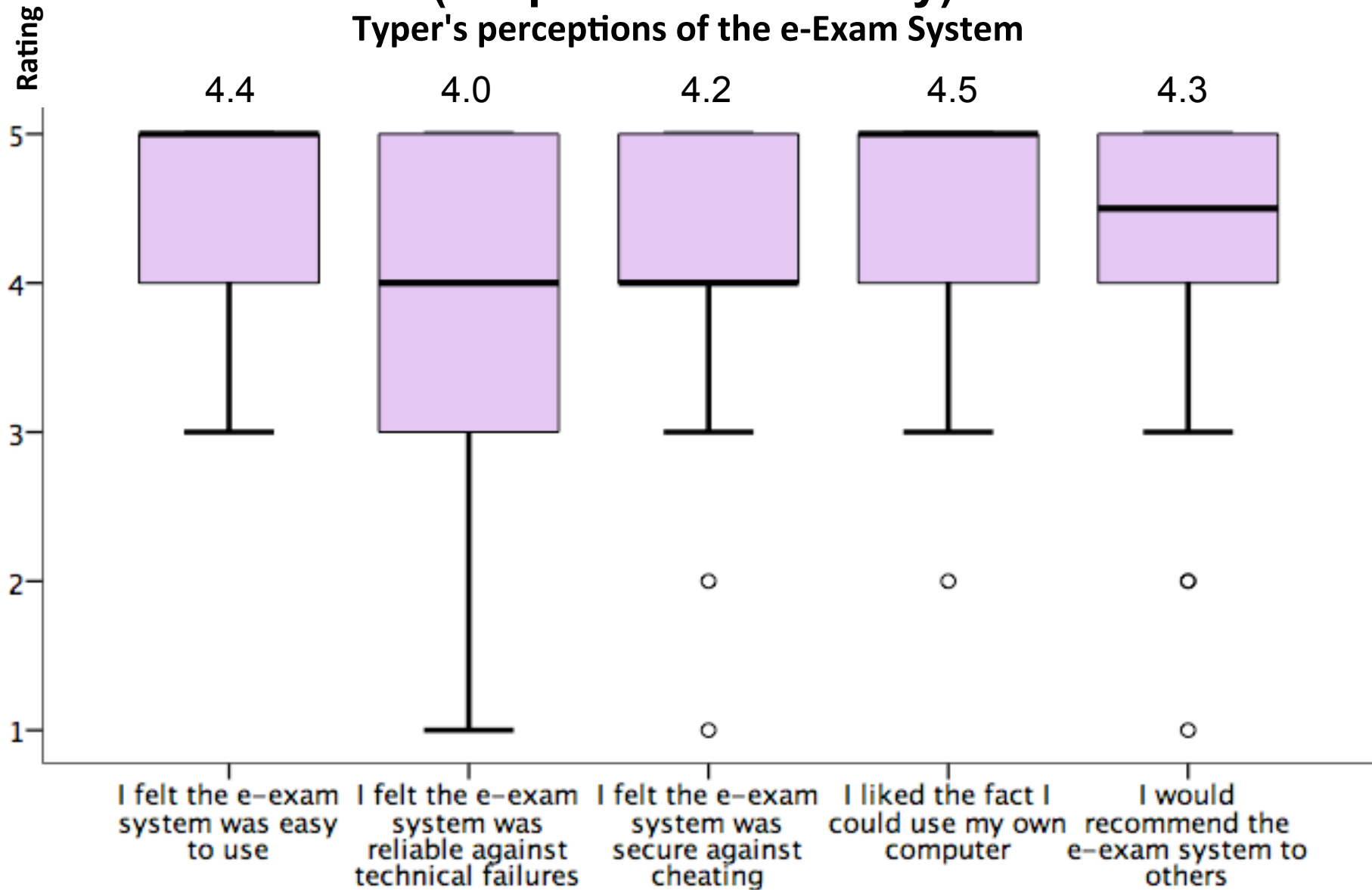
# Reasons for handwriting the exam

(added 30 October 2014)



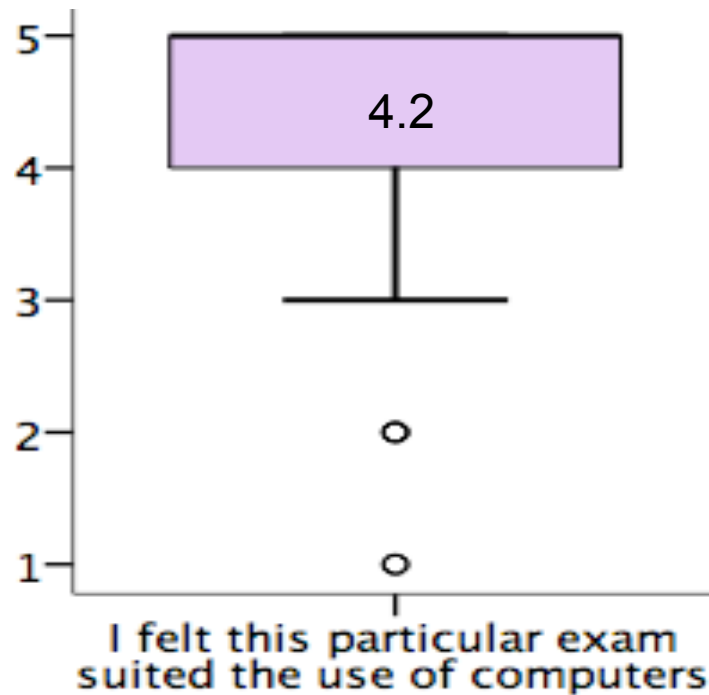
# Reported by those that used the system (via post-exam survey)

## Typers's perceptions of the e-Exam System



Likert scale/rating: 1 = strongly disagree to 5 = strongly agree [N = 69]. Means shown.

# Did typers think the exam suited the use of computers?

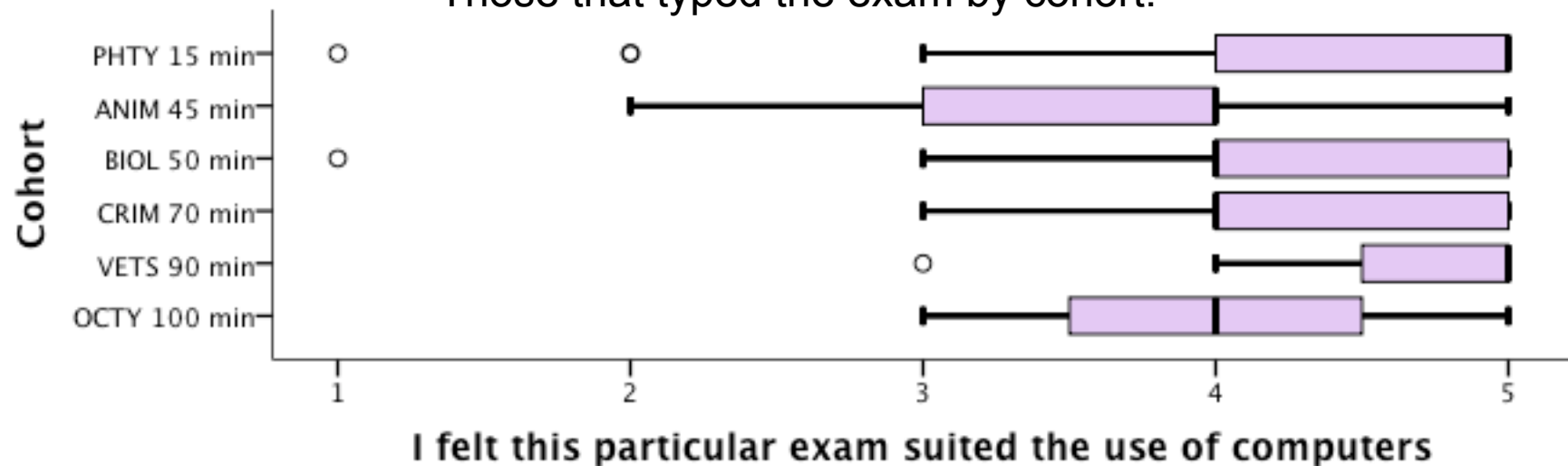


Those that typed the exam.  
All six cohorts combined (ANIM, BIOL, CRIM, OCTY, PHTY & VETS).  
Likert Scale: 5 = Strongly Agree, 1 = Strongly Disagree

Mean of 4.2 (value shown) N = 69.

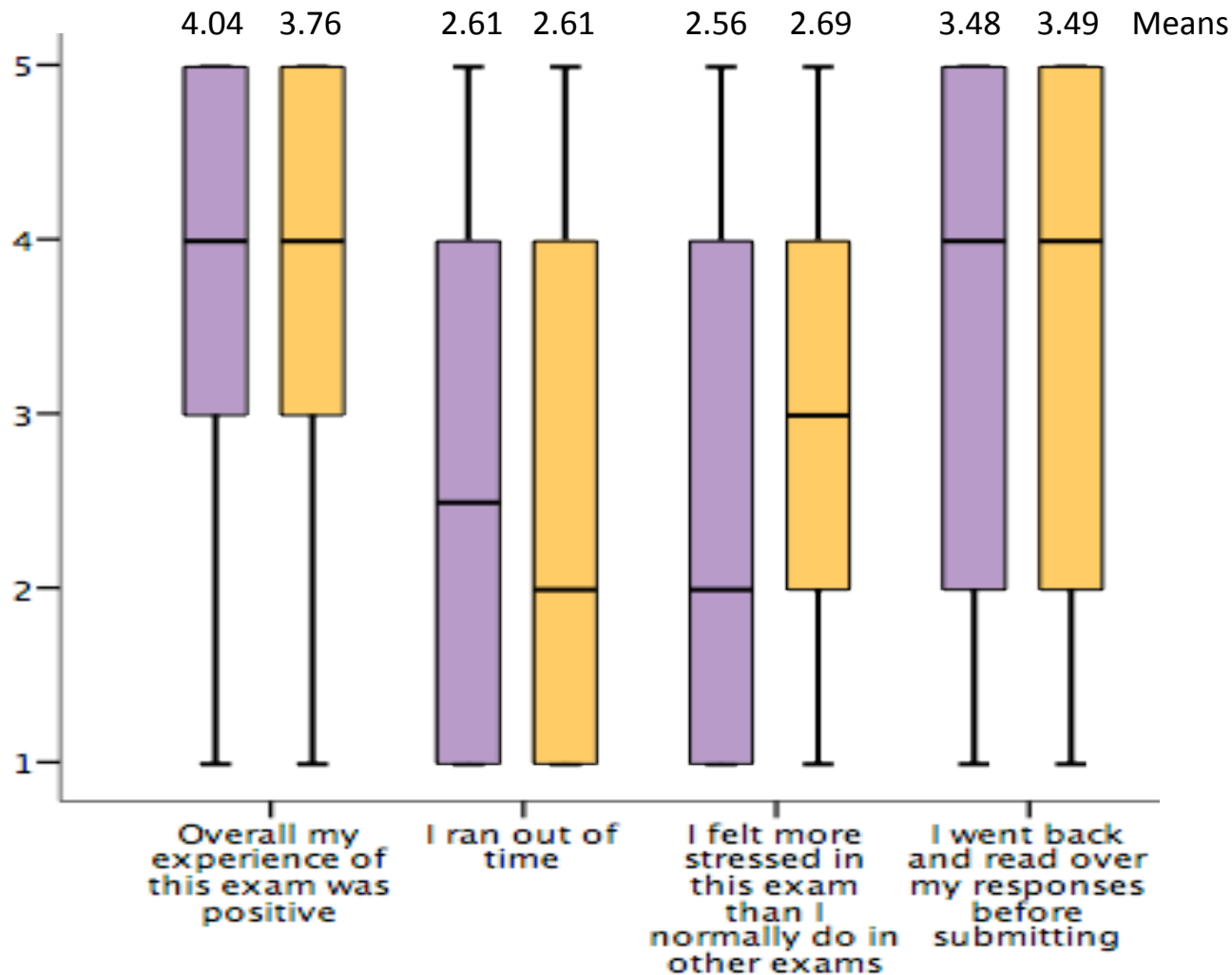
Largely that was a 'yes'.

Those that typed the exam by cohort:



# Student reaction to exam conditions

## Typers (left) and Hand writers (right)



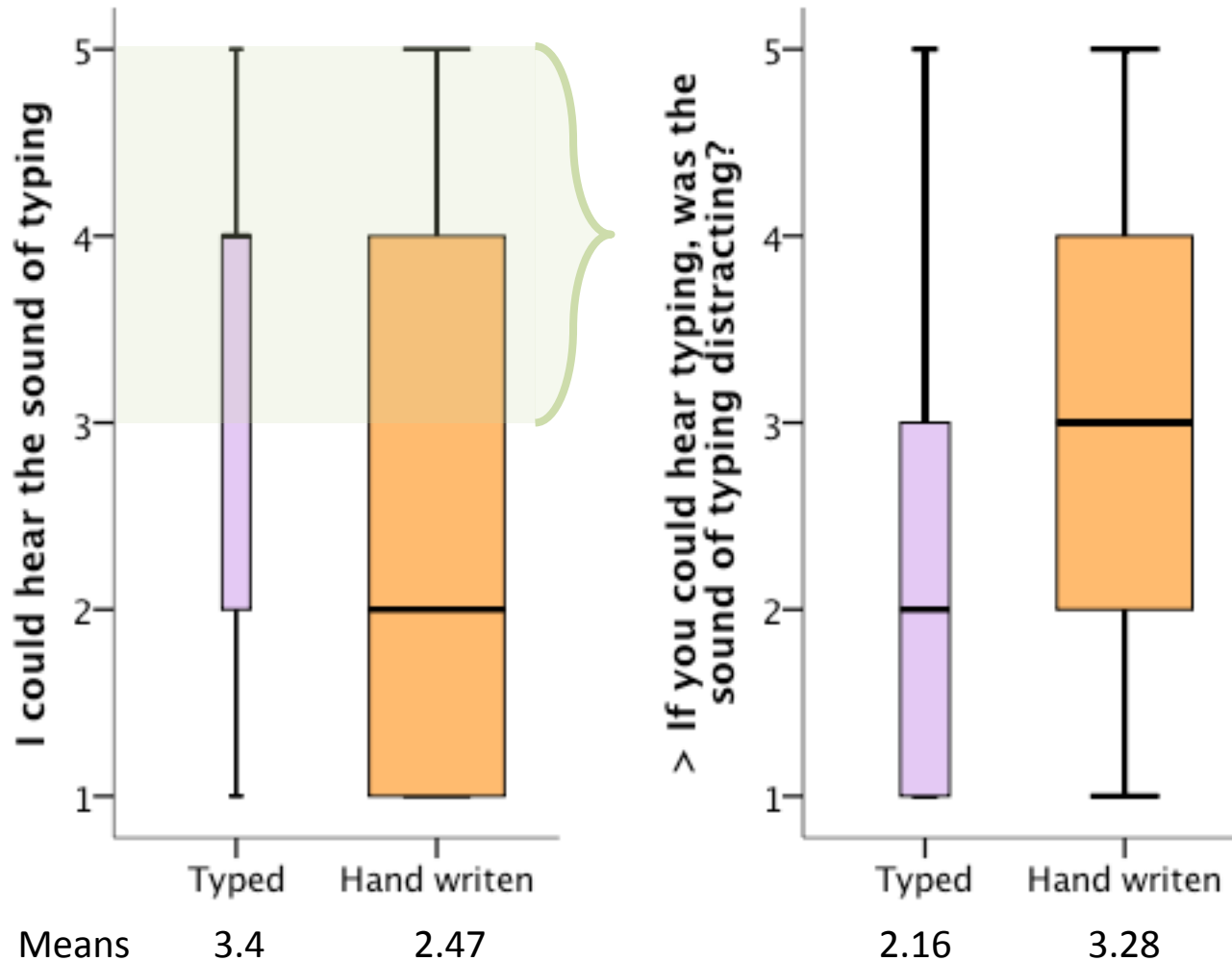
Likert scale: 5 = strongly agree, 1 = strongly disagree. Means shown.

U	13242.5	15203	14527.5	15145.5
Z	-2.132	-0.083	-0.751	-0.394
Sig. (2-tail)	0.033	0.934	0.452	0.694



# Was the sound of typing distracting?

In each boxplot **Typers (left)** and **Hand writers (right)**



Means 3.4 2.47

Both exhibited significant differences to  $>.01$   
 Likert Scale: 5 = Strongly Agree, 1 = Strongly Disagree

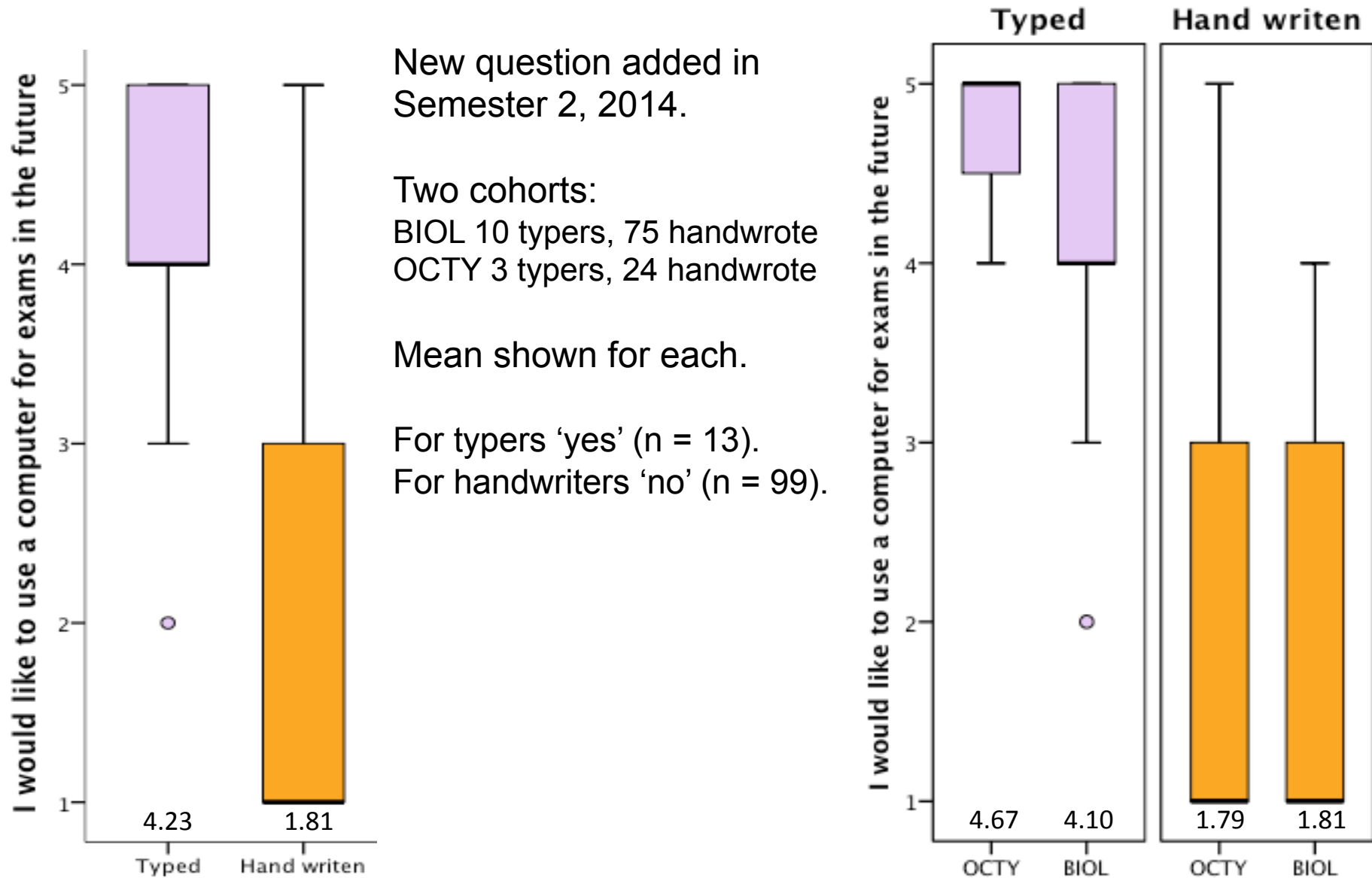
The two cohorts ANIM and BIOL were removed from the analysis because typers and hand writers sat in different rooms.

Those that could hear typing (who selected 5, 4 or 3) were included in the determination of distraction by typing sound.

Cohort exams were held in different venues.

# Future intention to type

## Typers (left) and Hand writers (right)



New question added in Semester 2, 2014.

Two cohorts:  
 BIOL 10 typers, 75 handwrote  
 OCTY 3 typers, 24 handwrote

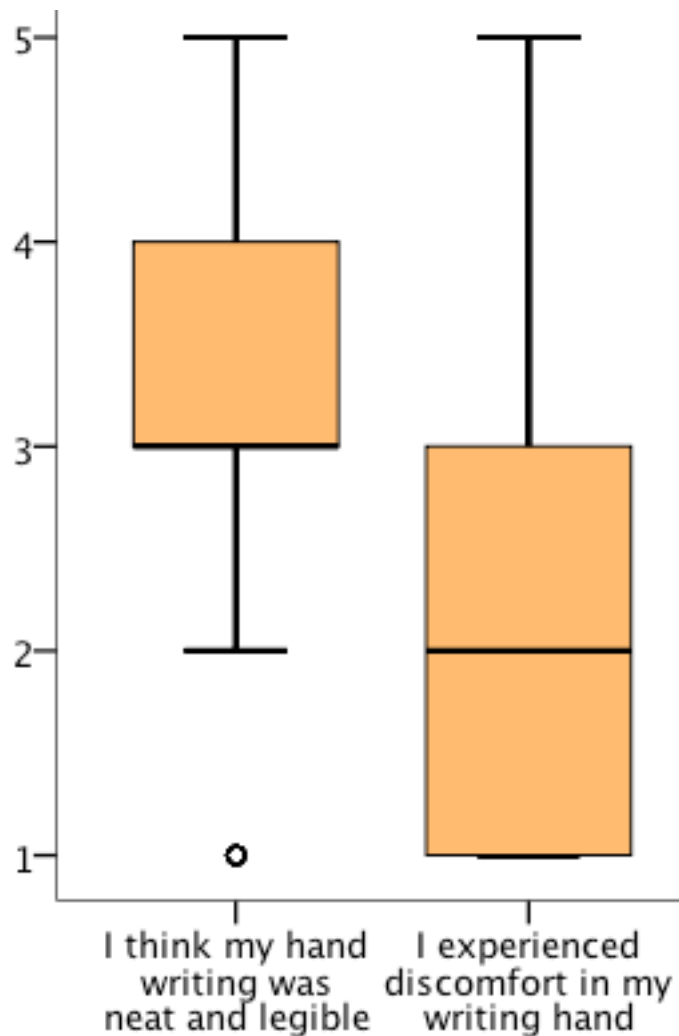
Mean shown for each.

For typers 'yes' (n = 13).  
 For handwriters 'no' (n = 99).

Likert Scale: 5 = Strongly Agree, 1 = Strongly Disagree

# Hand writing in the exam

All six cohorts

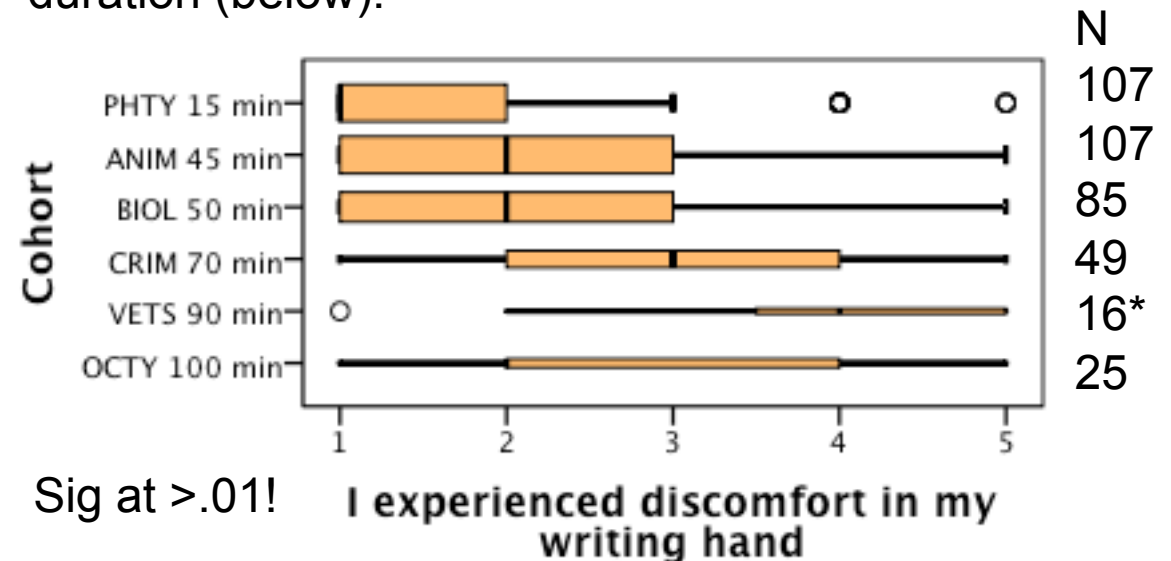


*Are some students over estimating the neatness of their hand writing?!*

Breakdown by cohort



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



Sig at  $>.01!$

\* Note 20% response rate by VETS for this item. All others near 90%

# Trial Technical Issues

**Issue log:** 15 of the 69 who typed reported 'technical issues' via the post-exam survey. 1 more was identified by observation. The majority were minor.

Issue	N	Notes, Additional Observations, Suggested Solutions
Boot/start up	2	In reality most participants needed assistance/forgot boot key. <i>Familiarity: need to practice!</i>
Entering ID	0	All good. (some students entered 's' rather than 8 digit number but system copes fine).
Using the software	1	Some did not know how to 'exit' gracefully (i.e. File save, file exit, shutdown). <i>Need to practice! Investigate an 'I'm finished' script/button.</i>
Battery	0	Most plugged in. <i>Power needs to be available.</i>
Saving files	0	All good. (noticed one student used 'save as' when save was 'greyed out')
Software crashed/ computer froze	4	1 x Old 2009 white Macbook. Office suite quit to desktop. 3 x System drive ran out of space causing the system to crash.
Touchpad/ mouse	7	Sensitivity reported by participants. <i>Some adjustments were made.</i> <i>USB wired mice highly recommended! Investigate drivers.</i>
Scrolling	<b>15</b>	Two finger scrolling opposite to OSX, keyboard shortcuts. Small scroll bars. Sensitivity. <i>Familiarity: need to practice. Larger scroll bars. Investigate a user selectable option for touchpad/scroll behavior (and re-mapping of keyboard shortcuts).</i>

# Minor issues experienced during exams...

**15 x Scrolling** - relates to the ease/fluidity of moving up and down pages/screens.

Two finger touchpad scrolling in the e-exam system was in the opposite direction to OSX but the same as in MS Windows. The size of the scroll bars may have also been an issue when targeting the cursor. (may also relate to the next item)

**7 x Touchpad/mouse - the sensitivity/behaviour** of the software drivers and hardware. The interaction of the touchpad on their laptop and the software may not have been smooth. This may have resulted in erratic cursor movement or overly sensitive movements. Mice were recommended/provided in semester 2 trials.

Keyboard mapping differences from OSX. E.g. short cuts such as 'Command S' becomes 'Control S' in Ubuntu.

**Boot up/start up** - relates to the initial boot process. \* Many observed!

Issues mainly due to users forgetting the 'one time boot' key, or forgetting the key press combination on Apple laptops (i.e. holding down the power key rather than pressing and releasing it while holding down the ALT key to bring up the boot menu).

Technical boot issues were not experienced during exams. This is testament to the need to run pre-exam set-up/practice sessions.

**These can be addressed** though a combination of:

- \* use USB wired mice and/or user selectable/auto keyboard mapping upon boot.
- \* more pre-exam practice by students to familiarise with the software and processes,
- \* ensuring help/testing/set-up assistance is available to catch hardware incompatibilities before they get to the exam room (recommend mock exams too).

# Major issues experienced during exams...

**1 x** Old 2009 white Macbook. Libre office application unexpectedly quit to desktop two mins into a 15 min exam. Continued on paper and given 2 mins extra time. *Better pre-exam testing should catch. Persistent logging to be implemented. Further work on 'recovery' autosave and a 'full' autosave is needed.* \*Recorded via observation.

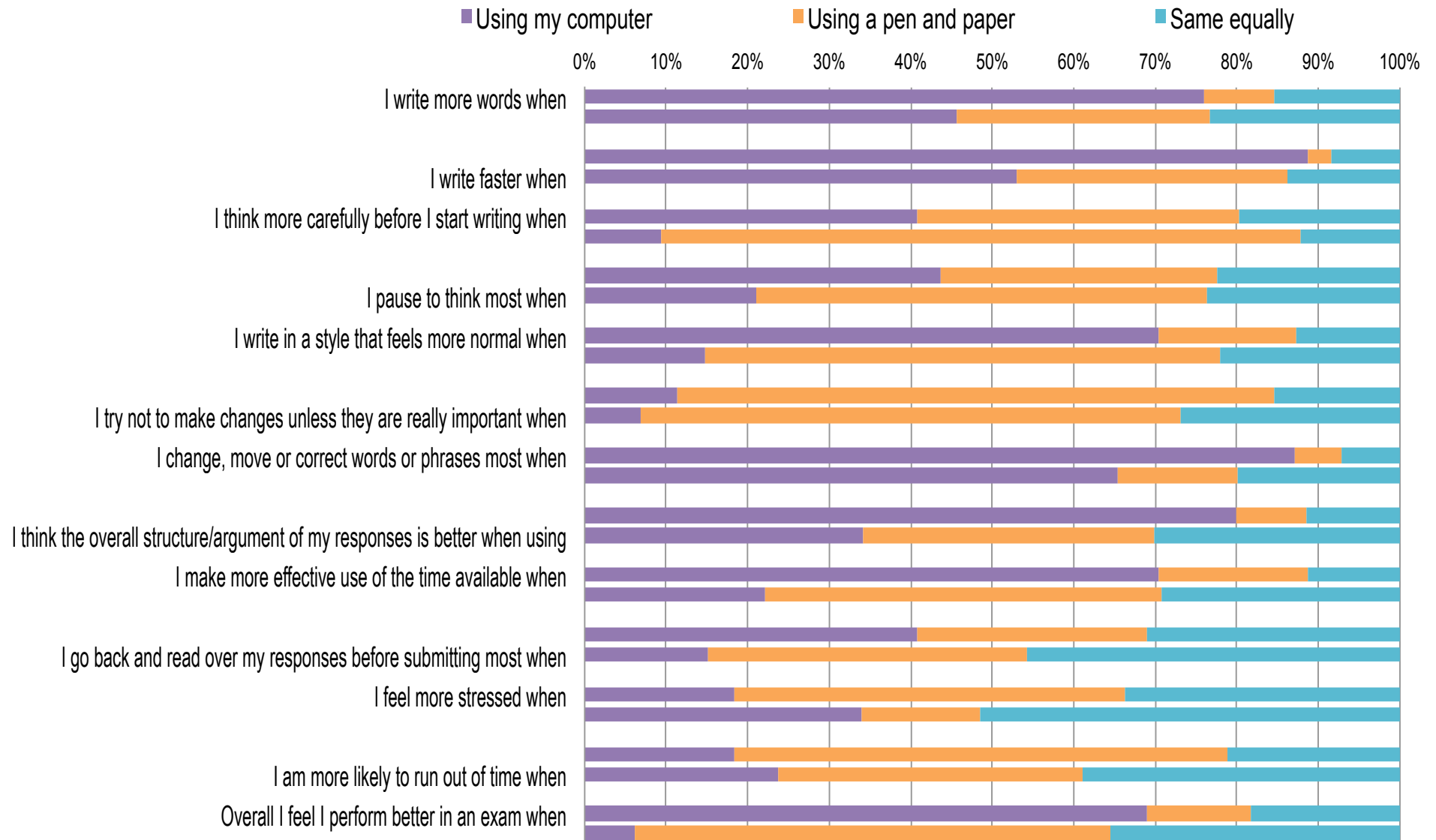
**3 x** System drive ran out of space causing the system to crash. Behavior of auto save function identified as the cause due to recent changes. Impacted OCTY exam only. Students continued on paper. All student data was recovered following the exam. *Changes were rolled back for the next exam that had no further issues. To fix in the next round of updates. More extensive testing regime. A data recovery procedure/advisory has been written.*

**Further development** is needed to address these issues.

Warnings remain in readme files available on public download sites.

# Student consideration of general exam conditions when using computer versus pen:

All six cohorts. Response pairs: those who typed (line 1) & those that hand-wrote\* (line 2)

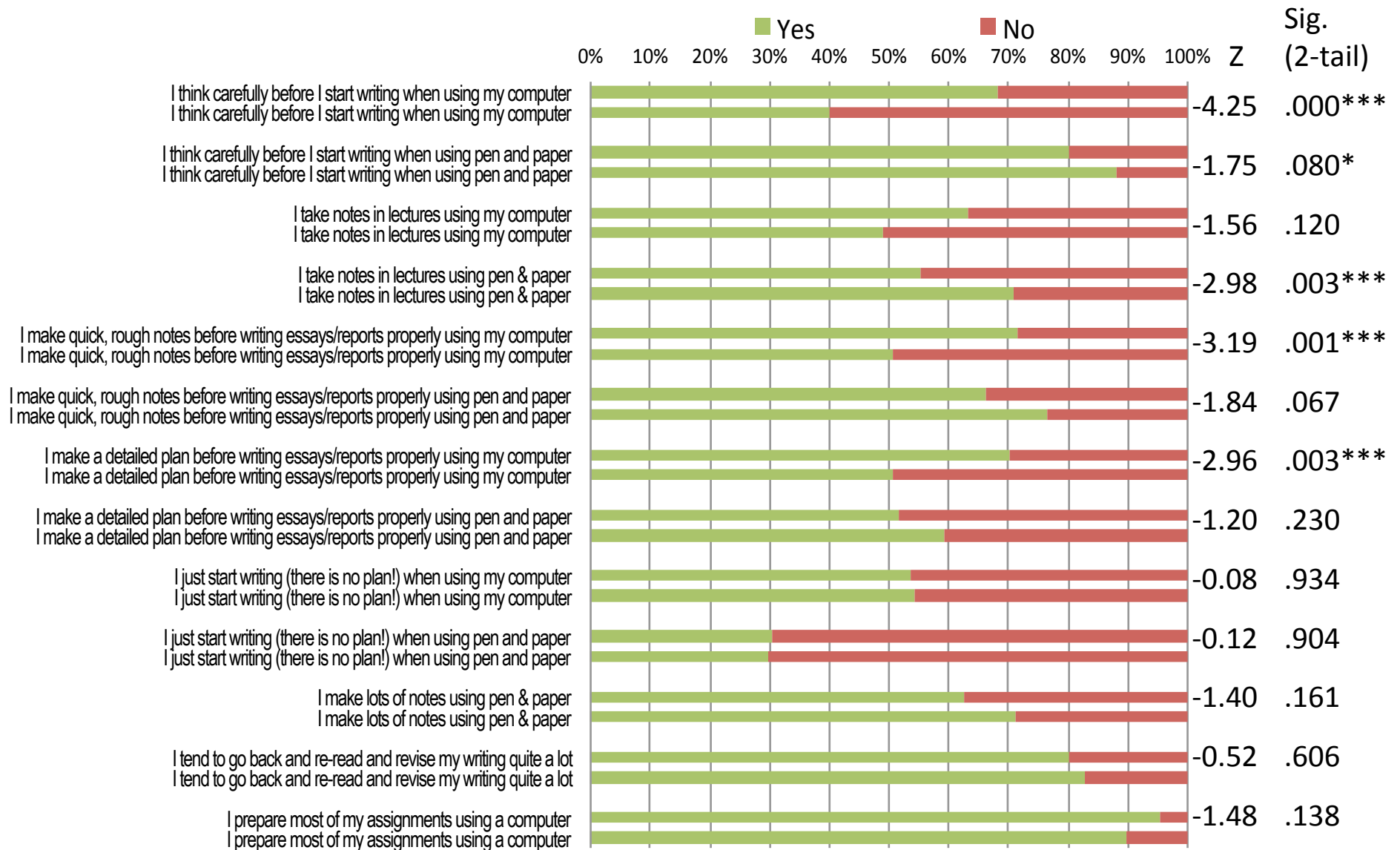


\* Note - Many of those that hand-wrote their exam had no prior experience of using a computer for an exam so the results presented here are largely speculative on their part.

However, it is reasonable to assume that they drew on their general use of computers.

# Writing strategies under non-exam conditions – general writing habits:

All six cohorts. Response pairs: Typers (line 1) and Hand writers (line 2)



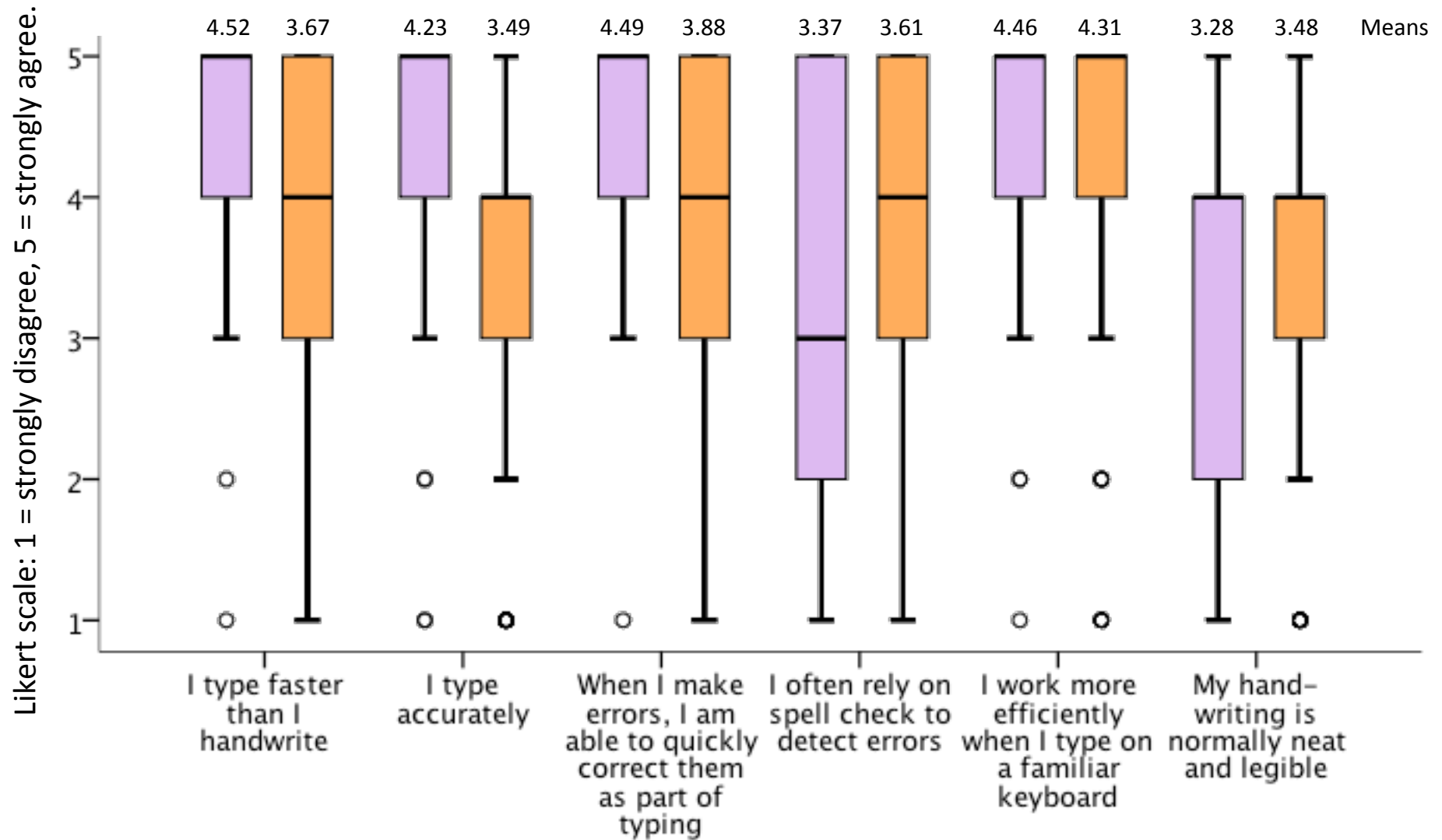
Nonparametric U & Z used to compare those who typed in the exam to those that hand wrote.

Note! The September 2014 edition of this chart was incorrectly reversed against the stats.



# Student reaction to exam conditions

## Typers (left) and Hand writers (right)



Mann-Whitney U	8213	7551.5	8523	11097	10917.5	11621.5
Z	-4.637	-5.089	-4.248	-1.342	-1.656	-0.77
Sig. (2-tailed)	>.001	>.001	>.001	0.179	0.098	0.441

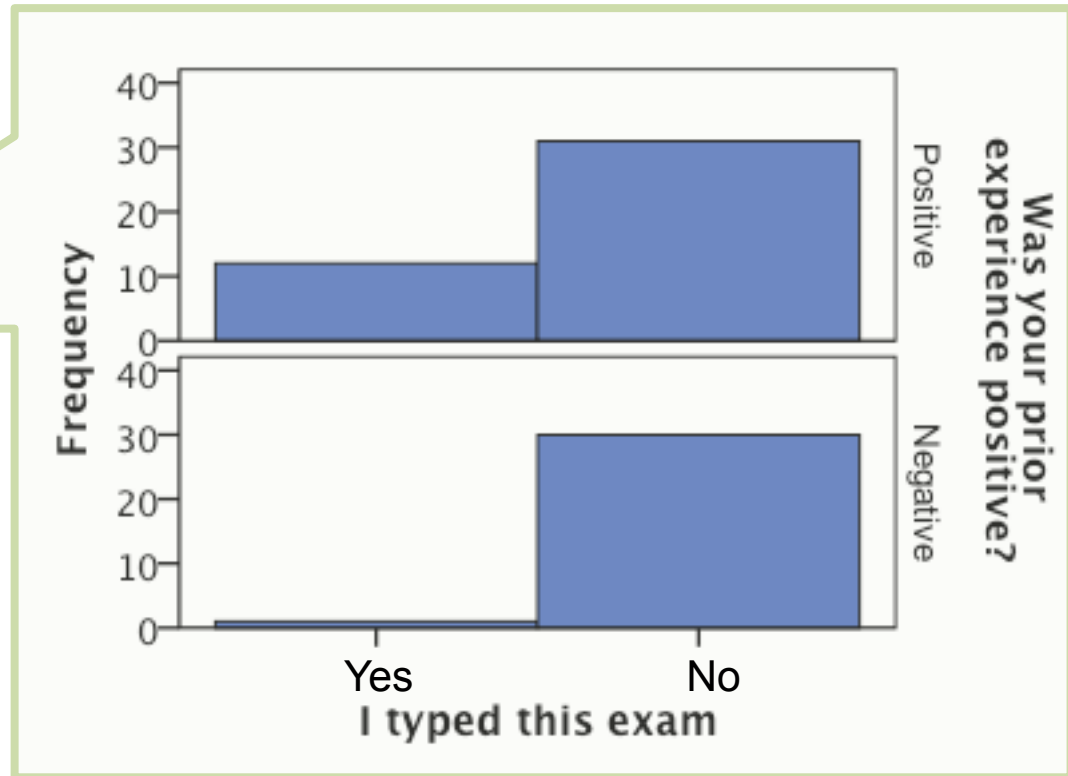
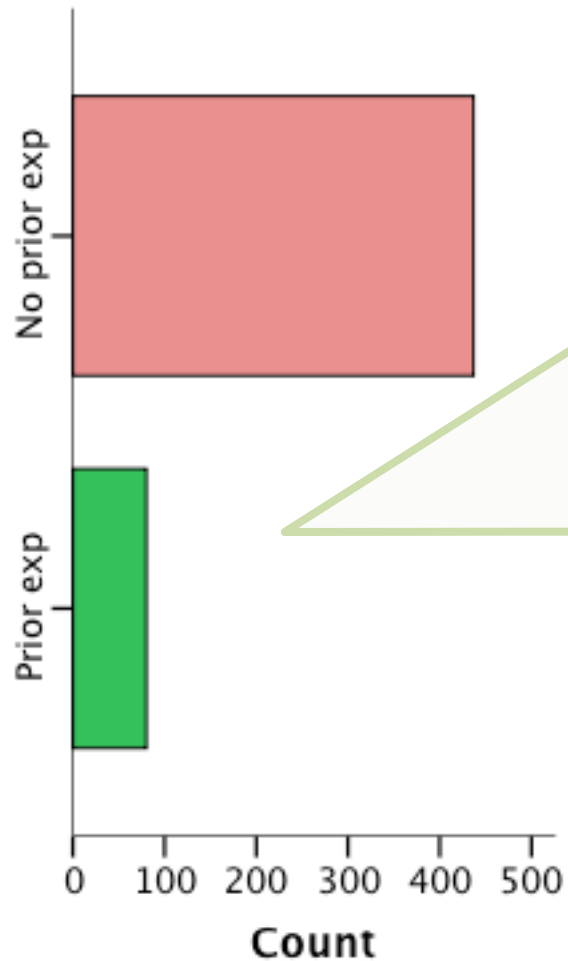
# Did the nature of prior experience of e-exams impact on the decision to type this exam?

All participants, all cohorts.

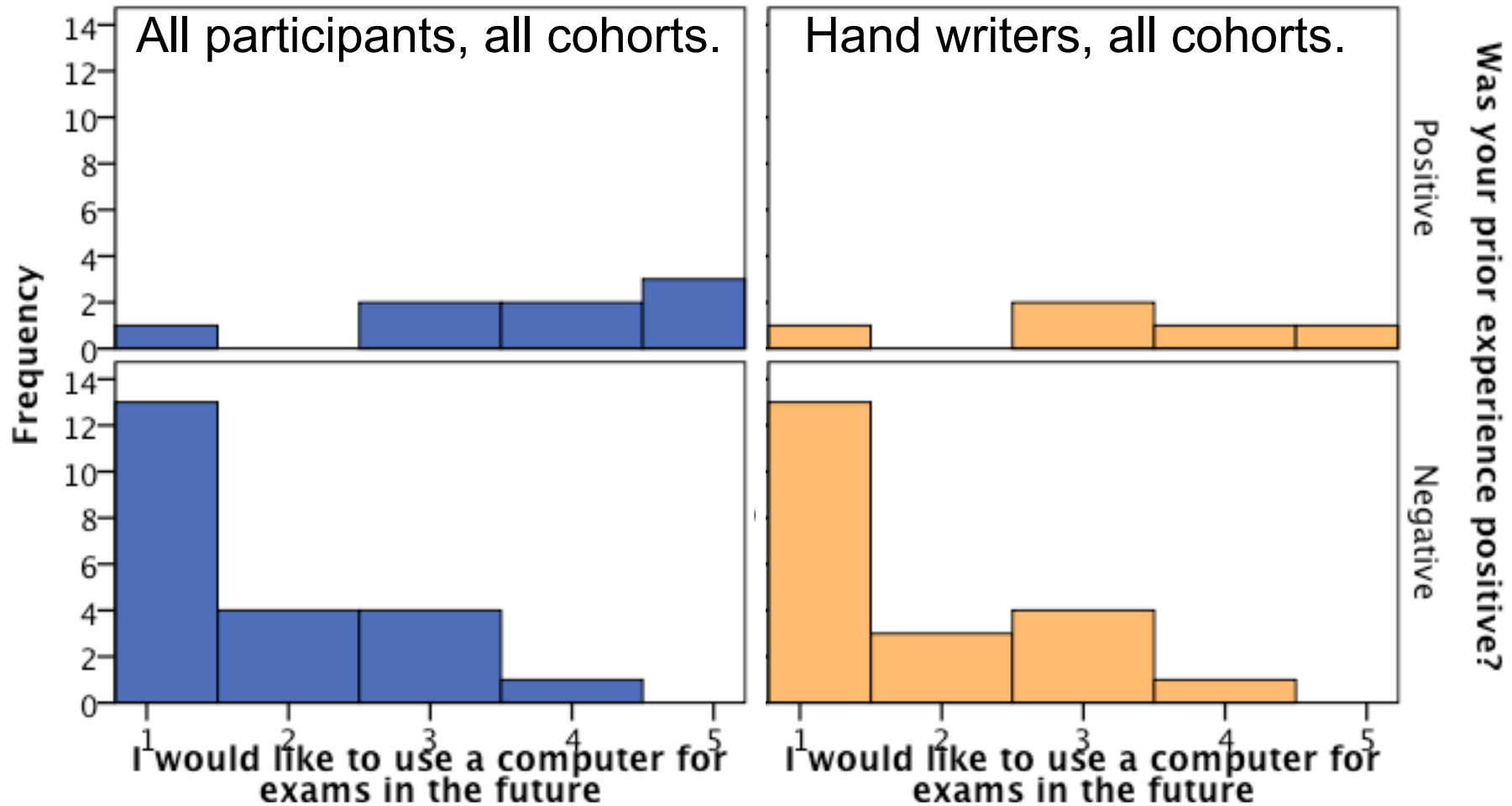
Of those with Prior exp.	All
Mann-Whitney U	502
Z	-2.734
Sig. (2-tailed)	>.01

Looks like a 'yes'!

Before this exam, I had used a computer to type responses to a short answer or essay style exam.



## Does the nature of prior experience of e-exams impact future intended use?



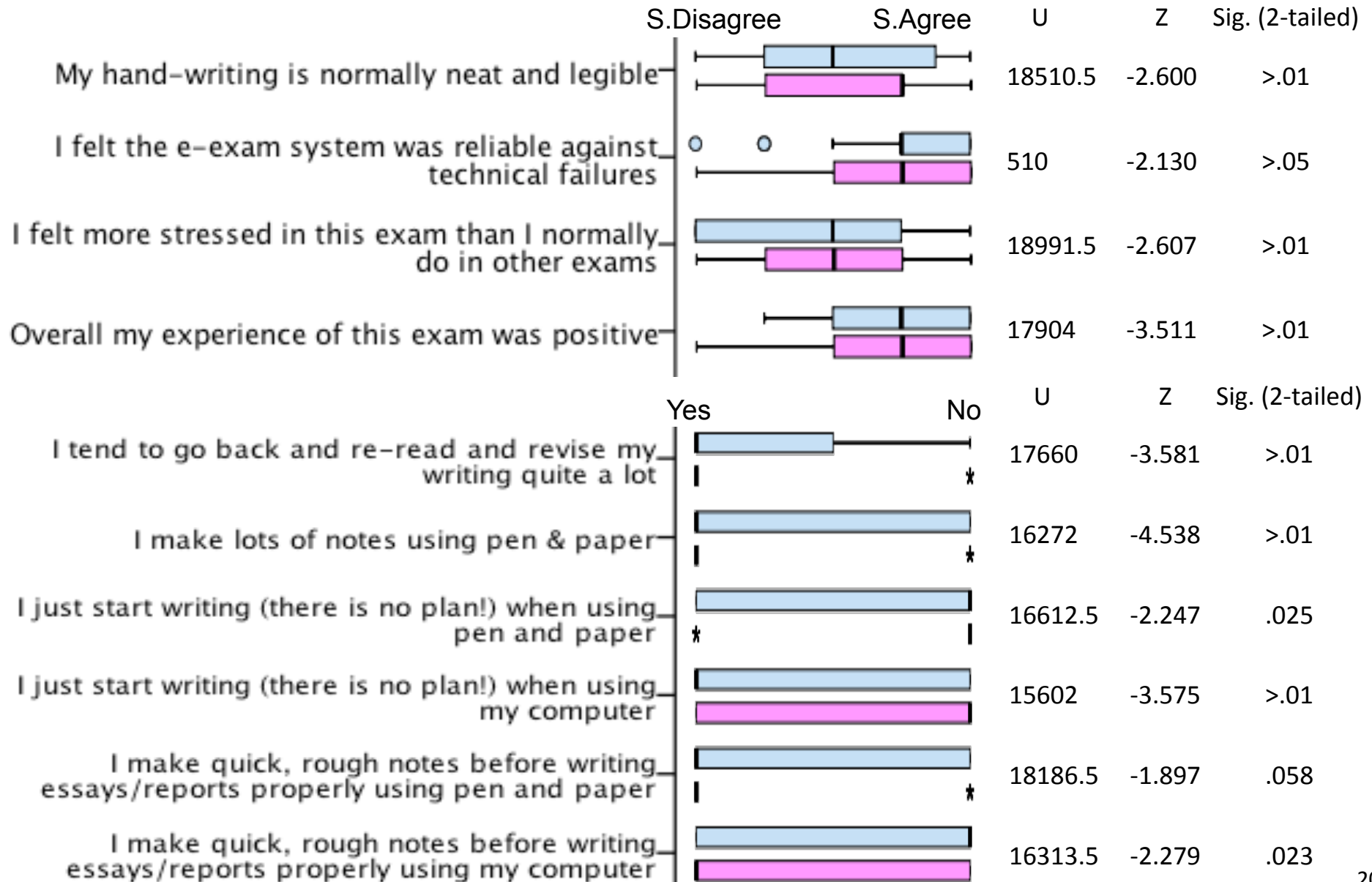
	All	Hand writers
Mann-Whitney U	22.5	21
Z	-3.262	-2.248
Sig. (2-tailed)	>.01	>.05

Looks like a 'yes'!

# The role of gender in exams and writing habits

All participants, all cohorts. 9 out of 52 items were significant with one coming close.

The significant items are shown below with Male (Line 1) and Female (Line 2).



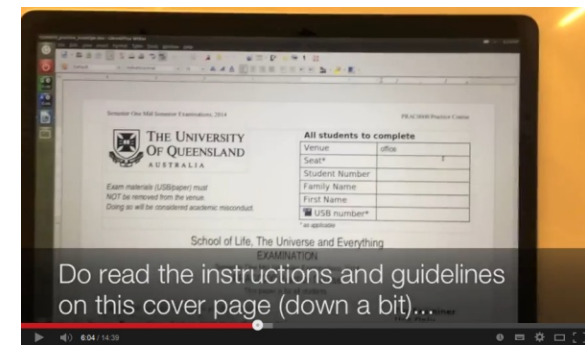
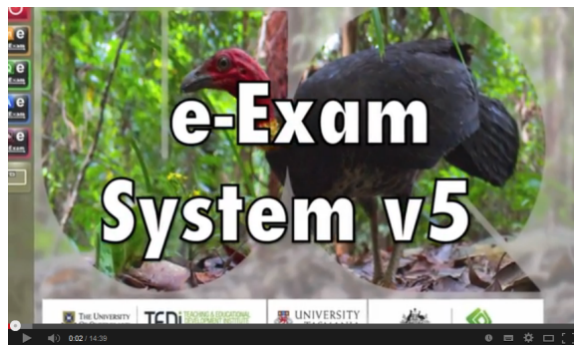
# e-Exam Project Resources

More information....

Demo set-up Guide,

Student Practice and User Guide

<http://transformingexams.com>



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>

Contact: m.hillier[at]uq.edu.au

# Cite

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