



# Educational Advantages of Computer-based Examination

Geoffrey Crisp

# Learning and assessment of 21<sup>st</sup> century skills

<b>Ways of thinking</b>	Creativity and innovation; critical thinking, problem solving; learning to learn, metacognition
<b>Ways of working</b>	Communication; collaboration (teamwork); employability, enterprise formation skills and leadership
<b>Tools for working</b>	Information and ICT literacy; using discipline resources and tools
<b>Living in the world</b>	Citizenship – local and global; life and career; personal, social and environmental responsibility



# Is this your learning and assessment space?



Teaching spaces  
determine  
assessment spaces

University of Bologna, Laurentius de Voltolina 14<sup>th</sup> century lecture  
The Yorck Project: 10.000 Meisterwerke der Malerei. DVD-ROM, 2002.



# Is there a difference?

## Does this learning space foster 21<sup>st</sup> century skill development





### How I teach

- with technology
- with others
- with inspiration

### Where I teach

- anywhere
- collaborative classrooms
- online

### How I assess

- authentic
- flexible
- negotiated

# Online assessment and e-exams

### Where I assess

- online
- at home
- at work
- in class



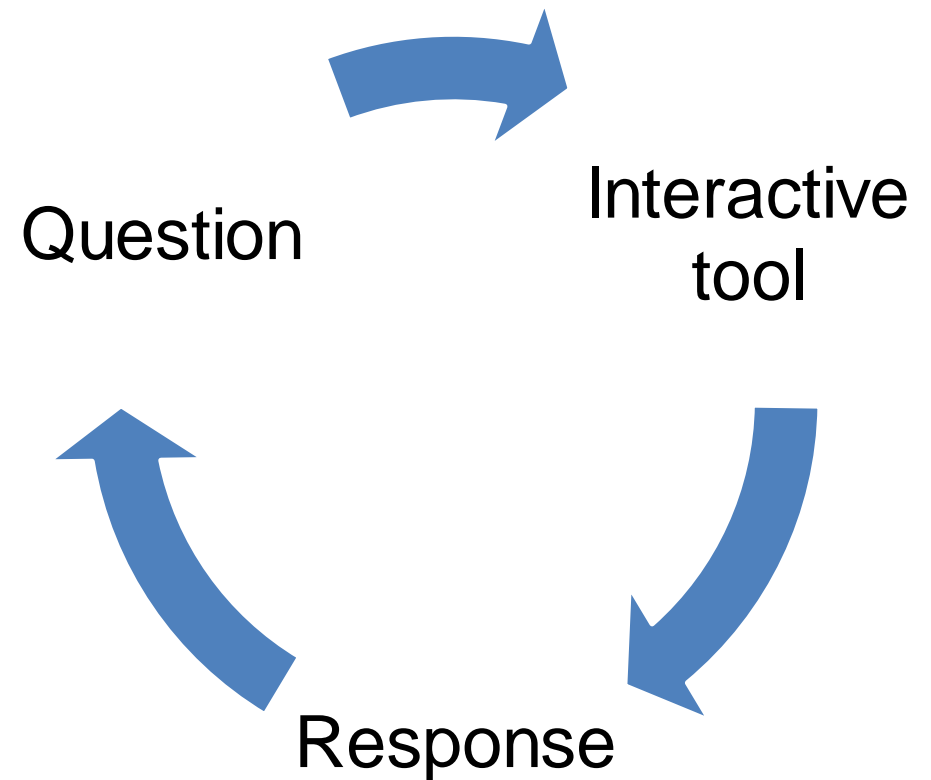
**Rethinking curriculum design so that it assesses  
discipline knowledge and skills as well as their  
application in an authentic environment in collaboration  
with other people and resources**





# Interactive online assessment design

Separate the interactive tool/object/artefact from the question and the feedback







# Quizzes with interactive tools

☐ F. Cu

☐ G. Rb

Check

Use the Periodic Table below to answer the following questions

1. As you move from left to right across the second and third row of the Periodic Table the atomic radius

2. This is because the nuclear charge  as you move from left to right across a row of the Periodic Table but the outer electrons are in the  quantum shell

[Periodic Table](#)

Check

Use the Periodic Table below to match the element and the properties indicated.

[Periodic Table](#)

The alkali metal with the highest first ionization potential is

The halogen with the highest first ionization potential is

The alkali metal with the lowest first ionization potential is

The halogen with the lowest first ionization potential is

Check

# Quizzes with interactive tools

RMIT University | Melbourne x Progress Report - geoffre x RMIT University - Calend x Pricing | Prezi x CHEM01: Structure-activit x Calculation of molecular x

www.transformingassessment.com/moodle/mod/quiz/attempt.php?id=265

Home Attempt 1 Update this Quiz

**Chemistry** You are logged in as Transforming Assessment Admin (Logout)

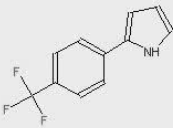
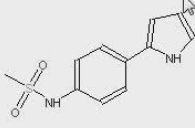
Results Preview Edit

Preview Structure-activity relationships

Start again

1 Marks: --/1

Draw the structures of the two molecules labelled as A and B using the JME applet available on the following web page:  
<http://www.molinspiration.com/cgi-bin/properties>

A B

Use the applet to predict the logP values for each molecule and the predicted bioactivity. Use this information to match the following statements.

The presence of a sulphonimide group results in a

Molecule B is a

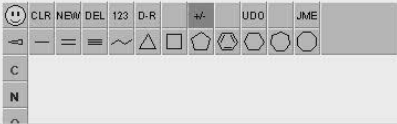
Molecule A is a

The presence of a CF<sub>3</sub> group results in a

Submit

2 Marks: --/1

Draw the zwitterionic structure for glycine using the jme drawing applet available from the link below.  
Draw the structure for the deprotonated version of aspirin using the jme drawing applet available from the link below.



take-the-ride-and-en...zip

Show all downloads...



# Interactive spreadsheets in assessment

1

Marks: -/1

Use the following [Excel spreadsheet](#) to match the following statements.

[This is a simple example question. See the [worksheet](#) by Richard Green for questions relevant to the spreadsheet]

If the average total cost decreases, and all other parameters remain the same

If the chosen output level increases, and all other parameters remain the same

If the average total cost increases, and all other parameters remain the same

Submit

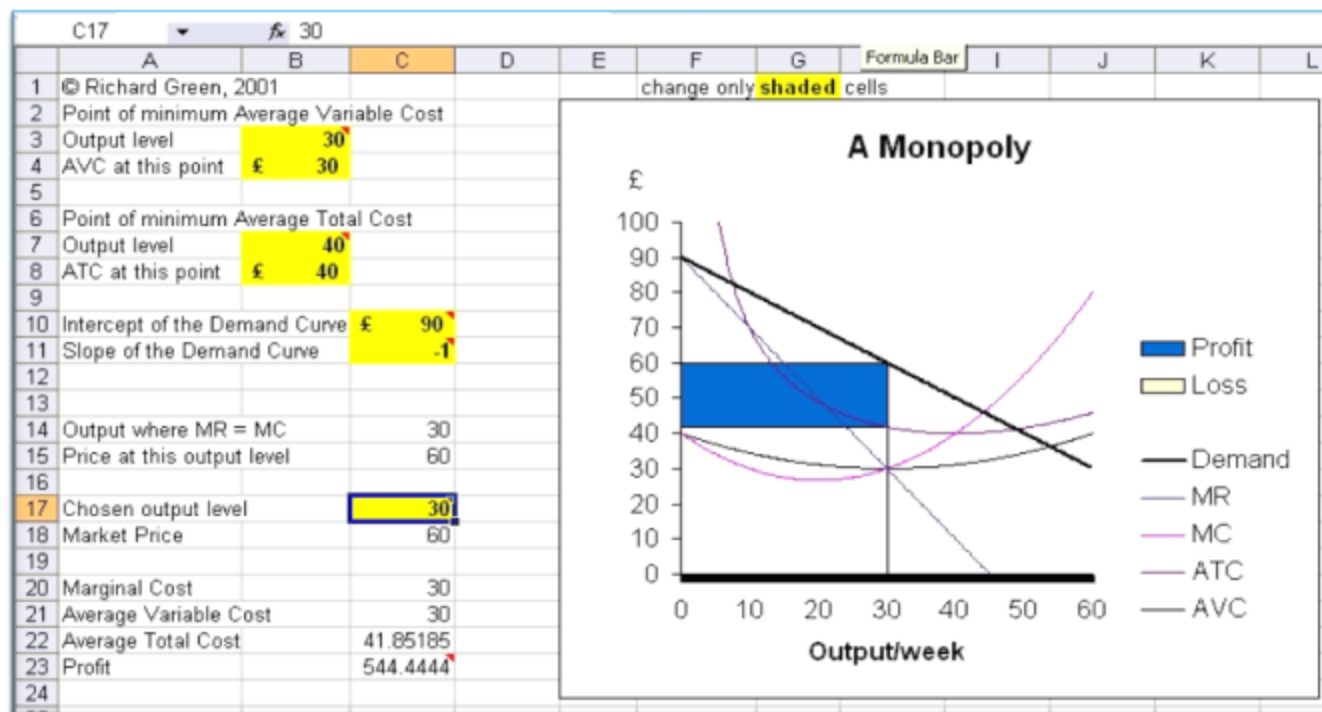
Choose...

Choose...

the profit will decrease

the profit will increase

the marginal cost increases



# QuickTime VR or YouTube videos

1 🗨

Marks: --  
/1

You are required to construct a 500 word argument that either supports or refutes the statement 'Some historians claim that the Bayeux Tapestry is not an historical record of the Battle of Hastings, but rather it is simply Norman propaganda'.

You will need to use this [QuickTime virtual reality link to view the Bayeux Tapestry](#) to assist you in selecting and describing two scenes that you will use as the basis for your argument.

Click on this link to the [assessment rubric](#) to view the marking criteria for this task.

Answer:

You are required to construct a 500 word argument that either supports or refutes the statement 'Some historians claim that the Bayeux Tapestry is not an historical record of the Battle of Hastings, but rather it is simply Norman propaganda'.

You will need to use this



to assist you in selecting and describing two scenes that you will use as the basis for your argument.

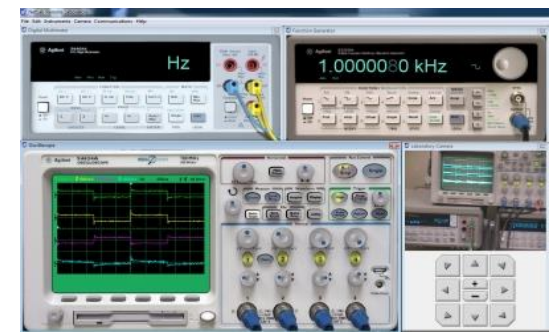
Click on this link to the [assessment rubric](#) to view the marking criteria for this task.

Submit



# Remote Labs

Physical hardware can be connected to the internet. Students can use the equipment 24/7 thus increasing use time (not necessarily to replace actual physical lab time).



RL101: Editing a Numerical question - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.transformingassessment.com/moodle/question/question

RL101: Editing a Numerical question

**General**

Current Category Default for Remote Labs (2) ☒ Use This Category

Save in Category Default for Remote Labs (2)

Question name\* Electromagnetic induction 1

Question text ?

Trebuchet 1 (8 pt) Lang B I U S x<sub>2</sub> x<sup>2</sup>

You are in TEXT MODE. Use the [ <> ] button to go back to WYSIWYG MODE.

<p>What peak voltage is produced across the coil when a voltage of 3.5 is applied to the driving motor?</p>  
<p>Use the remote laboratory experiment shown below to run the experiment and observe the peak voltage produced on the positive side of the scale. Note that the red bars indicate whole even numbers.<br /></p>  
<p>Enter an average of the peak values you have observed into the answer box shown at the bottom. Enter a positive number only.<br /></p><iframe height="1000" frameborder="0" width="950" src="http://kdt-20.karlov.mff.cuni.cz/ovladani\_2\_en.html"></iframe>

Format ? HTML format

Image to display None

Default question grade\* 1

Penalty factor\* ? 0.1

General feedback ?

Trebuchet 1 (8 pt) Lang B I U S x<sub>2</sub> x<sup>2</sup>

Path: ? Submit

**Answer 1**

jsMath

RL101: Remote labs example quiz - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.transformingassessment.com/moodle/mod/quiz/attempt

RL101: Remote labs example quiz

1 ?  
Marks: 1

What peak voltage is produced across the coil when a voltage of 3.5 is applied to the driving motor?

Use the remote laboratory experiment shown below to run the experiment and observe the peak voltage produced on the positive side of the scale. Note that the red bars indicate whole even numbers.

Enter an average of the peak values you have observed into the answer box shown at the bottom. Enter a positive number only.

**Electromagnetic induction**

View of the experiment

Electromotive voltage on the rotating coil

mV

8  
4  
0

time (s) (1 red division is 1 s)

Voltage on the driving motor

Stop I II III IV 3.2 V

Magnetic induction: 17 mT +/- 1mT  
Number of loops in coil: 33  
Coil size: 18,2 mm x 32,1 mm +/- 0,5 mm

Data recording

13 art of record log of record

Choice of the measurement

mV

4  
2  
0

1 2 3 4 5 6

Import as text separated by tabulator Export for Excell

Answer:

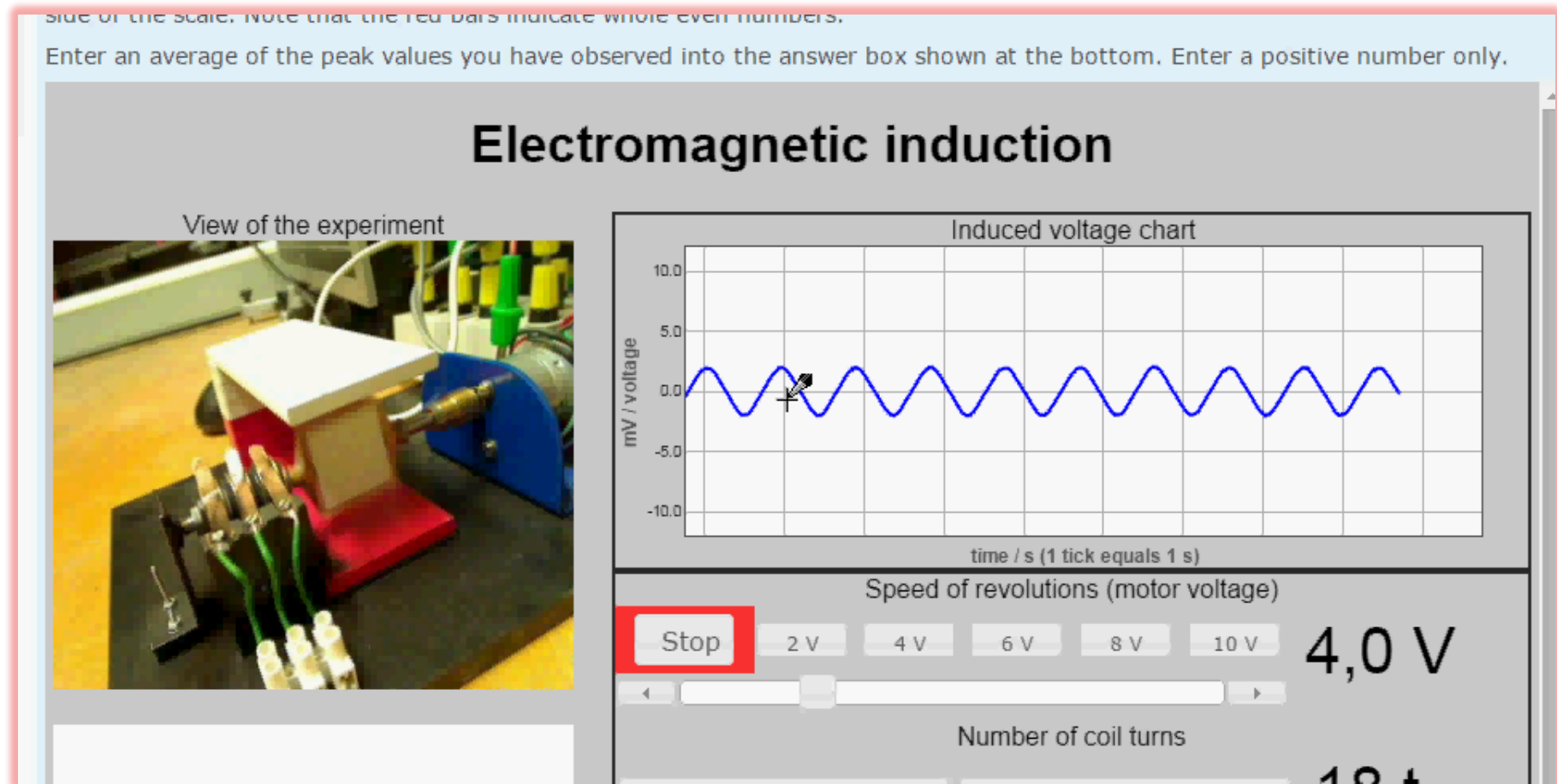
Save without submitting Submit all and finish

Page: 1 2 (Next)

jsMath

# Remote Labs

We can rethink the type of questions we ask if students have access to live data and resources within the assessment environment





# Fablusi – Role-play software

- more authentic
- need to interact with others
- explore consequences
- can run in real time

The screenshot shows the Fablusi web interface for a role-play simulation titled "Venezuela: Justice and Rights in Development". The main content area is light green and contains a header with the title and a sub-header "New Scenarios, Old Problems?". Below this is a dark green bar labeled "Presidential Palace". Underneath, there are two buttons: "Meeting Room 2" and "To The President". Below these is another dark green bar labeled "Meeting Room 2" with a sub-header "Opposition Meetings with Govt. Representatives". Below this bar is a chat log showing two messages from Alfredo Pena: "Sorry Mr. President, but I don't feel like it!" and "Hi everyone Hello!". To the right of the chat log are two "Reply" buttons. At the bottom of the main content area is a copyright notice: "Copyright ©2004 Dr. Helen Hintjens, University of Wales, Swansea & Roni Linser, Fablusi P/L Credits Additions and Modifications ©2006 Dr Helen Hintjens Institute of Social Studies & Roni Linser Fablusi P/L Powered by Fablusi™ the role play simulation platform for experience-based learning and training." On the right side of the interface is a dark green sidebar with several sections: "Welcome" with links to "Alfredo Pena", "Main Page", and "Quit"; "Tasks to Do" with links to "Scenario", "Read Role Profiles", "Submit RoleProfile", "Upload", "Notepad", and "Chat"; "Forums" with links to "Presidential Palace" and "PROVEA"; "Media" with links to "Venezolana de Television", "El Nacional Newspaper", and "CNN"; and "Resources" with links to "General Instructions", "The Game", "Web Resources and Links", "Timeline", "Role List", and "Help".

**Venezuela: Justice and Rights in Development**  
**New Scenarios, Old Problems?**  
**Presidential Palace**

**Meeting Room 2** **To The President**

**Meeting Room 2** **Opposition Meetings with Govt. Representatives**

8 May 2006 19:25:29 Alfredo Pena  
Sorry Mr. President, but I don't feel like it!  
8 May 2006 19:15:34 Alfredo Pena Hi everyone  
Hello!

**Reply** **Reply**

Copyright ©2004 Dr. Helen Hintjens, University of Wales, Swansea  
& Roni Linser, Fablusi P/L  
Credits  
Additions and Modifications ©2006 Dr Helen Hintjens Institute of  
Social Studies &  
Roni Linser Fablusi P/L  
Powered by **Fablusi™** the role play simulation platform for  
experience-based learning and training.

**Welcome**  
[Alfredo Pena](#)  
[Main Page](#)  
[Quit](#)

**Tasks to Do**  
[Scenario](#)  
[Read Role Profiles](#)  
[Submit RoleProfile](#)  
[Upload](#)  
[Notepad](#)  
[Chat](#)

**ComTools**  
[SimMail™](#)

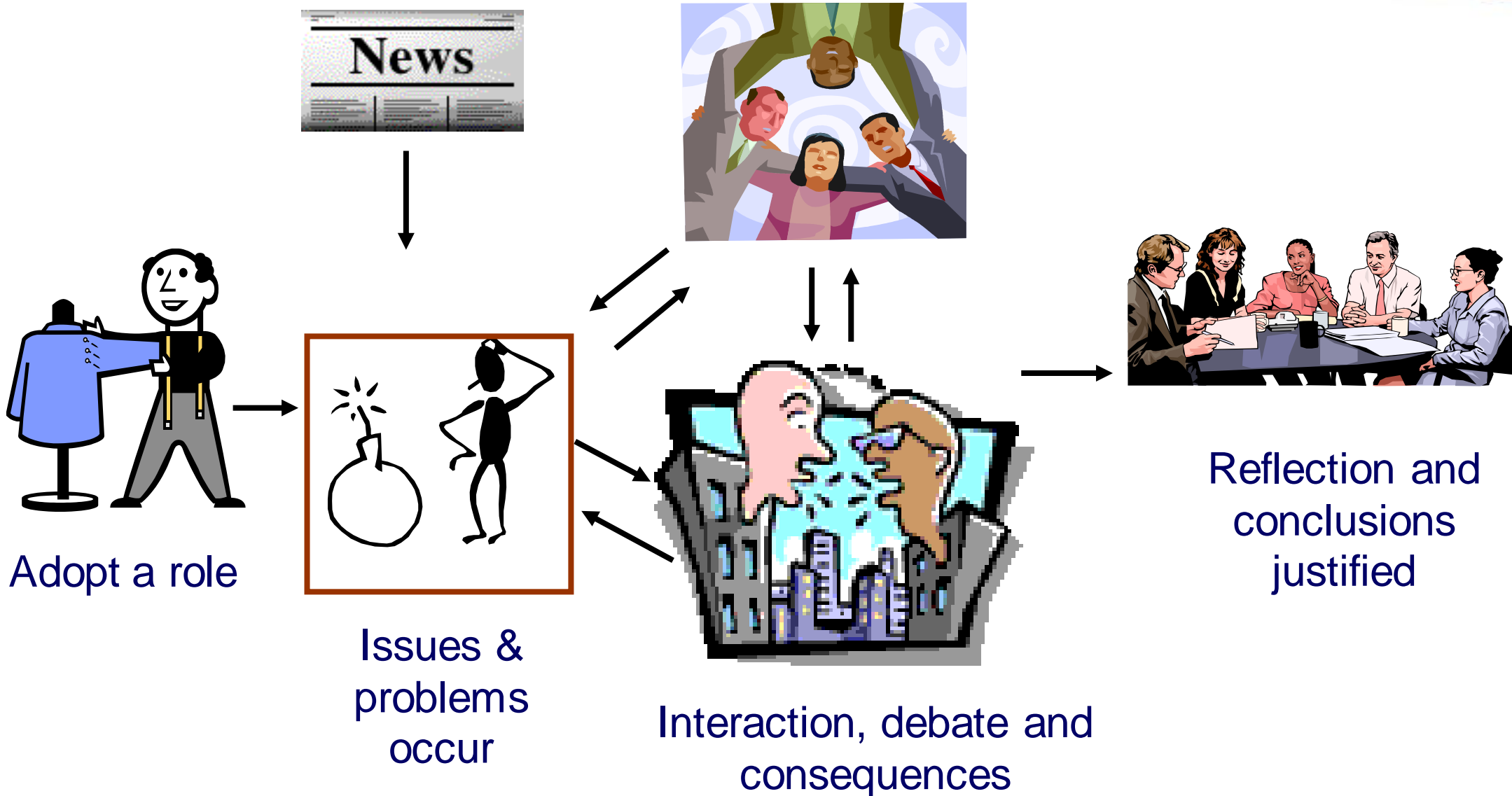
**Forums**  
[Presidential Palace](#)  
[PROVEA](#)

**Media**  
[Venezolana de Television](#)  
[El Nacional Newspaper](#)  
[CNN](#)

**Resources**  
[General Instructions](#)  
[The Game](#)  
[Web Resources and Links](#)  
[Timeline](#)  
[Role List](#)  
[Help](#)

<http://www.fablusi.com>

# What Happens in a Role Play?





# What Happens in a Role Play?

[COURSES](#) > [MEKONG ESIMULATION \(2005\)](#) > [ASSIGNMENTS](#)

[EDIT](#) [VIEW](#)



## **Assessment Overview**

Both the way that you do things (eg teamwork, participation) during the eSim as well as what you produce (eg reports) will be assessed. The various assessment items and deadlines are given here.



## **Quizzes**

Two quizzes have been developed covering separate aspects of the Mekong e-Sim that will need to be completed. They are designed to introduce participants to the Mekong region and the various roles involved in the Mekong e-Sim. The quizzes will become available for a limited period of time in accordance with the assessment timetable.



## **Role Profile:Strategy**

Role Profile:Strategy will help your group to develop a shared understanding of the policies and responsibilities of your role and of the strategies you will implement throughout the e-Sim, as well as critically identifying differences in your interpretation of the persona and the context you are working in.



## **Public Inquiry Submission Paper**

The public inquiry submission papers allow the development of a deeper understanding of a specific issue and also provide the basis for each group's initial submission to the public inquiries.



## **Participation**

Your participation in the e-Sim is fundamental to achieving successful learning outcomes from the e-Sim. Due to differences in the various persona and how they would normally participate in these interactions there are a number of different ways you will be assessed.




## **Debriefing Report**

The aim of the debriefing report is document your learning about the complexity of environmental decision making from the e-Sim. It draws together your experiences and reflections.

# Scenario based learning - SBLi


Back to Scenario Launcher Restart Scenario Notes Help About SBLi Server produced by CBIL, UQ



Marketing - the way to success



The Marketing Dilemma



## Smart Marketing


- the way to success

Current view :: General Locations >>Marketing - the way to success >>Introduction to your scenario Up a level

Possible actions for >>Marketing - the way to success

actions collections

Introduction to your scenario




## Smart Marketing

- the way to success

### Scenario Introduction

Action

Your name is Felicity Dawson . You and your partner, Jack



own Wundaroo Flowers which is located near Cedarville, in the Sunshine Coast hinterland of south-east Queensland and approximately 100 km from Brisbane. The farm is 15 hectares in area of which five hectares are planted to waxflowers and rice flowers. Flowers are grown on well-drained, slightly acid sandy loam soil. The farm has a mild and frost free climate and a reliable supply of water for irrigation. This results in a good growth rate for the flowers. At the moment it is busy as it is the flowering season which starts in June and goes to October.



Time spent: 00:00:00 Money spent: 0



http://www.transformingassessment.com

[Dashboard](#) [Content](#) [Structure](#) [Appearance](#) [People](#) [Modules](#) [Configuration](#) [Reports](#)

Hello **gcrisp01** [Log out](#)

### Main Navigation

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- [Bibliography](#)
- [Contacts](#)
- [e-Assessment Examples \(1.9\)](#)
- [e-Assessment Examples \(2.3\)](#)
- [e-Assessment Examples \(2.8\)](#)

### Tools and Systems

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- [iPeer](#)
- [Mahara](#)
- [MediaWiki](#)
- [Moodle](#)
- [NanoGong](#)
- [OpenSimulator](#)
- [PhpBB](#)
- [QuizHUD](#)
- [SBL Interactive](#)
- [Second Life](#)
- [Sloodle](#)

## Rethinking assessment in a participatory digital world - Assessment 2.0

Transforming Assessment is about exploring the use of information and communications technology to enhance the assessment of student learning in higher education (e-assessment).

### News!

- [Call for e-Assessment papers for special issue: Universities and Knowledge Society Journal](#)
- [We have joined forces with the Australasian Society for Computers in Learning in Tertiary Education \(ASCILITE\) as a Special Interest Group \(SIG\) for e-Assessment; new activities coming soon.](#)


### Transforming Assessment Webinars

Update! The 2015 series now live - see the upcoming sessions now!

- [Schedule and session details](#) - further sessions will be added as they are confirmed.
- [How to participate in sessions](#)
- [Technical help & FAQs for webinars](#)
- [Recordings of past events](#) from 2010 to 2014 are available in multiple formats.







**Time to next webinar**  
**24:03:16:33**  
Day Hr Min Sec

### eAssessment Scotland & Transforming Assessment join online conference



**eAssessment Scotland 2014**

Final answer? The question of summative eAssessment  
Day Conference: 5<sup>th</sup> September, University of Dundee  
Online Conference: 8-19<sup>th</sup> September



### User menu

- [My account](#)
- [Log out](#)

### Regional Managers Early Access

1 April 2015: [Virtually Enhanced Language Teaching](#)

### Upcoming Events

2015: [Virtually Enhanced Language Teaching](#)  
1 April 2015

2015: [Development of 4D farms to improve student learning and safety](#)  
6 May 2015

2015: [Webinar 3 June TBA](#)  
3 June 2015

2015: [Webinar 1 July TBA](#)  
1 July 2015

2015: [Webinar 5 August TBA](#)  
5 August 2015

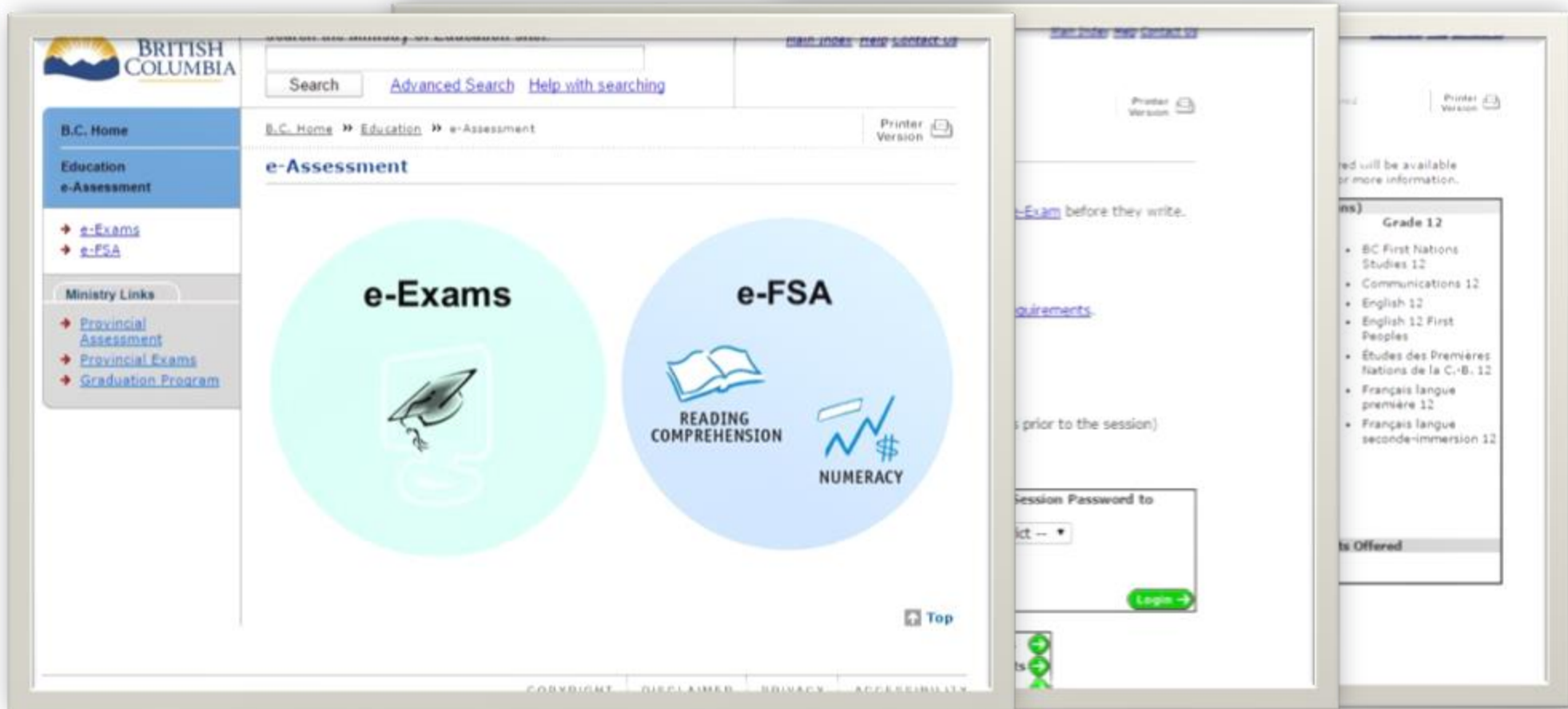
## Assessment responses

**convergent** type, in which one correct answer is expected, and **divergent** responses, in which the answer depends on opinion or analysis (Torrance et al., 2001)

**convergent assessment** has its origins in mastery-learning models and involves assessment of the student by the master-teacher

**divergent assessment** is often associated with a constructivist view of learning, where the teacher and student engage collaboratively within Vygotsky's (1986) zone of proximal development

<https://www.bced.gov.bc.ca/exams>





<https://www.bced.gov.bc.ca/exams>

The screenshot displays the 'e-Exams - Secure Login' page on the British Columbia Education e-Assessment website. The page features a search bar at the top, a navigation menu on the left, and a main content area with instructions and a login form.

**Navigation Menu (Left):**


- BC Home
- Education
- e-Assessment
  - e-Exams
    - Pre-Administration System Test
    - e-Exam Samples
    - e-Exams Live
    - e-Exam Adaptations
    - e-Exam Marking
  - e-PSA
- General Information
  - Administration Information
  - Cheating
  - Documentation and Manuals
  - Subjects Offered in e-Exam Format
  - Training Materials and Videos
- Information for Technicians
  - Downloads and Computer/Browser Requirements
  - Documentation and Manuals

**Main Content Area:**

**Search:** Search [Advanced Search] [Help with searching]

**Breadcrumb:** B.C. Home » Education » e-Assessment » e-Exams » Login

**e-Exams - Secure Login**

 Students are encouraged to complete a [Sample e-Exam](#) before they write.

**Instructions**

- Please ensure each workstation meets the [computer requirements](#).
- Review the e-Exam [documentation and manuals](#).

**District:** Select your school district from the drop down

**PEN:** Enter the student's PEN

**Session Password:** Enter the appropriate password (Your principal will be notified of the passwords prior to the session)

**Login**




Please enter your Personal Education Number (PEN) and Session Password to begin the exam

**District:** -- Please select your school district --

**PEN:** [Text Input Field]

**Session Password:** [Text Input Field]

**Login** [Green Arrow Button]

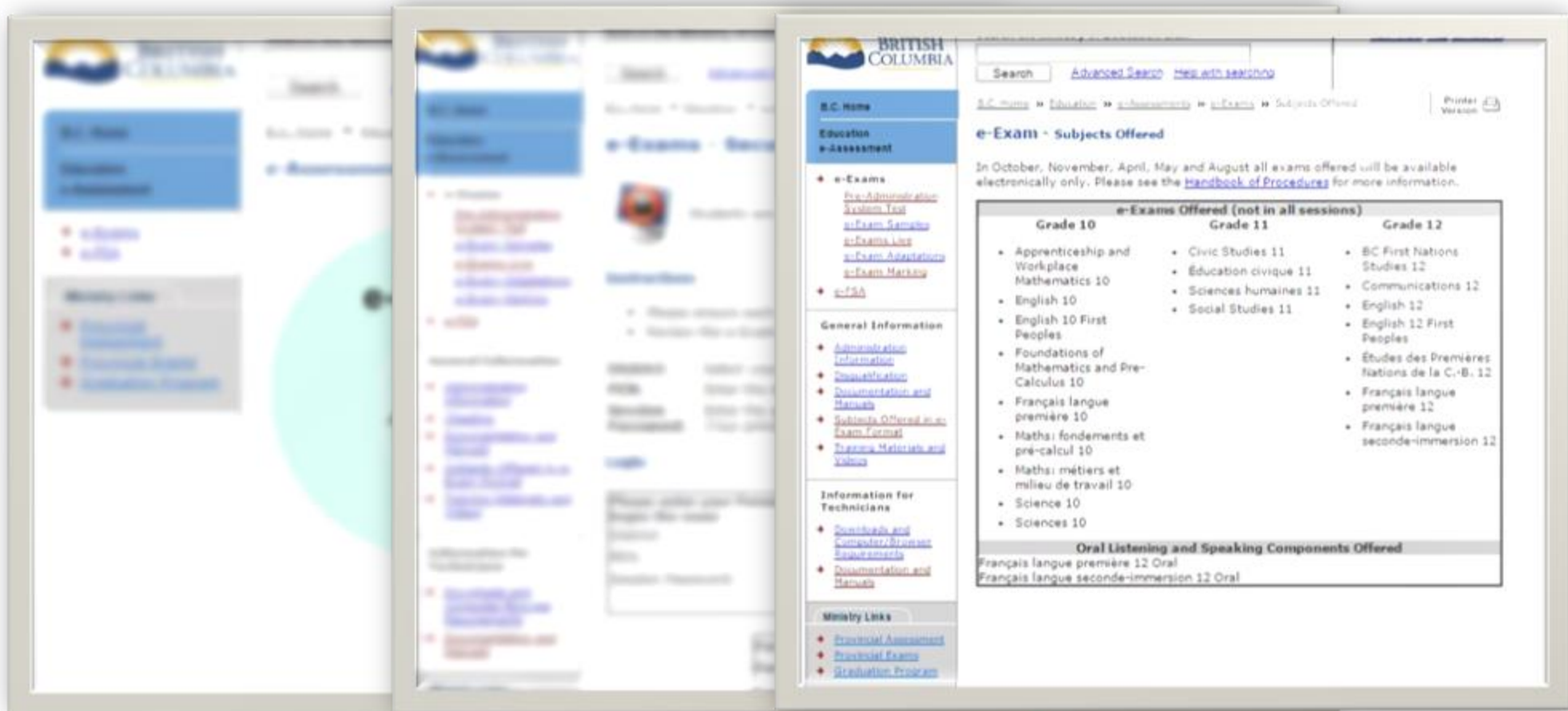
**For Administrators:** [Walk-in Students](#)   
[For Administrators:](#) [Supervisor Reports](#)   
[For Administrators:](#) [Supervisor Reports](#) 

**Subjects Offered (Right Panel):**

**Grade 12**

- BC First Nations Studies 12
- Communications 12
- English 12
- English 12 First Peoples
- Études des Premières Nations de la C.-B. 12
- Français langue première 12
- Français langue seconde-immersion 12

<https://www.bced.gov.bc.ca/exams>



# Dr Mathew Hillier – University of Queensland

<http://www.transformingexams.com>



## TRANSFORMING EXAMS

A Scalable Examination Platform For BYOD Invigilated Assessment

HOMEPAGE

DOWNLOADS

GUIDES

RESEARCH

CONNECT



### DOWNLOADS

Download the e-Exam software.



### GUIDES

e-Exam guides for students, academics, invigilators and administrators, plus technical how-tos.



### RESEARCH

Theory, research data, publications and presentations.



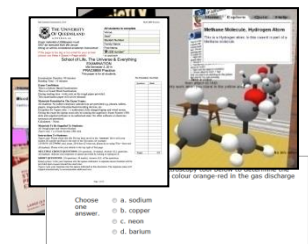
### CONNECT

Connect to the project team, get involved and stay up to date.



# e-Exam Workflow

Set-up: prepare exam learning materials



Academic creates exam learning material

Create master USB (tested)



USBs duplicated per student



Pre-session:

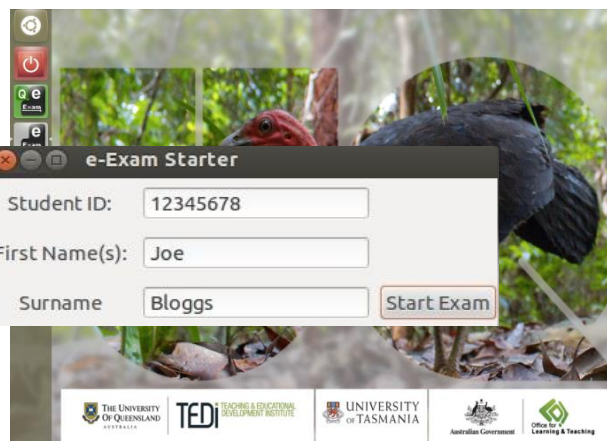
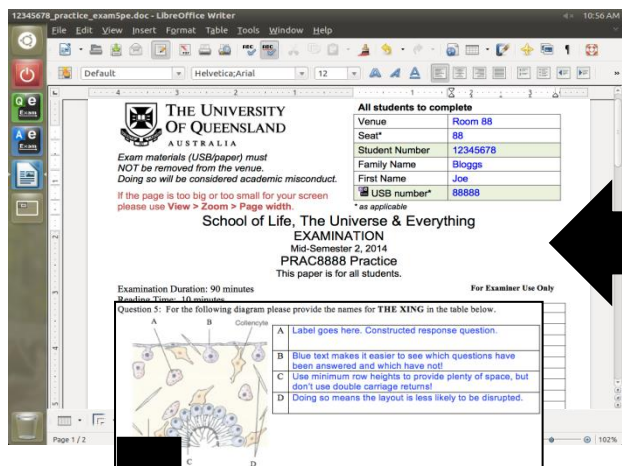
Student laptop setup & practice.



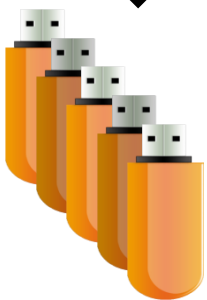
Exam room use



Ubuntu Live USB.  
Libre Office,  
Moodle etc



Post session: retrieve responses and assessment



Collect USBs (responses)



Responses retrieved from USBs.



Collated e-responses sent to academic.



1. Students enter room
2. Given USB
3. Boot laptop
4. Do exam
5. Return USB
6. Leave room

Question types used: short answer/essay, matching, construct a table, label a diagram/image (by filling a table). Manual marking.

Question 2. Match the following host-MOTA relationship terms (I-IV) to the most specific description (a-f below).

[2 marks]

*Possible descriptions:*

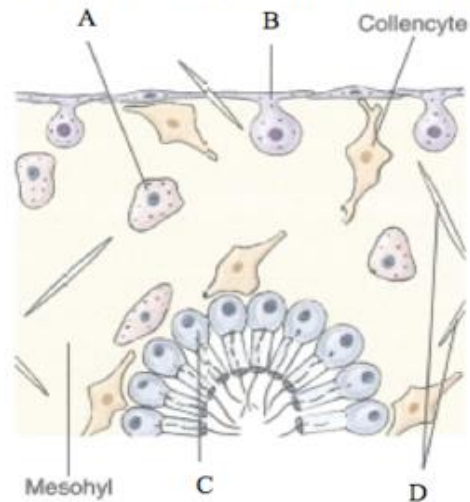
- a) Mauris id mi id orci interdum semper.
- b) Sed eu neque ut est dignissim fringilla.
- c) Vivamus in dolor euismod, luctus libero vel, pulvinar quam.
- d) Mauris vehicula eros a viverra pellentesque.
- e) Curabitur eu mi at nibh commodo varius non non lorem.
- f) Aenean eget orci porta, malesuada lorem sit amet, rutrum augue.

*Please write or type the letter of the descriptions listed above into the answer column below to indicate the matching term.*

Answer a to f.	Terms
<u>f</u>	I. <u>Paxogen</u>
<u>a</u>	II. <u>Sitabosis</u>
<u>c</u>	III. <u>Fakeasalism</u>
<u>e</u>	IV. <u>Wrongagelesis</u>

Question types used: short answer/essay, matching, construct a table, label a diagram/image (by filling a table). Manual marking.

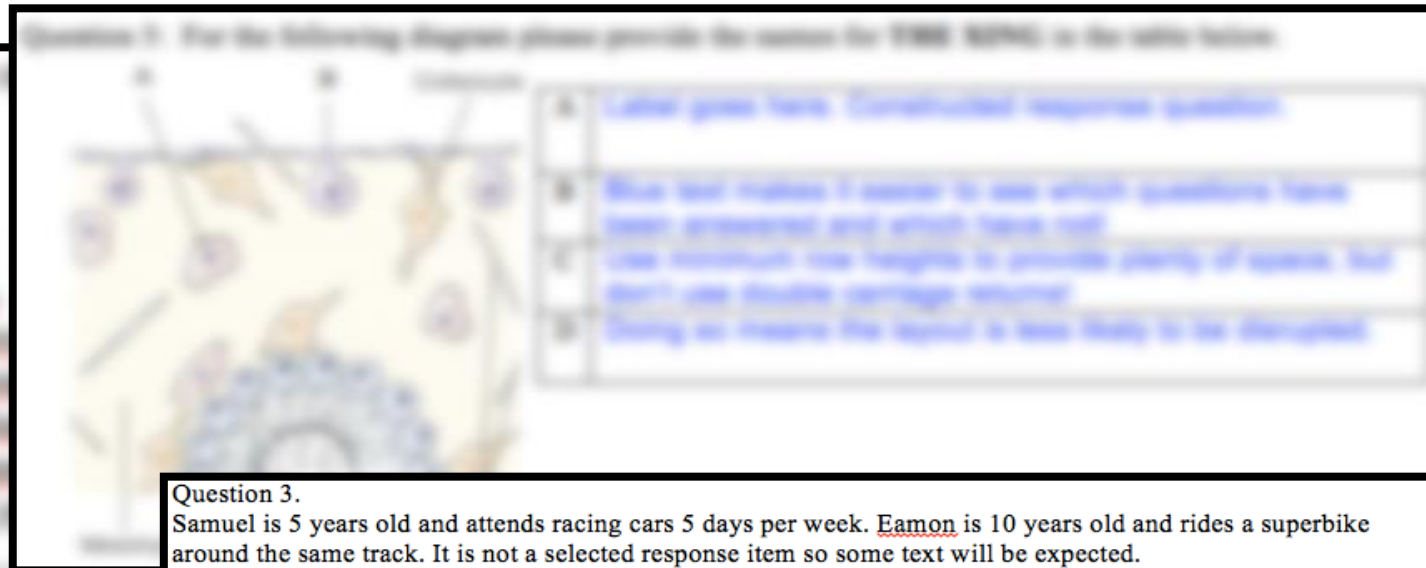
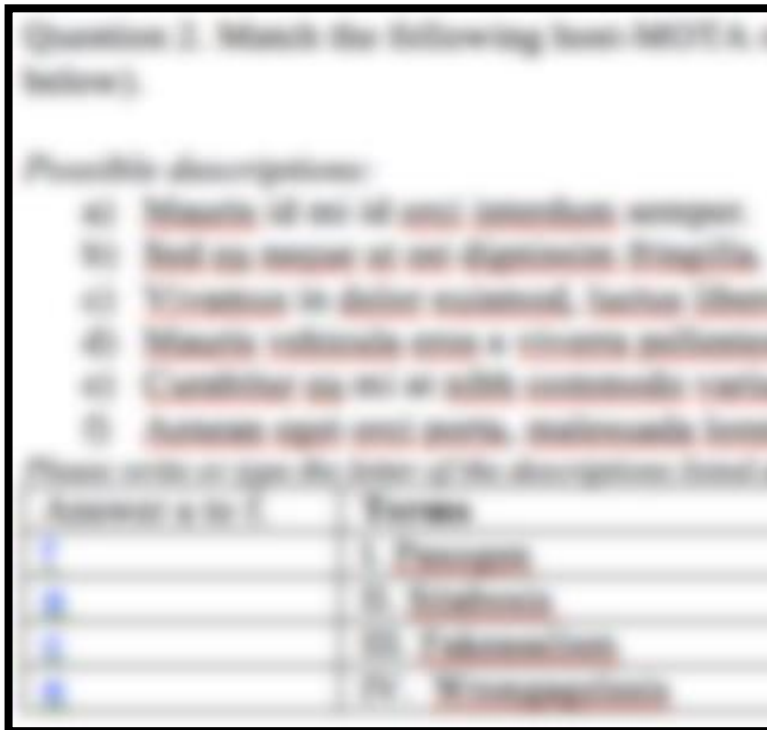
Question 5: For the following diagram please provide the names for **THE XING** in the table below.



A	Label goes here. Constructed response question.
B	Blue text makes it easier to see which questions have been answered and which have not!
C	Use minimum row heights to provide plenty of space, but don't use double carriage returns!
D	Doing so means the layout is less likely to be disrupted.



Question types used: short answer/essay, matching, construct a table, label a diagram/image (by filling a table). Manual marking.



Question 3.

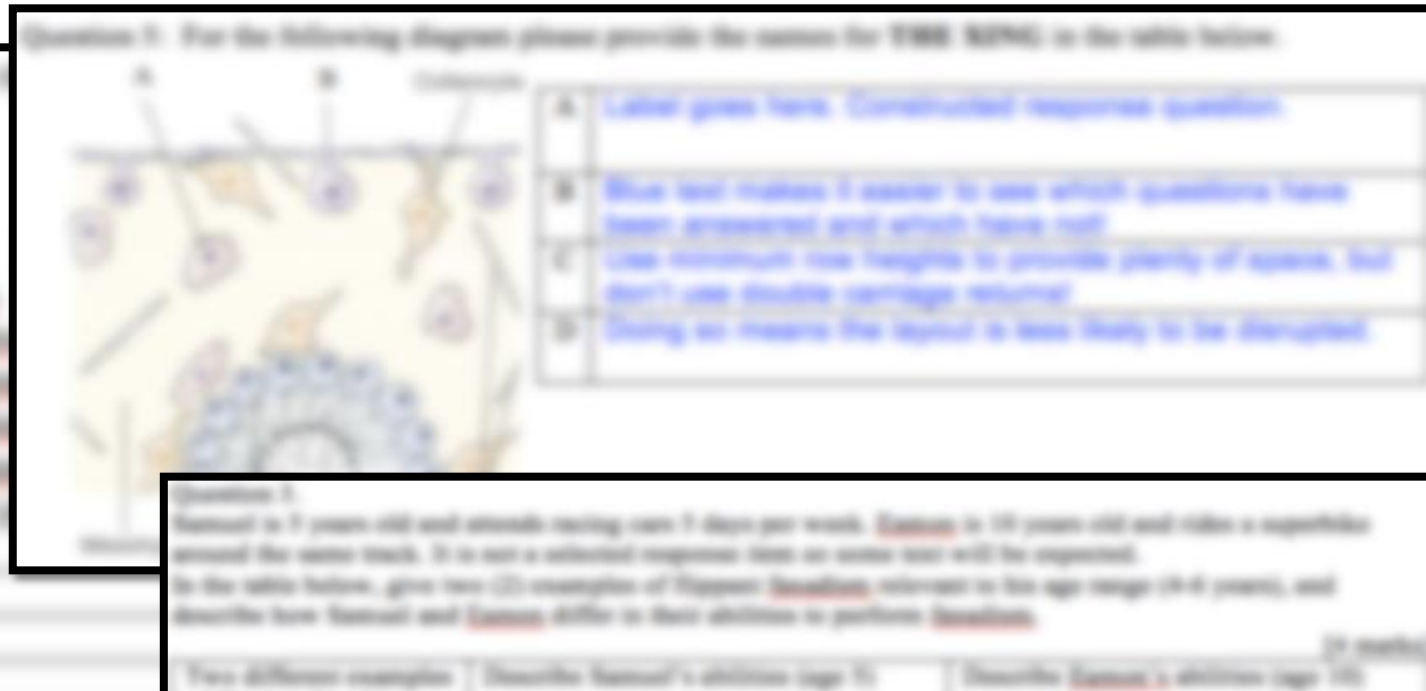
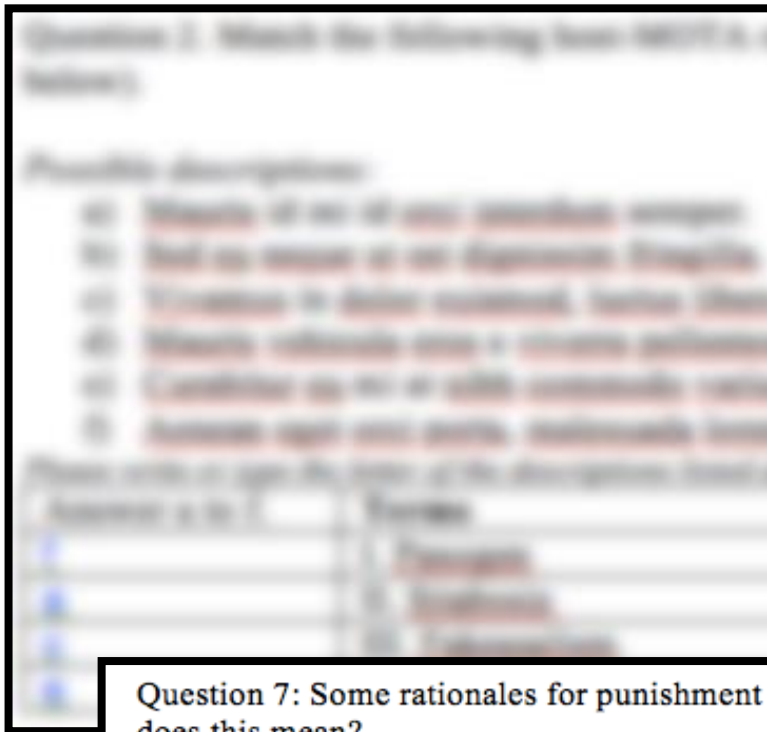
Samuel is 5 years old and attends racing cars 5 days per week. Eamon is 10 years old and rides a superbike around the same track. It is not a selected response item so some text will be expected.

In the table below, give two (2) examples of flippant faxadism relevant to his age range (4-6 years), and describe how Samuel and Eamon differ in their abilities to perform faxadism.

[4 marks]

Two different examples of flippant <u>faxadism</u> (one per row)	Describe Samuel's abilities (age 5)	Describe <u>Eamon's</u> abilities (age 10)
Type here	Minimum heights set for both rows	
		More details about setting heights appear later in these examples.

Question types used: short answer/essay, matching, construct a table, label a diagram/image (by filling a table). Manual marking.



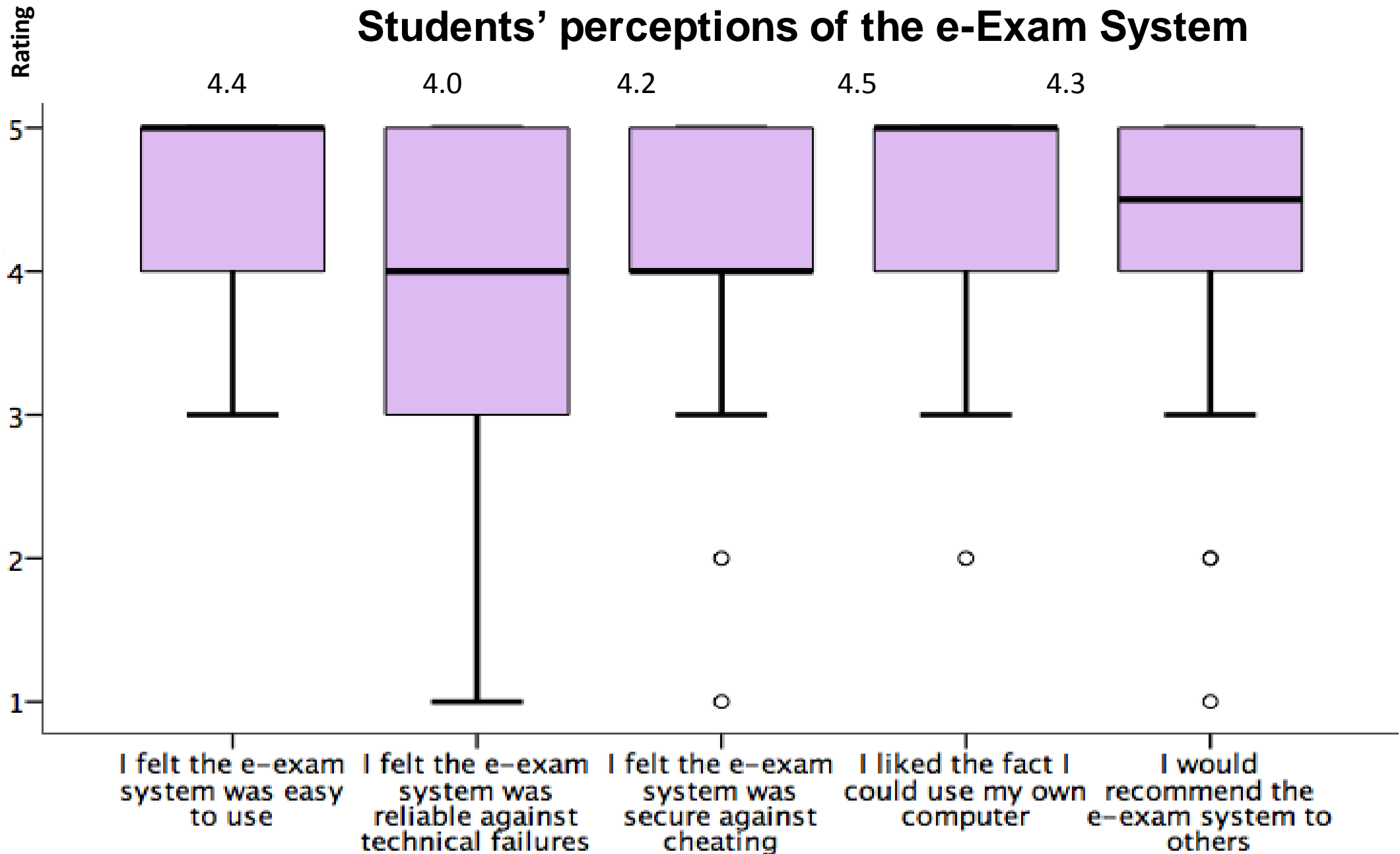
Question 7: Some rationales for punishment are **XEZTAR**-oriented and some are **PEDLAR**-oriented. What does this mean?

[3 marks]

*Please write / type your response inside the box below.*

The student types their answer here. In this example the question and response area are placed in a two row table. The response table row is created with a single carriage return inside. The row or cell has a minimum height set (by dragging the bottom border). By using a single carriage return and a minimum height cell instead of successive carriage returns to set the box height, the next question will be less likely to be disrupted when students type their responses. The initial size of the box should indicate the desired length of the response. The box will automatically expand when it gets full.

# Uni Queensland 2014 Trial Results – User Feedback



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



# The Future: Post-paper exams

