

'Learning from Digital Exams'

Brunel University

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**Establishing high
stakes computer-
based testing through
Blackboard:
challenges & lessons
learned**

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VLE Exam

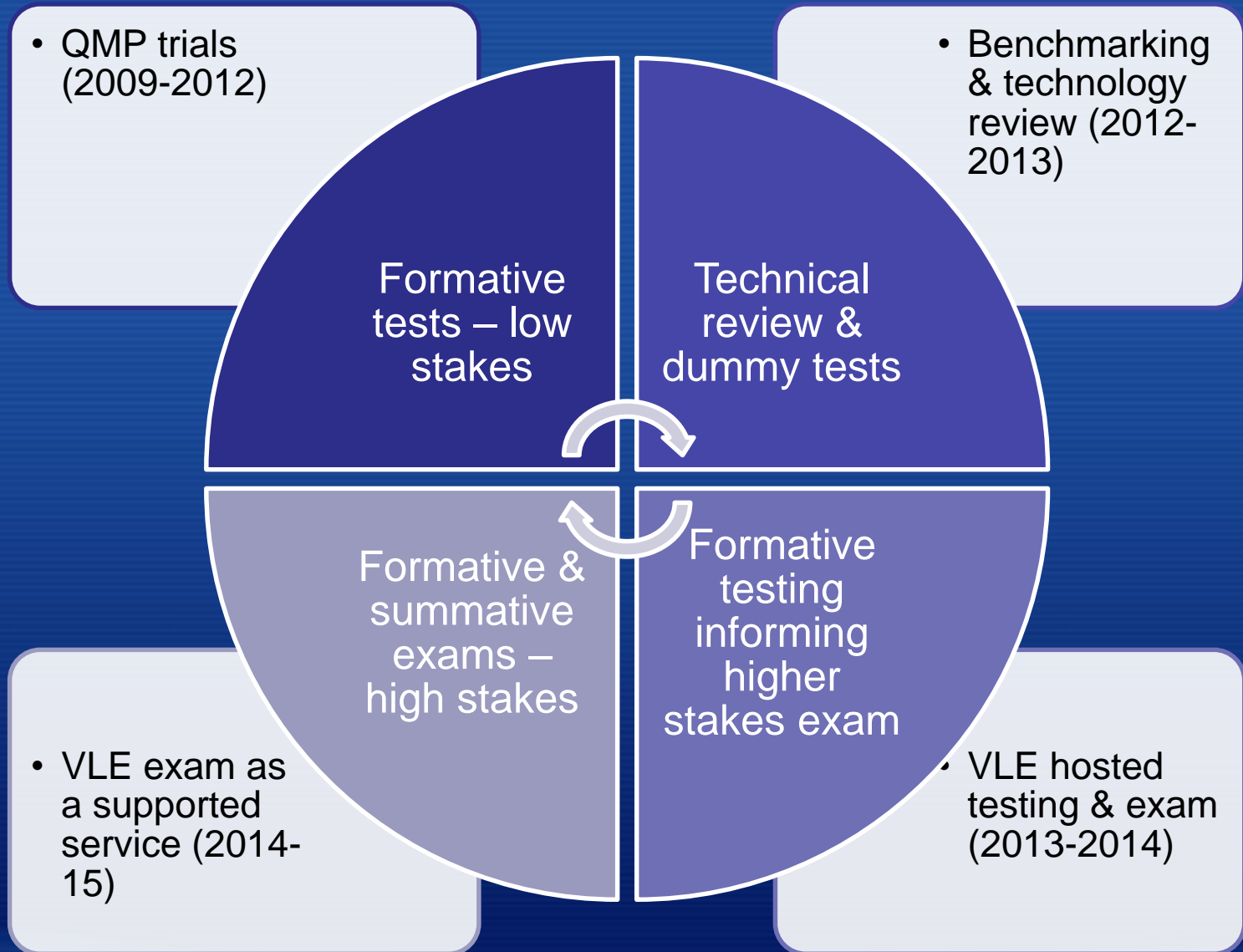
Secure online assessment service

<https://elearningyork.wordpress.com/key-areas/vle-exam/>



- Dedicated instance of VLE, separate from the main VLE platform
- Automated marking of tests with defined responses (MCQs). Scope also for longer answer open responses
- Students access via a locked-down desktop environment – only access to exam server permitted
- Exams delivered successfully to 200+ students (PGT & UG) across 4 PC classrooms (from Jan. 2015 -): multiple rooms with simultaneous testing

Our journey: An evolutionary approach



Defining Failure



Hard Failure (*crash and burn*)

Network failure

Loss of student data
Multiple workstation failure.

Timetabling/room allocation errors

Room capacity /
Students sent to wrong rooms

Technical

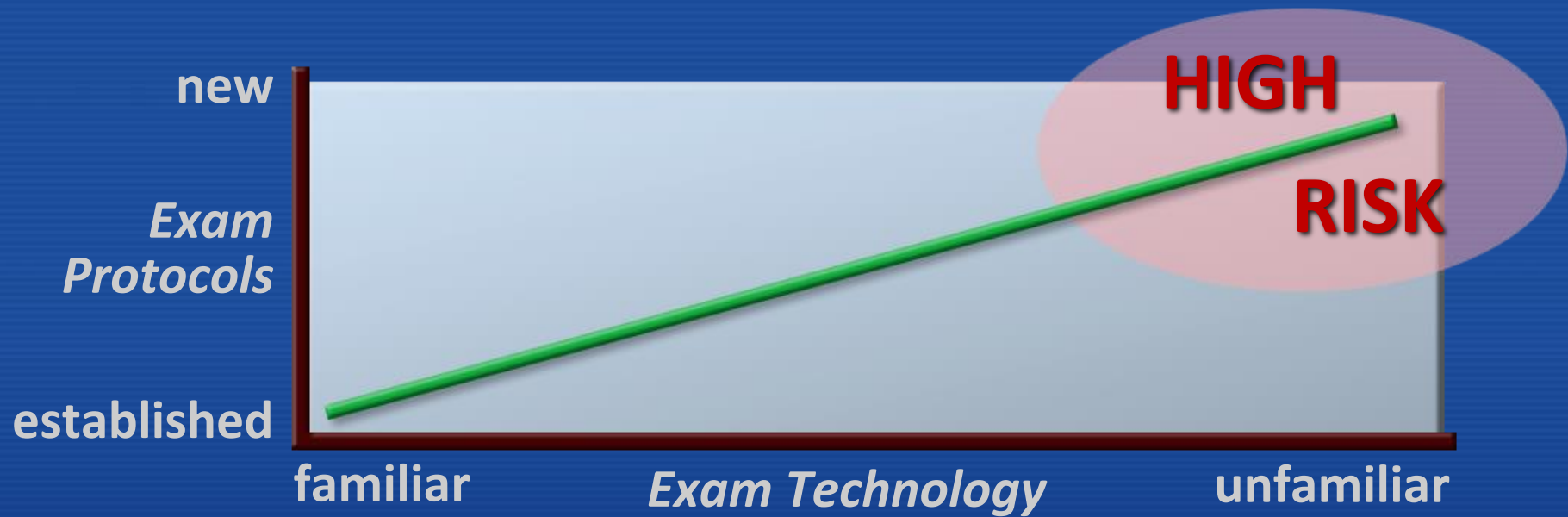
Support

Soft Failure (*only just worked*)

Variability in connection speeds / server responsiveness (latency)

Invigilators unfamiliar with E-Exam protocol

Perceptions and Risk Management



Fear of unknown



Higher anxiety levels

- E-Exam: Must be intuitive, flawless and pedagogically fit for purpose (valid, reliable, secure)
- Electronic provision can magnify existing weaknesses in institutional processes

Addressing failure: Enhancement agenda for the VLE exam service



Priority area	Focus	Stakeholders
Technical challenges	Configuration of test environment: security; tuning; performance; network management	<ul style="list-style-type: none">- IT desktop & network- VLE administrator- VLE Manager
Exam design	Design & composition of question-set; Management of question blocks (randomisation) Quality testing	<ul style="list-style-type: none">- VLE Manager- Academic exam coordinator & question authors
User support (key stakeholders)	Orientation to exam environment and exam protocols	<ul style="list-style-type: none">- Academic exam coordinator (departmental team)- Students- Exams Office (invigilators)



- **Configuring the exam environment**
 - Both *shared* and *dedicated* systems considered as options
 - Decision to opt for *dedicated* exam platform
 - Easier to configure, monitor and manage
 - Configuration specific for exams
 - All traffic is exam traffic
 - Shared platform more difficult to manage
- **Managing the locked-down desktop**
 - Boots straight into browser and VLE EXAM URL



▪ Server

- Restricted access (IP restrictions / module availability)
- Exam available for duration of exam only
- Separate user accounts (exam number / student ID)

▪ Client

- Zero client can be used anywhere
- Specifically designed for VLE EXAM
- Only app is browser, no other apps available
- Browser restricted to accessing VLE EXAM server URL



- **Upgrading**

- Regular upgrades, matching main VLE
(Apr14 much better experience, randomisation cured)

- **Restarts**

- System restarted prior to examination sessions to reduce issues from any possible memory leaks

- **Priming the caches (exercising question items)**

- Prior to each exam caches are primed by running through exam on each app server



- Attention to proportion of short answer (essay) questions to MCQs
- Use of blocks (question type / difficulty)
- Randomisation by question type (higher value questions served up first to all)



- Academic support:
 - training on test / question pool design
 - provision of test student accounts
 - quality checking of exam (sense and flow) with attention to sequencing and order of questions

Revising the examination



Summative Examination January 2014

[Edit the Test](#)
[Edit the Test Options](#)

Exam paper reference (module code): EDU00033M
 Y OF YORK
 ons 2013-2014

Summative Examination January 2014

Analysis Last Run June 21, 2014 11:45 AM. Run Item Analysis again to display the latest question data

[Edit Test](#)

Test Summary

121.0	36	0	162	58.79	01 hr 58 min
Possible Points	Possible Questions	In Progress Attempts	Completed Attempts	Average Score	Average Time

Discrimination

17	Good Questions	
16	Fair Questions	
3	Poor Questions	
0	Cannot Calculate	

Difficulty

6	Easy Questions	
22	Medium Questions	
8	Hard Questions	

Filter Questions

Select Question Type:

All Question Types ▼

Select Discrimination:

All Discrimination ▼

Select Difficulty:

All Difficulty ▼

Go

Reset Filter

Page 1 of 2 > >>

Question	Question Type	Discrimination 	Difficulty	Graded Attempts	Average Score	Std Dev	Std Error
● Question 33: What are the assumptions that you need to bear in mind when choosing to calcu...	Multiple Answer	-0.01	68.52%	162	2.75	0.7	0.06
● Question 7: Which of the following terms are considered to be more appropriate for descri...	Multiple Answer	-0.01	58.03%	162	1.17	0.58	0.05
● Question 20: Read the following definition. Emerging theoretical considerations guide the...	Fill in Multiple Blanks	0.07	6.8%	162	0.14	0.51	0.04



- Student support:
 - socialisation of learners
 - guidance, preparation & opportunities for practice:
 - video tutorial of exam environment
 - controls & guidance slides...
 - alignment of formative to summative test experience (question difficulty / timed conditions)

The LEeAP framework



Socialisation

- **Orientation of students to assessment methods**

Preparation of students for assessment

- **Guidance and preparation of students for computer-based testing:**
 - Digital skills; Exam technique; Revision strategy

Assessment design and interface

- **Organisation and presentation of question-set, preparation of user interface and assessment venue:**
 - Assessment design; Design of assessment interface; Preparation & management of assessment centre(s)

Applying LEeAP to VLE Exam delivery: key changes



Socialisation

- Briefing on general exam regulations
- Video tutorial of exam environment controls
- Examples of each question type on VLE training module

Preparation of students for assessment

- Formative assessment aligned with summative (question types, difficulty and time pressure)

Assessment design and interface

- Questions blocked according to marks available

Good luck.

Multiple Attempts Not allowed. This test can only be taken once.

Force Completion This test can be saved and resumed later.

Question Completion Status

1 2 3 4 5 6 7 8 9 10 11

⚠ Moving to another question will save this response.

Question 1 of 11 > >>

1 points Save Answer

Question 1

A teaching assistant is working with a mathematics intervention group involving ten children. He assesses the children and obtains the following scores out of 10.

3, 4, 4, 5, 6, 6, 6, 7, 9, 10

What is the mean test score for the intervention group?

To navigate the questions in the exam you can use the blue bar above where the questions are displayed

ONLY when you have finished:

1. Go to the last question
2. Click Save and Submit
3. Click OK

Do not click SAVE AND SUBMIT if you have not finished the exam. You will NOT be able to re-enter the exam



- Invigilator support:
 - briefed on exam environment
 - ELDT in attendance throughout exam
 - ELDT now oversee logging in procedure
 - ELDT assist with workstation failures, moving students to spare PC
 - ELDT verify when exam finished / submissions received, making VLE exam site unavailable

But we still face ongoing challenges....



- People and processes:
 - room allocation and bookings (Timetabling)
 - invigilator confidence and expertise
- Estate:
 - room capacity and sustainability / extensibility of service (challenges of common assessment period)
- Resourcing and scalability:
 - reliant on dedicated Digital Workspace, IT network & ELDT support



- **VLE Exam guidance & protocols:**

- <https://elearningyork.wordpress.com/key-areas/vle-exam/>

- **VLE Exam video case study:**

- <https://elearningyork.wordpress.com/learning-design-and-development/case-studies/vle-exam/>

- **Research paper:**

- Walker, R. & Handley, Z. (2016). Designing for Learner Engagement with eAssessment Practices: The LEeAP Framework. *Research in Learning Technology*.
<http://dx.doi.org/10.3402/rlt.v24.30083>
 - LEeAP framework: <http://tinyurl.com/LEeAP-framework> [pdf]

Thank you!

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