



Strengthening assessment integrity of online exams through remote invigilation



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Question 1
The Unit Outline specifies that the word limit for the Video Business Case Report is?
[Source: Business Capstone Unit Outline]

- ☐ A. <2,000
- ☐ B. <1,000
- ☐ C. <5,000
- ☐ D. <300
- ☐ E. <500

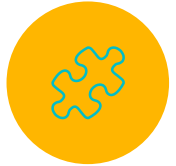
Question 2
The Unit Outline specifies that the 'Human Resources (HR) Module' will be activated in the
Competition Round?
[Source: Business Capstone Unit Outline]

- ☐ A. 6
- ☐ B. 2
- ☐ C. 4
- ☐ D. None of the other answers
- ☐ E. 5
- ☐ F. 3

Question 3
Save and Submit



Are online
tests and
exams the way
of the future?



Should institutions adapt
their assessment
methodologies to
technology, or should
technology adapt to
assessment
methodologies?



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The Problem

Online global education

- Online assessment has lagged behind online learning
- Potential increases in cheating and fraud risk

Single approach to mitigating assessment risks in online assessments

- Costly for universities and potentially for students
- Limited mitigation of risk
 - Additional workload to follow-up suspected breaches of academic integrity
- Primarily a deterrent

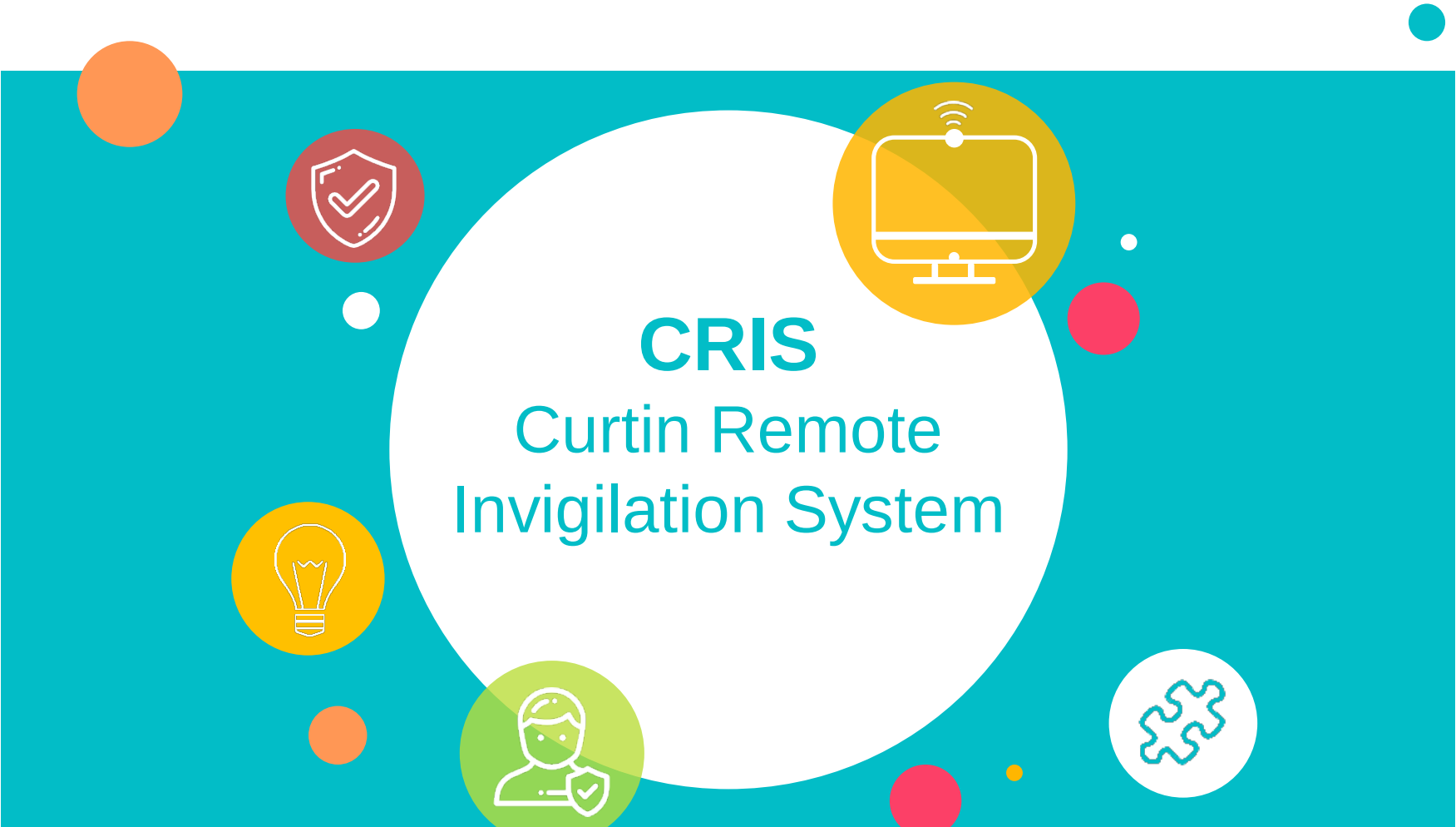


Project Aims



- Investigate the feasibility of implementing a locally developed remote invigilation system
 - Reduced system costs?
 - Low technical support requirements
 - Less-intrusive
 - Ease of use
 - Students
 - Unit teaching staff
 - Estimate workload to follow-up suspected breaches of AI
 - Opportunities to co-develop a solution using an agile approach





CRIS

Curtin Remote Invigilation System

Proposed Solution



Curtin Remote Invigilation System (CRIS)

Asynchronous authentication of student identity and monitoring during online assessments

- Browser based plugin
 - custom Chrome web browser extension
- Recording student behaviour
 - webcam
 - microphone
 - screen workspace
- Automatic flagging of suspected dishonesty
 - facial recognition
 - volume spikes
- Recordings Review Dashboard



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Context

- Customise the EIT Chrome extension for Blackboard
- Pilot in one Curtin unit
 - Business Capstone
 - Unit runs Semester 1 and Semester 2
 - Cohorts F2F and fully-online
 - Fully online and OUA
 - Flipped classroom
 - 10 x 10 min eTests per study period
 - Choose your own eTests (2 options)
- Research project to identify student perceptions and ease of use





Broad Challenges of CRIS

Challenge 1

Ease of use

No downloading large software packages

Staff easy access to flagged results to examine potential misconduct

Challenge 2

Integrate with multiple LMS platforms

Avoid creating building blocks

Difficulty when LMS is updated - synchronisation integrity

Challenge 3

Comprehensive capture

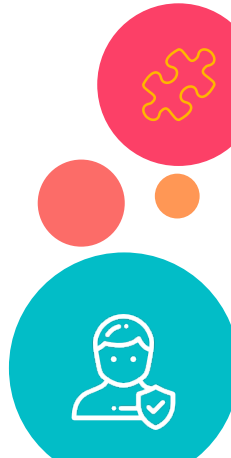
Students can not take test without proctoring enabled

Password protected



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CRIS Implementation - Student

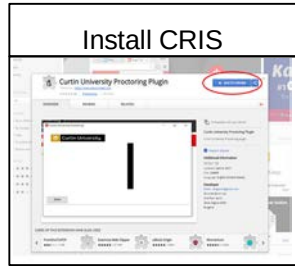


Figure 1: Install CRIS



Figure 2: Access assessment

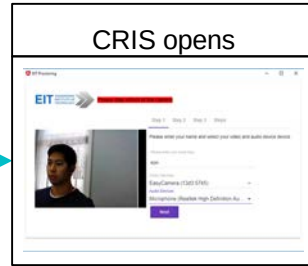


Figure 3: CRIS plugin opens

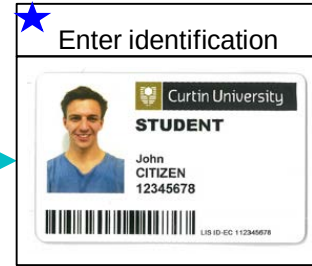


Figure 4: Identification entry

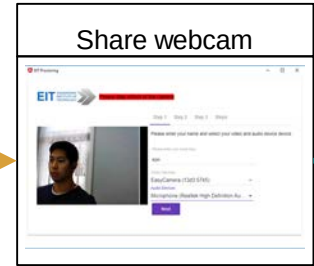


Figure 5: Sharing webcam

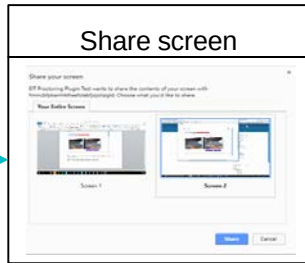


Figure 6: Sharing screen



Figure 7: Password auto-populated



Figure 8: Start assessment

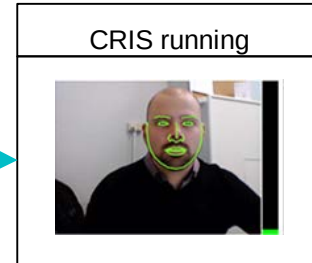


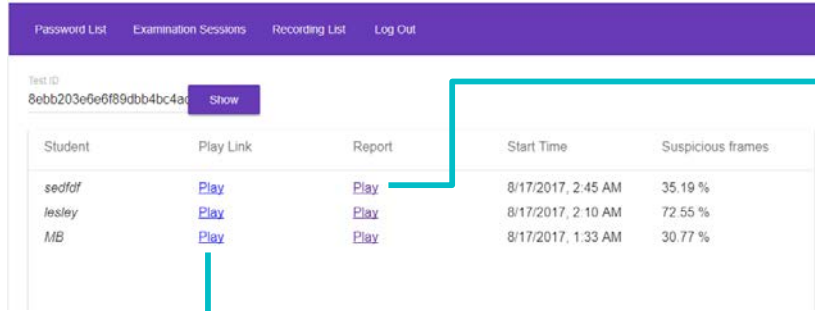
Figure 9: Running CRIS



Figure 10: Finish test and upload

CRIS Implementation - Staff

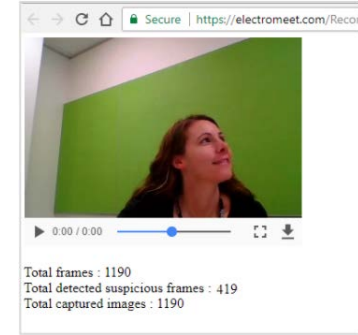
Recording management dashboard



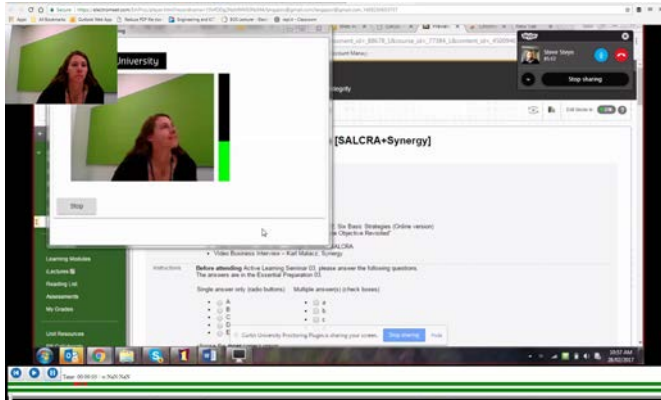
The dashboard features a purple header with navigation links: Password List, Examination Sessions, Recording List, and Log Out. Below the header, a 'Test ID' field displays '8ebb203e6e6f89dbb4bc4a' with a 'Show' button. A table lists student recordings with columns for Student, Play Link, Report, Start Time, and Suspicious frames. A blue arrow points from the 'Report' column to the 'Flagged frames only' window, and another blue arrow points from the 'Play Link' column to the 'Full Playback' window.

Student	Play Link	Report	Start Time	Suspicious frames
secd/f	Play	Play	8/17/2017, 2:45 AM	35.19 %
lesley	Play	Play	8/17/2017, 2:10 AM	72.55 %
MB	Play	Play	8/17/2017, 1:33 AM	30.77 %

Flagged frames only



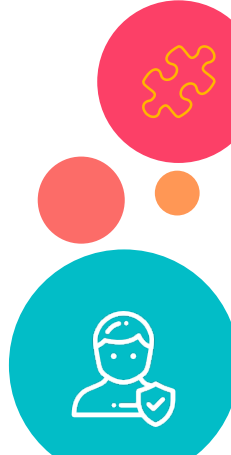
Full Playback





Semester 1: Data Demographics

Demographics	N
Actively enrolled students in the unit	95
Unit Recordings (35% of total possible)	421 / 1204
Students with full consent	52
Recordings consented for research	159
Student experience surveys	32





Why were students flagged?

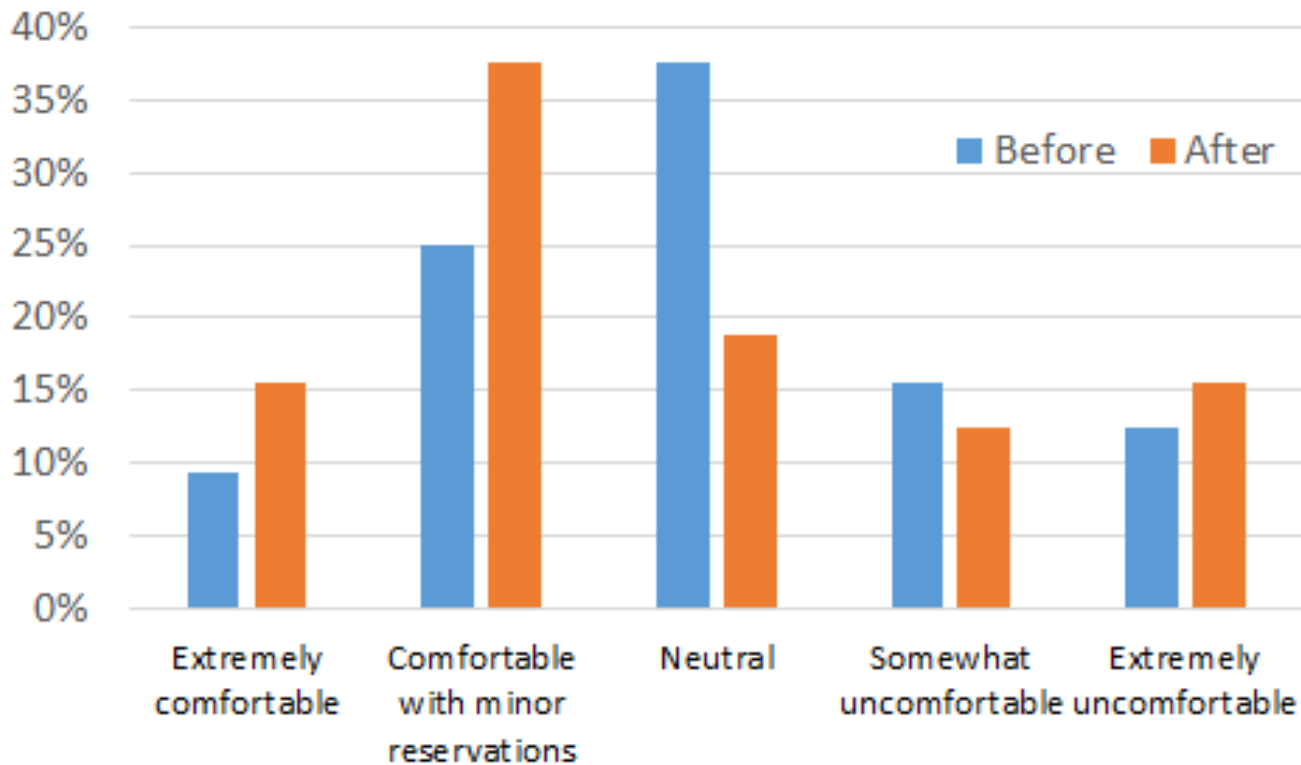
Flag Category	n	Proportion (N=159)
Hand on/near face or head	77	48%
Looking down/away from screen	59	37%
Full face not showing in frame	49	31%
Background flagged for facial recognition	42	26%
Hat/earphones on	13	8%
Bright background/shadowed face	11	7%
Public space/another person present	10	6%
Moved out of the frame/room	2	1%
Non-test screencapture	1	1%
Answered the door	1	1%

Staff Workload

- Will vary according to time and number of eTests
- Roughly 1 min per student per eTest currently
 - Time required if student follow-up is necessary; if, for example, students are not following eTest rules, camera is side-on etc.
- Time for CRIS instruction setup - 1-3 hours
 - Includes putting links to CRIS in LMS, instruction sheets, demo eTest (if required)
- Student Queries/Concerns - < 1 hour (fewer than expected!)



Student Perspective: Level of comfort with remote invigilation



N = 32

Progressive Updates



1. **Enforcement** - ensuring students use CRIS
2. **Assessment synchronisation** - start and stop of CRIS while linked to assessment
3. **Upload redundancy** - closing browser, or experience internet connection issues
4. **Flagged frame sensitivity** - flagging of normal behaviour
5. **Event log** - information on states and actions for debugging CRIS



Future work



1. **Configurability** - allowing further selection and configuration of features
2. **Smart Flagging** - Embedded intelligence for real-time human-like verbose guidance
3. **Desktop flagging** - Tab and application switching
4. **Bandwidth benchmarking** - testing student bandwidth to give estimate of upload duration
5. **Identity check** - Student ID vs webcam feed verification
6. We want to collaborate
7. Have a go!



Questions?