# Educational Advantages of Computer-based Examination

Geoffrey Crisp

RMIT UNIVERSITY

# Learning and assessment of 21st century skills

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

University of Melbourne
http://atc21s.org

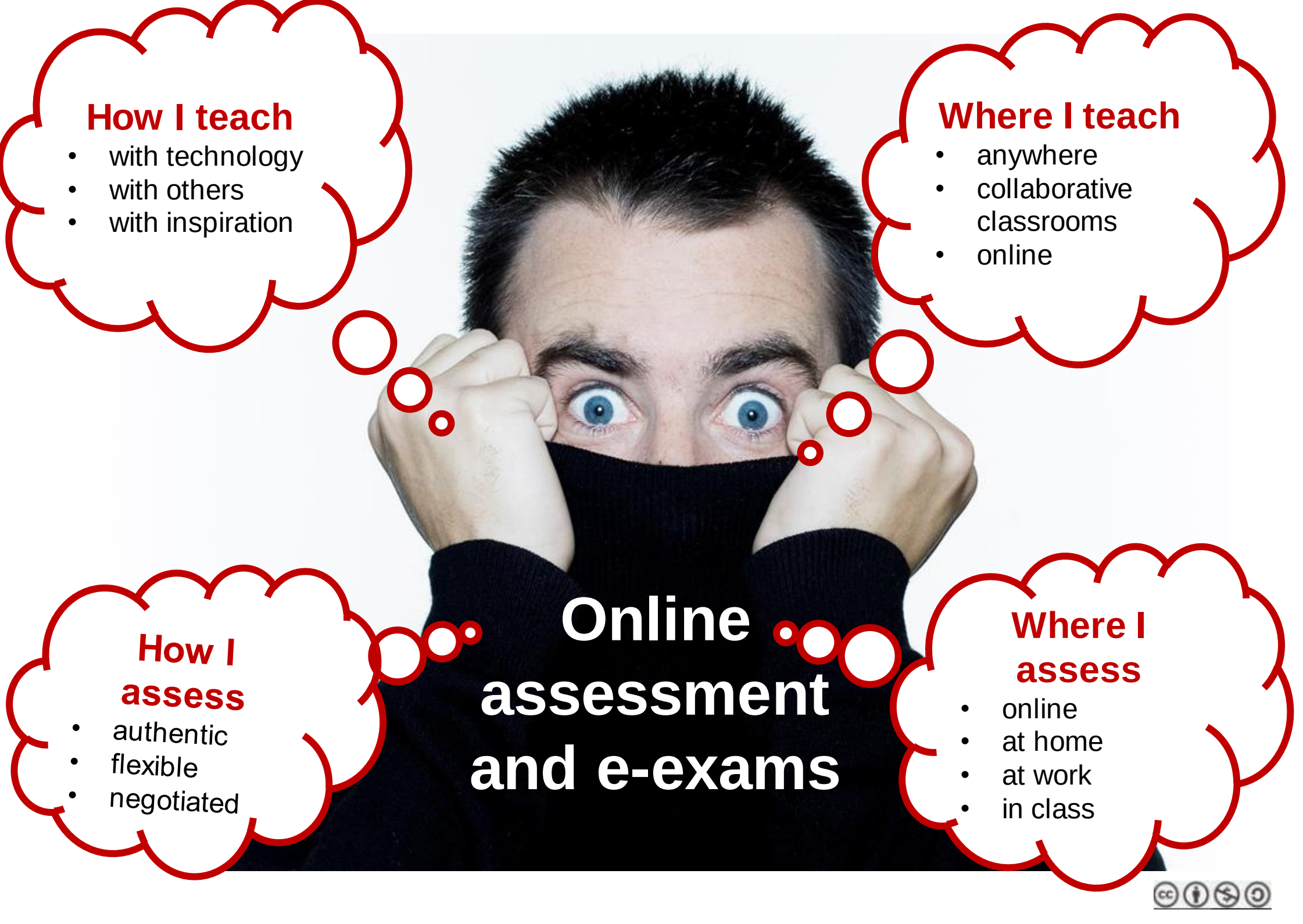
# Is this your learning and assessment space?

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

Teaching spaces determine assessment spaces

# Is there a difference?

## Does this learning space foster 21st century skill development

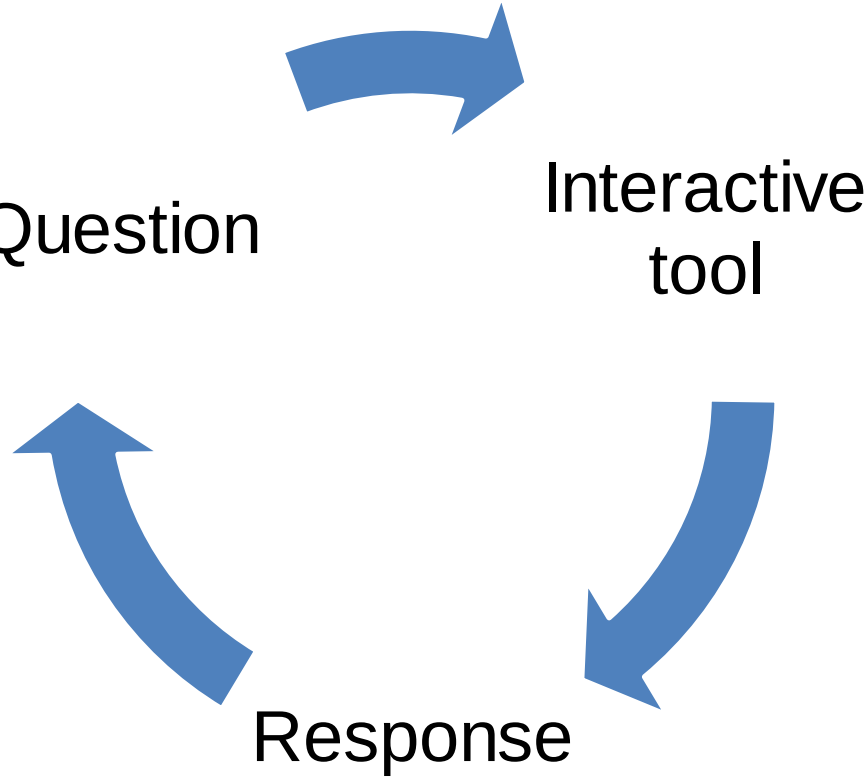

How I teach
• with technology
• with others
• with inspiration
Where I teach
• anywhere
• collaborative classrooms
• online
Online assessment and e-exams
How I assess
• authentic
• flexible
• negotiated
Where I assess
• online
• at home
• at work
• in class

# 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

Steve Wheeler, University of Plymouth, 2011

# Interactive online assessment design

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



# Quizzes with interactive tools

1

Marks: --/1

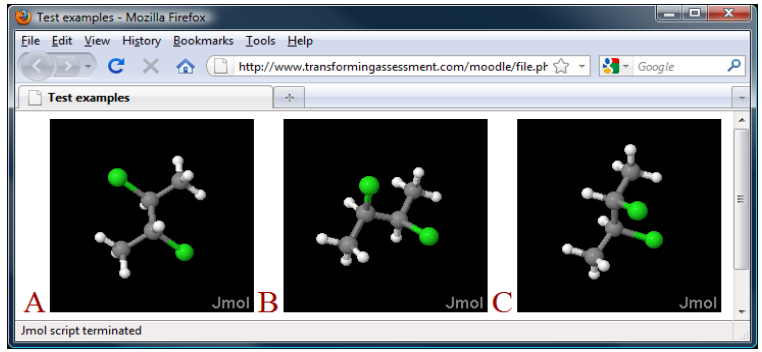
Which structure shown below represents meso 2,3-dichlorobutane, A, B or C?

[Click on the text below to open a window with the three choices]

Three structures, A, B and C

Answer:

Submit




Question 2

Not complete

Marked out of 1.00

Flag question

Edit question

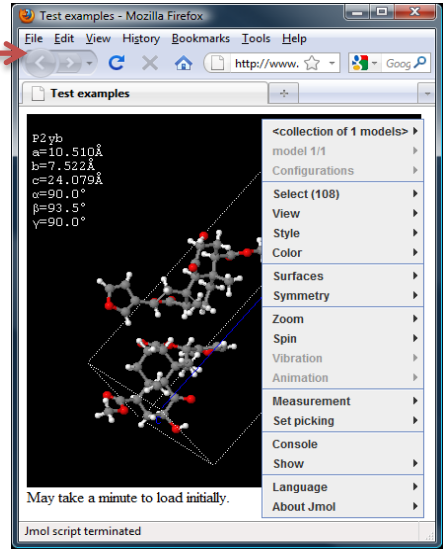
Use the JSmol tool to view the structure of the presented molecule. Use the display to match the following statements.

There are 7 stereogenic centres in the molecule — Choose...

There is evidence for an intramolecular hyrdogen bond — Choose...

There is evidence for an intermolecular hyrdogen bond — Choose...

Check




Students interact with online tools to investigate concepts to construct a response

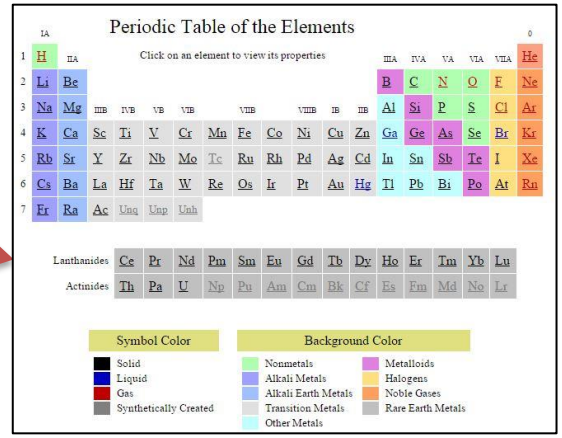
Use the Periodic Table below to find the element that has the highest first ionization potential

Periodic Table

Select one:

- A. Cl
- B. F
- C. P
- D. Li
- E. K
- F. Ga
- G. Rb

Check



# Quizzes with interactive tools

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 | Choose... ▾ |
| The halogen with the highest first ionization potential is | Choose... ▾ |
| The alkali metal with the lowest first ionization potential is | Choose... ▾ |
| The halogen with the lowest first ionization potential is | Choose... ▾ |

Check

# Quizzes with interactive tools

RMIT University | Melbou | Progress Report - geoffre | RMIT University - Calenda | Pricing | Prezi | CHEM01: Structure-activit | Calculation of molecular

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

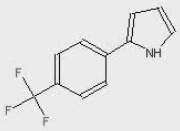
Start again

1

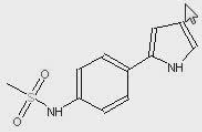
Marks: --/1

Draw the stuctures 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 | better GPCA ligand compared to the other molecule |
| Molecule B is a | lower logP value |
| Molecule A is a | worse GPCA ligand compared to the other molecule |
| The presence of a $CF_3$ group results in a | lower logP value |

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.

jsMath

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

Show all downloads...

# Interactive spreadsheets in assessment

**1**

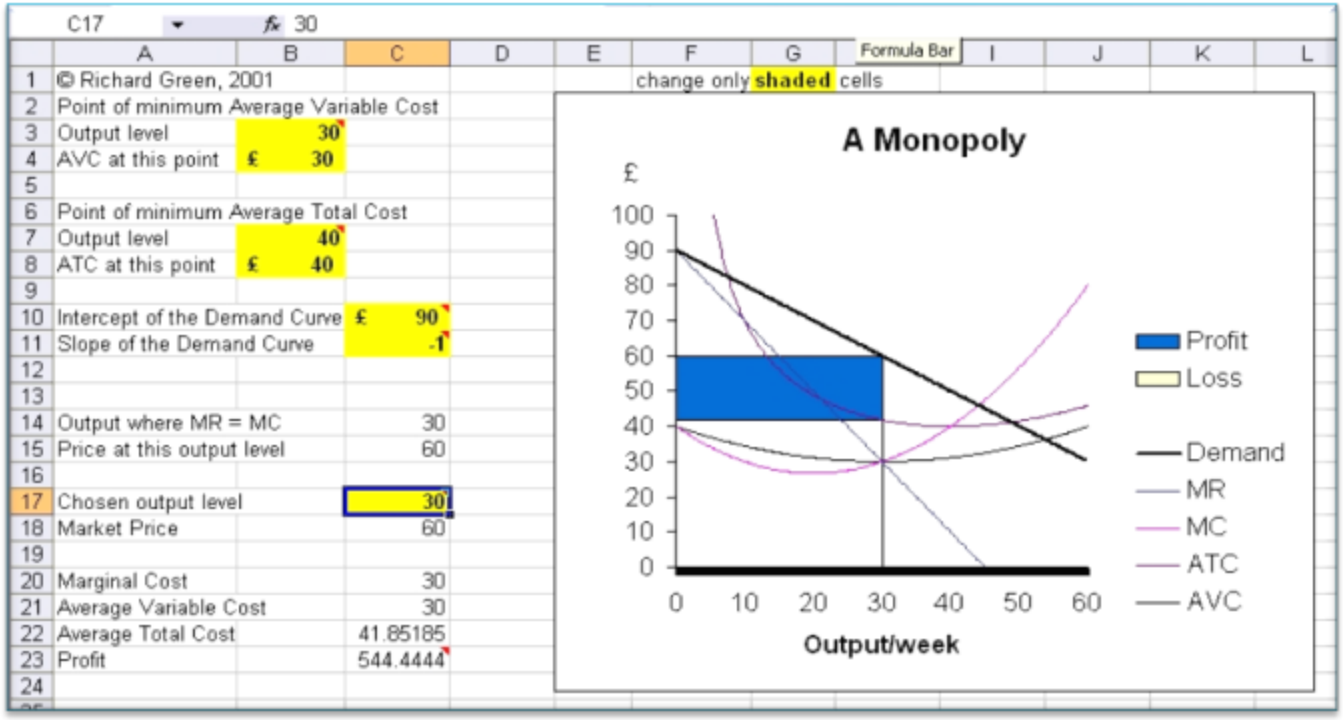
Marks: --/1

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 | Choose... |
| If the chosen output level increases, and all other parameters remain the same | Choose... / the profit will decrease / the profit will increase / the marginal cost increases |
| If the average total cost increases, and all other parameters remain the same | |

Submit



# 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

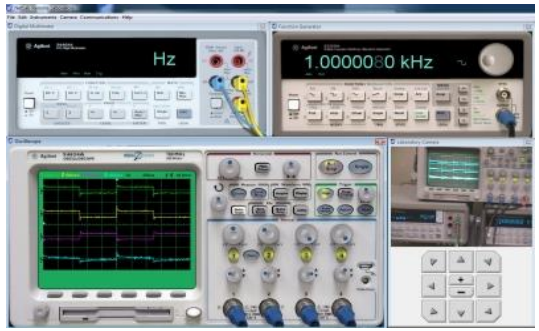
to assist you in selecting and describing two scenes that you will use as the basis for your argument.

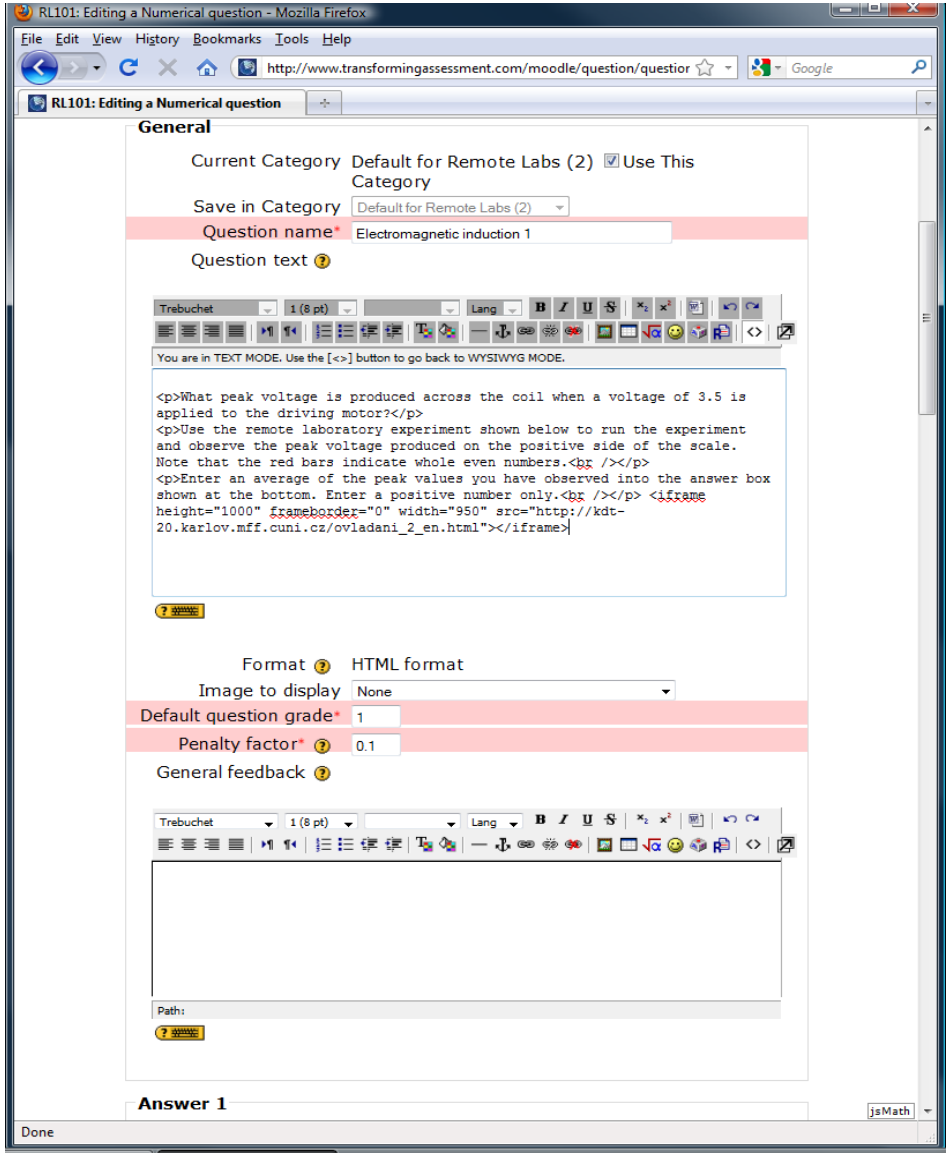
Click on this link to the assessment rubric to view the marking criteria for this task.

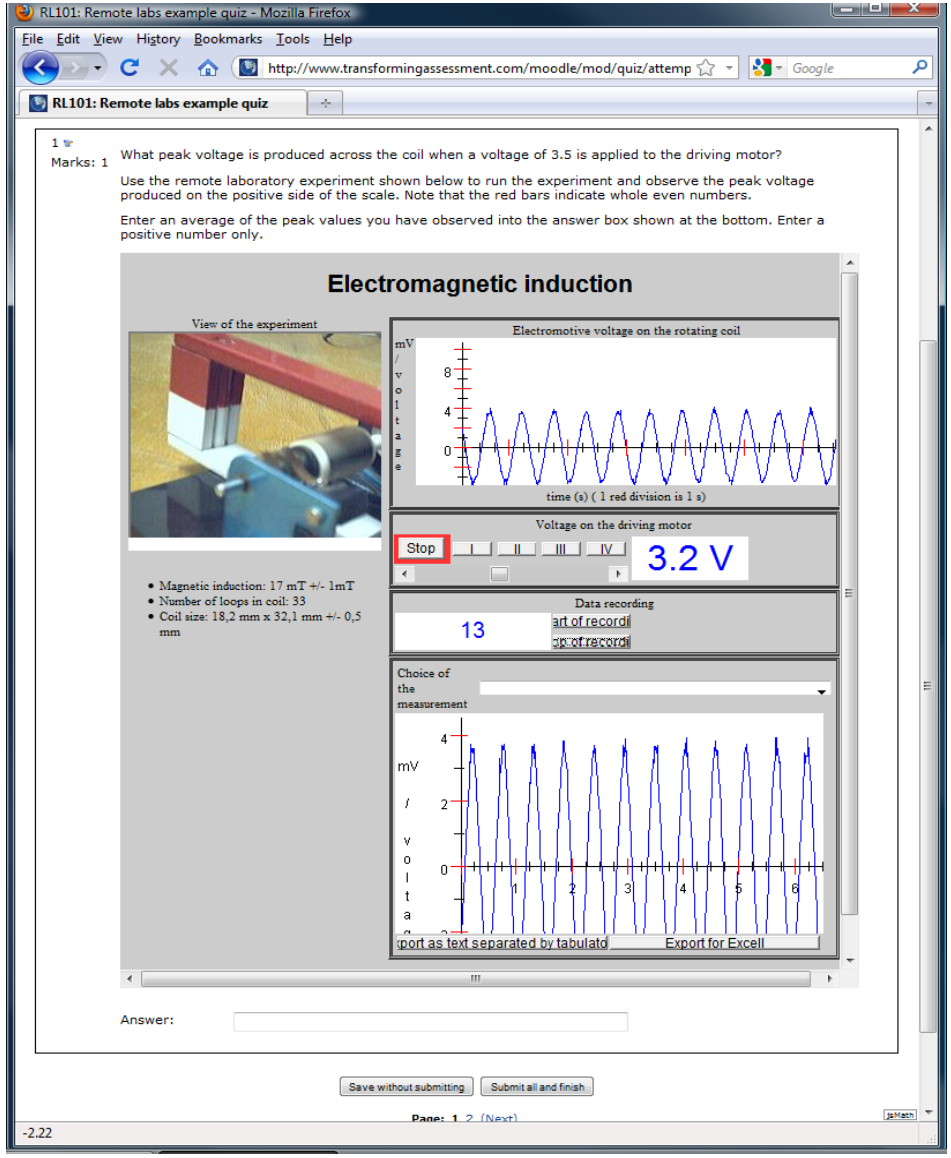
Submit

# 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).

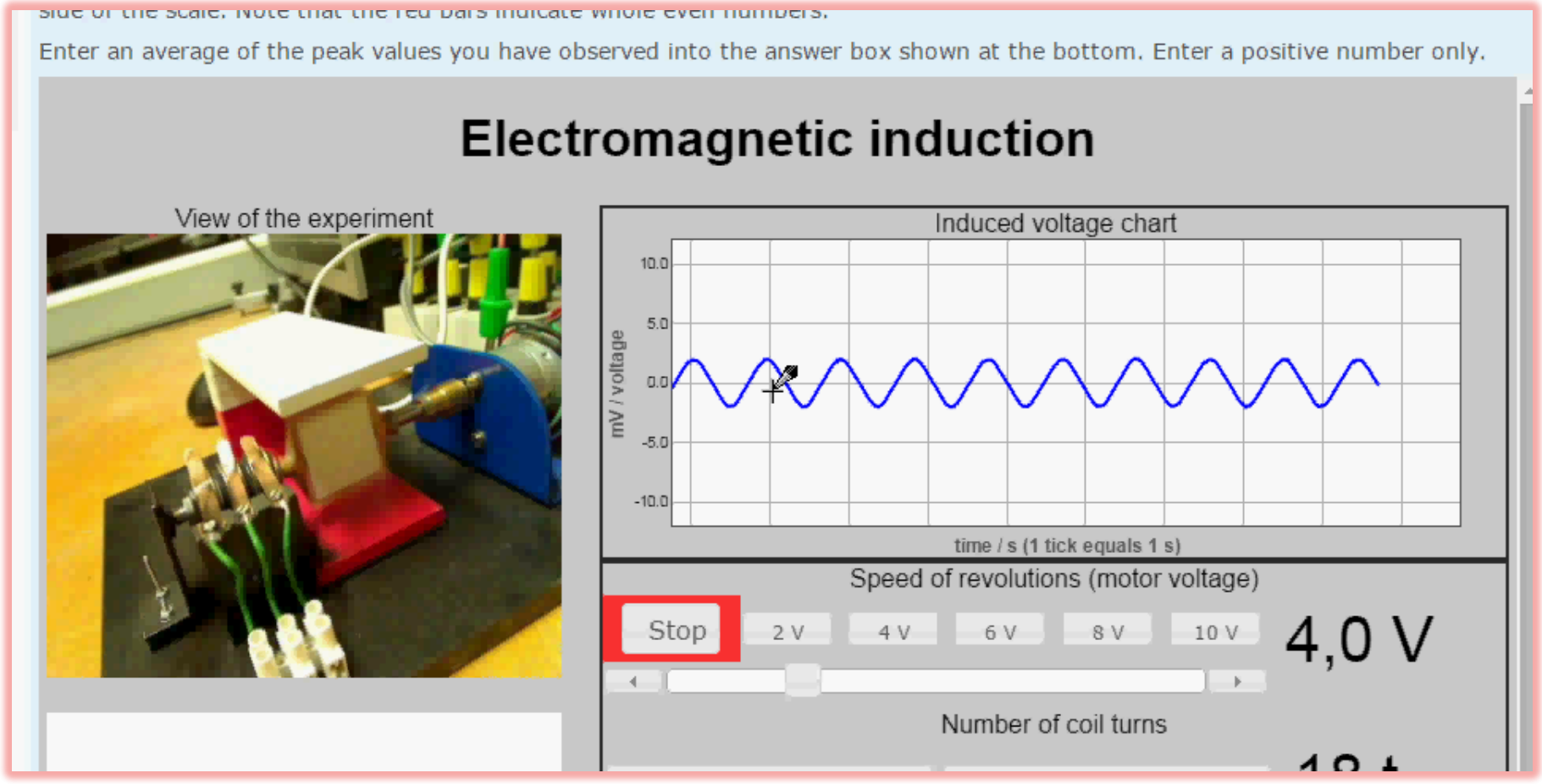




# Remote Labs

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



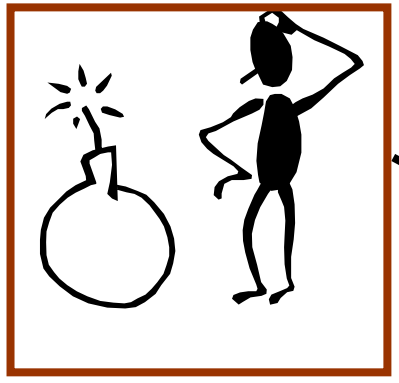
# Fablusi – Role-play software

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

http://www.fablusi.com

# What Happens in a Role Play?

Adopt a role

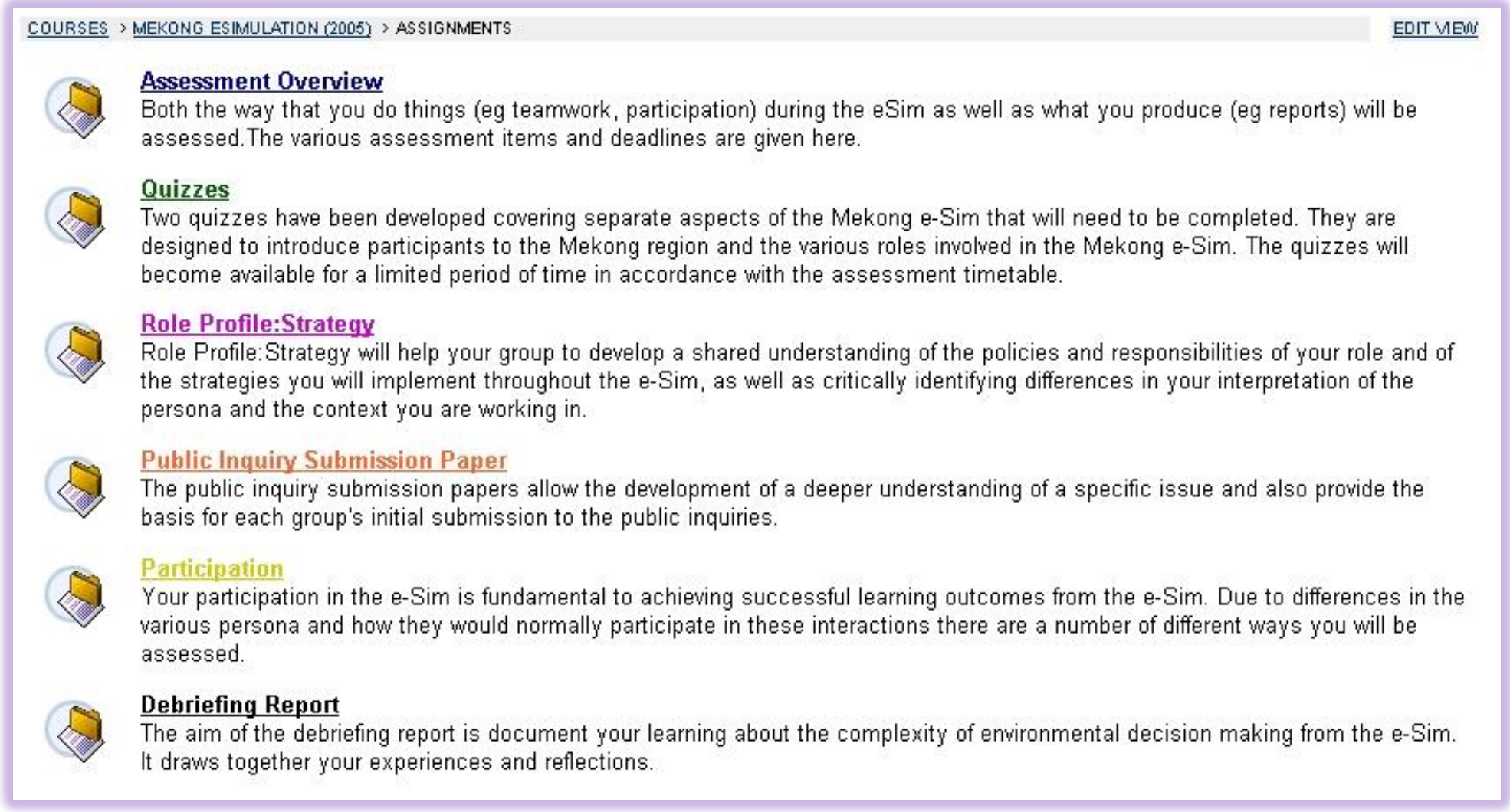


Issues & problems occur

Interaction, debate and consequences

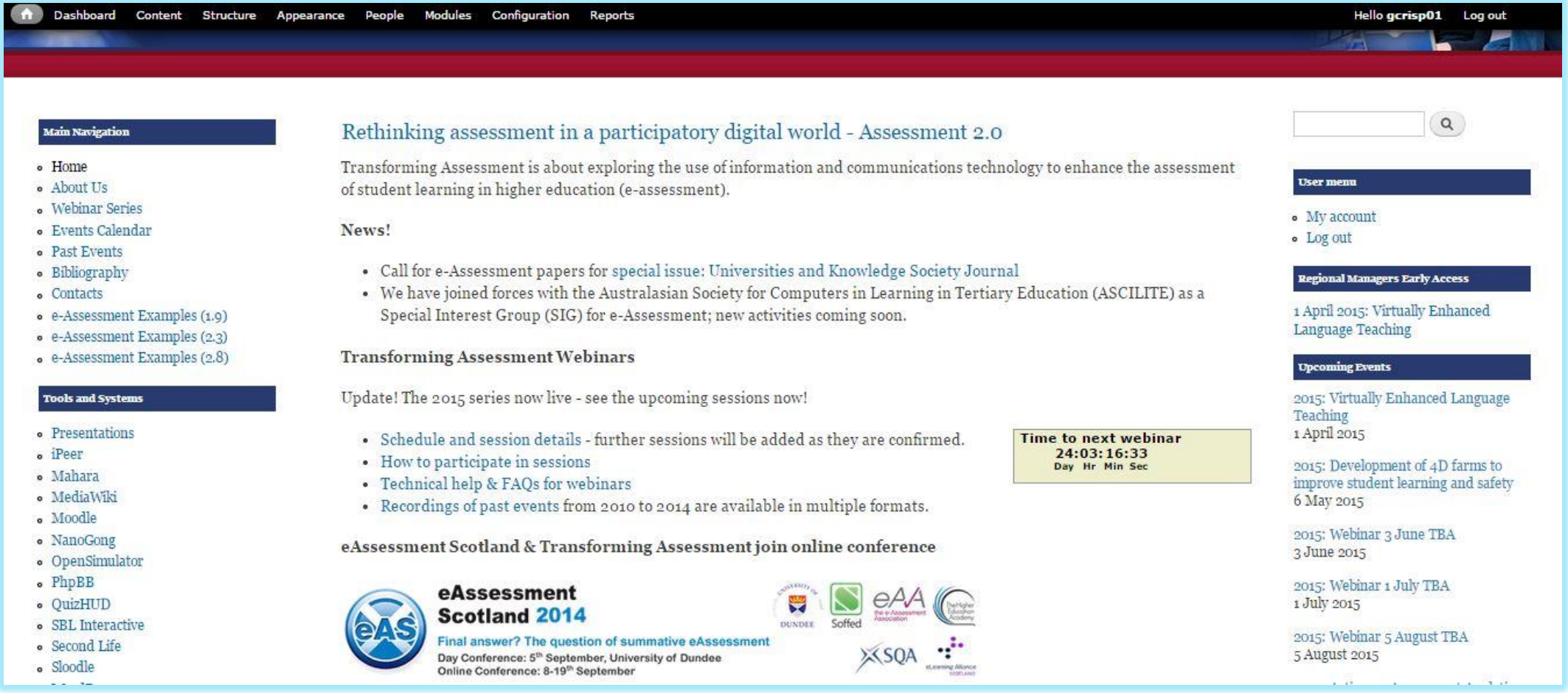
Reflection and conclusions justified

# What Happens in a Role Play?



# Scenario based learning - SBLi

# http://www.transformingassessment.com



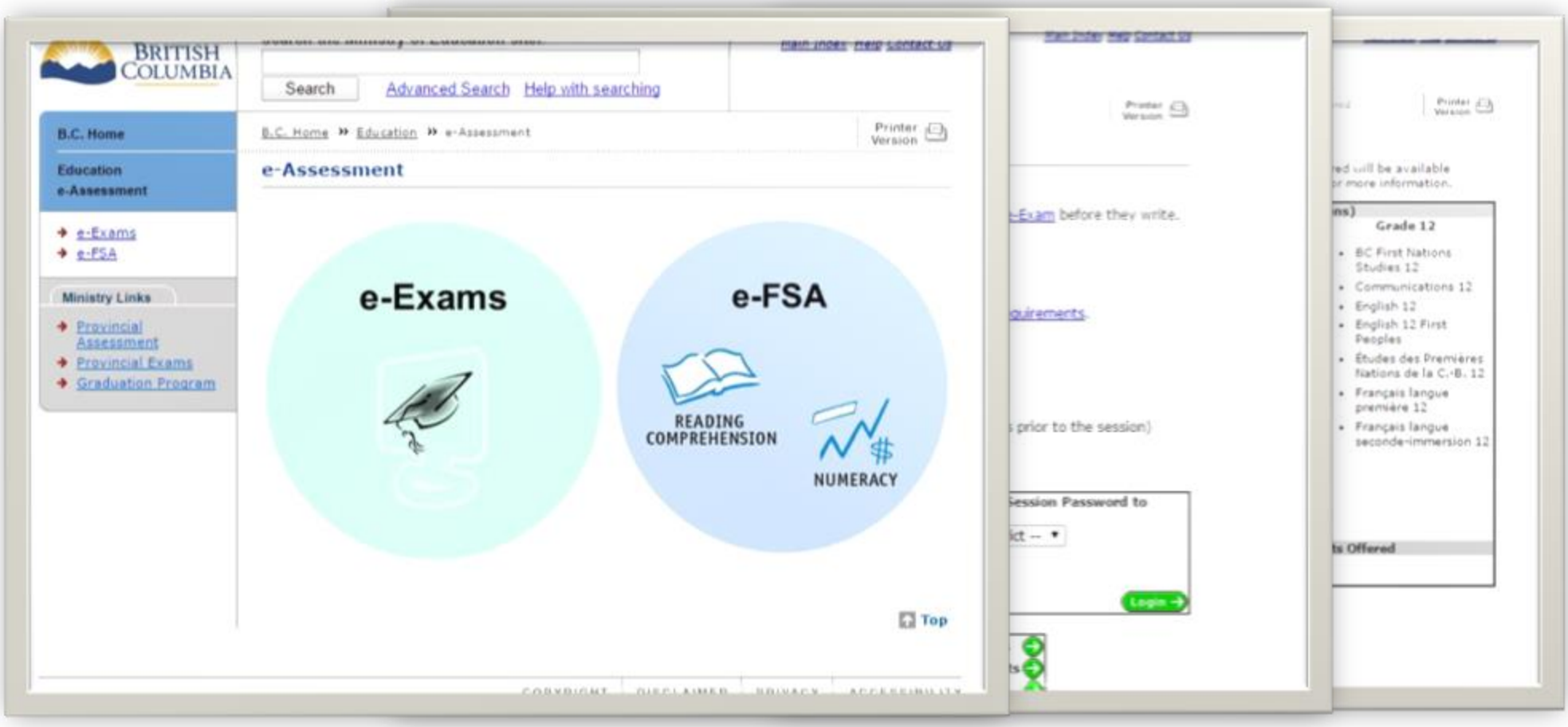
## Assessment responses

**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



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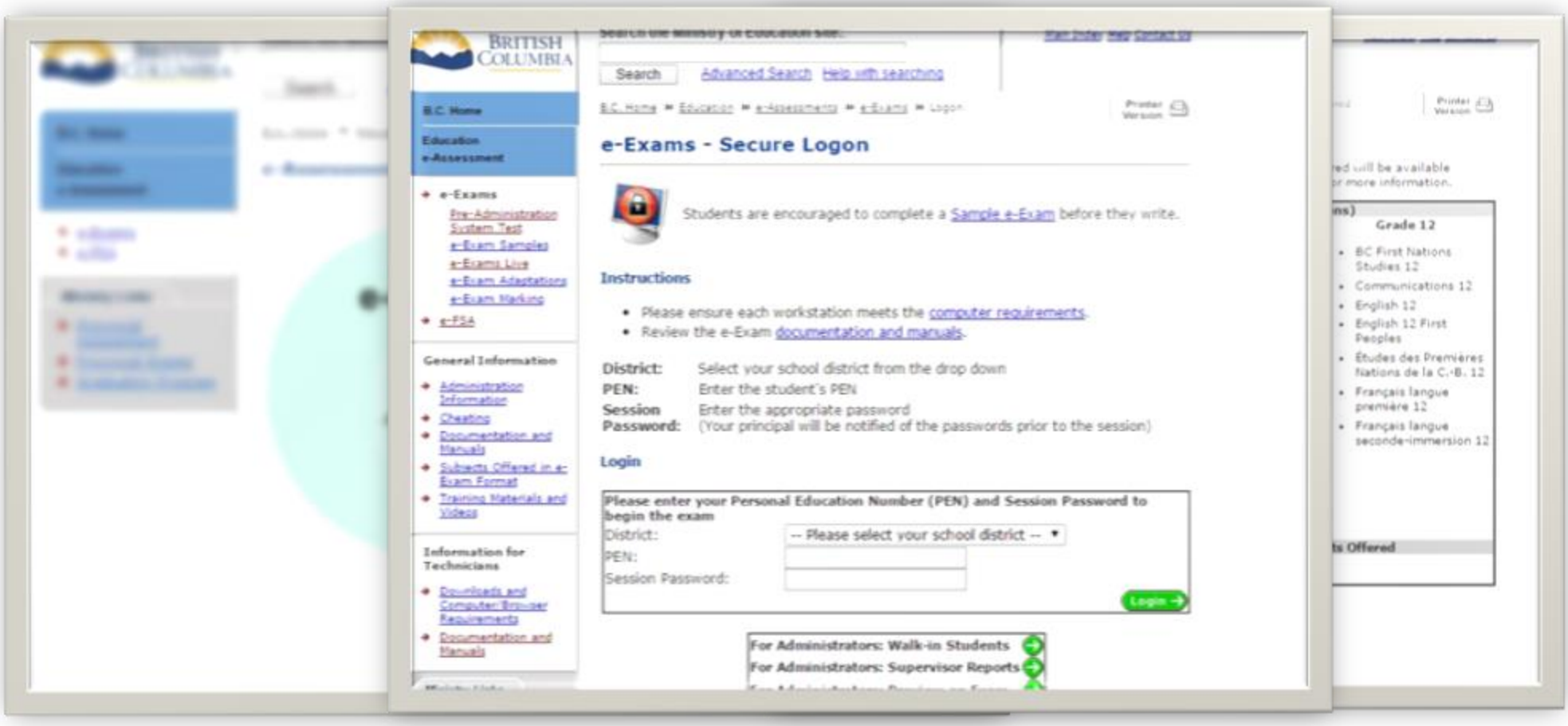

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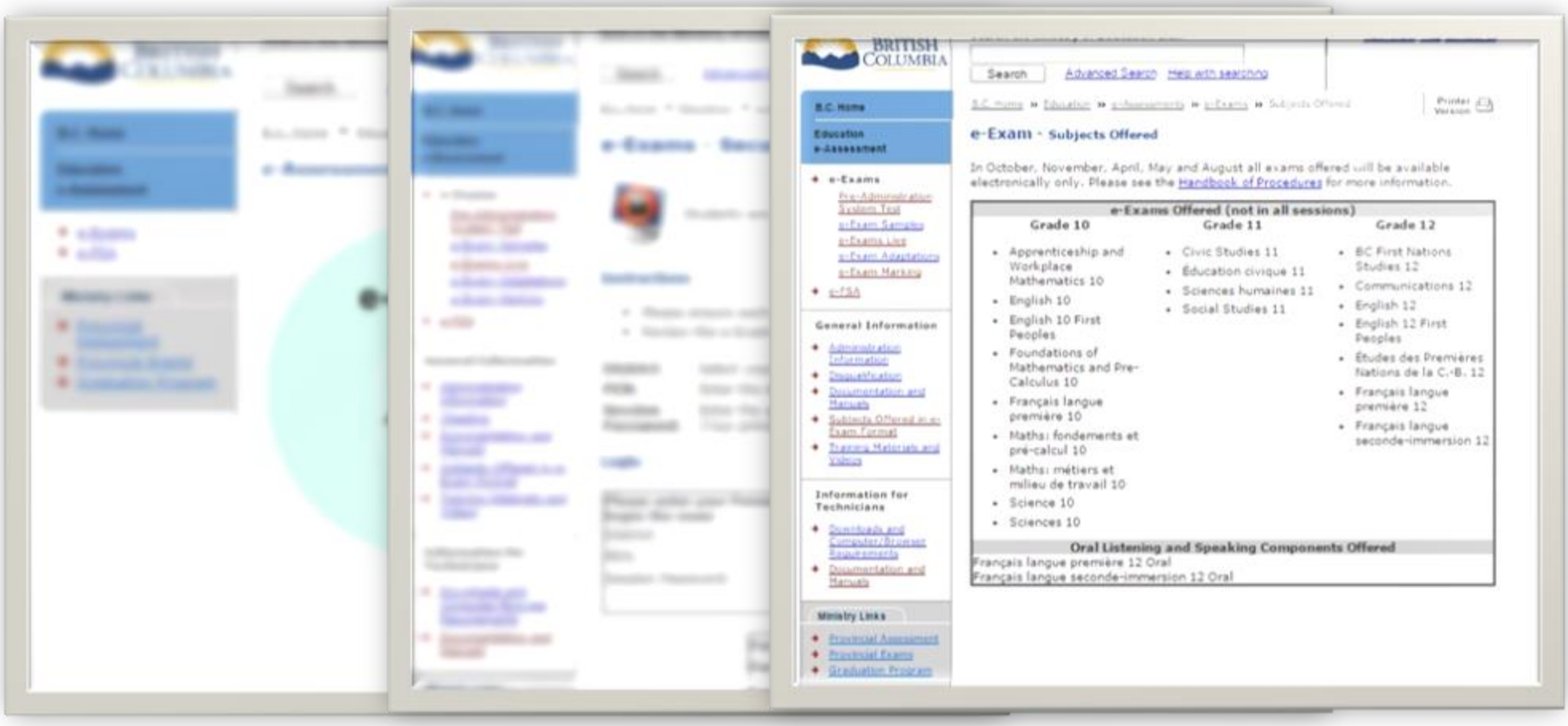
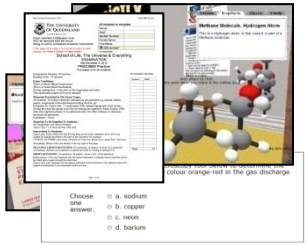


# Dr Mathew Hillier – University of Queensland
# http://www.transformingexams.com

# e-Exam Workflow

## Set-up: prepare exam learning materials



Academic creates exam learning material

Create master USB (tested)

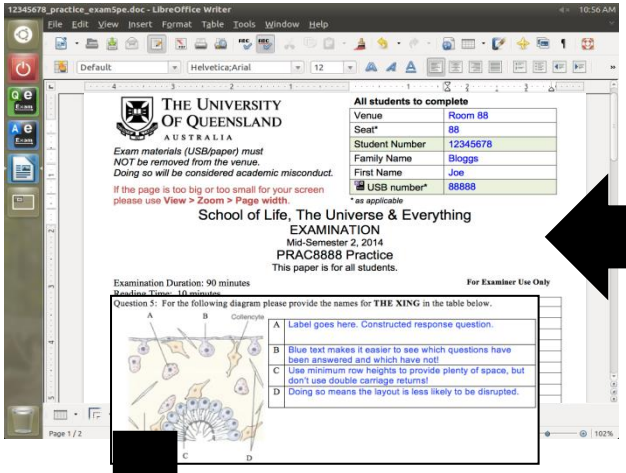
USBs duplicated per student

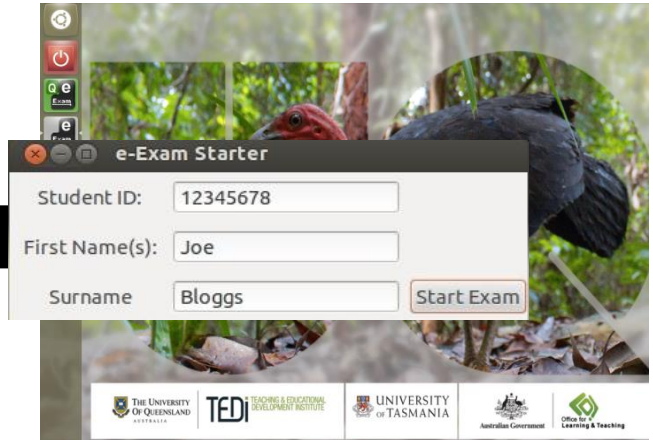
## Pre-session:

Student laptop setup & practice.

## Exam room use

*Ubuntu Live USB. Libre Office, Moodle etc*




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

## Post session: retrieve responses and assessment

Collect USBs (responses)

Responses retrieved from USBs.

Collated e-responses sent to academic.

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:*

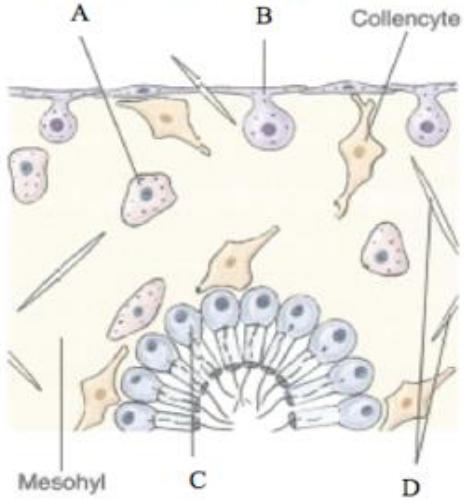
a) Mauris id mi id orci interdum semper.
b) Sed eu neque ut est dignissim fringilla.
c) Vivamus in dolor euismod, luctus libero vel, pulvinar quam.
d) Mauris vehicula eros a viverra pellentesque.
e) Curabitur eu mi at nibh commodo varius non non lorem.
f) Aenean eget orci porta, malesuada lorem sit amet,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

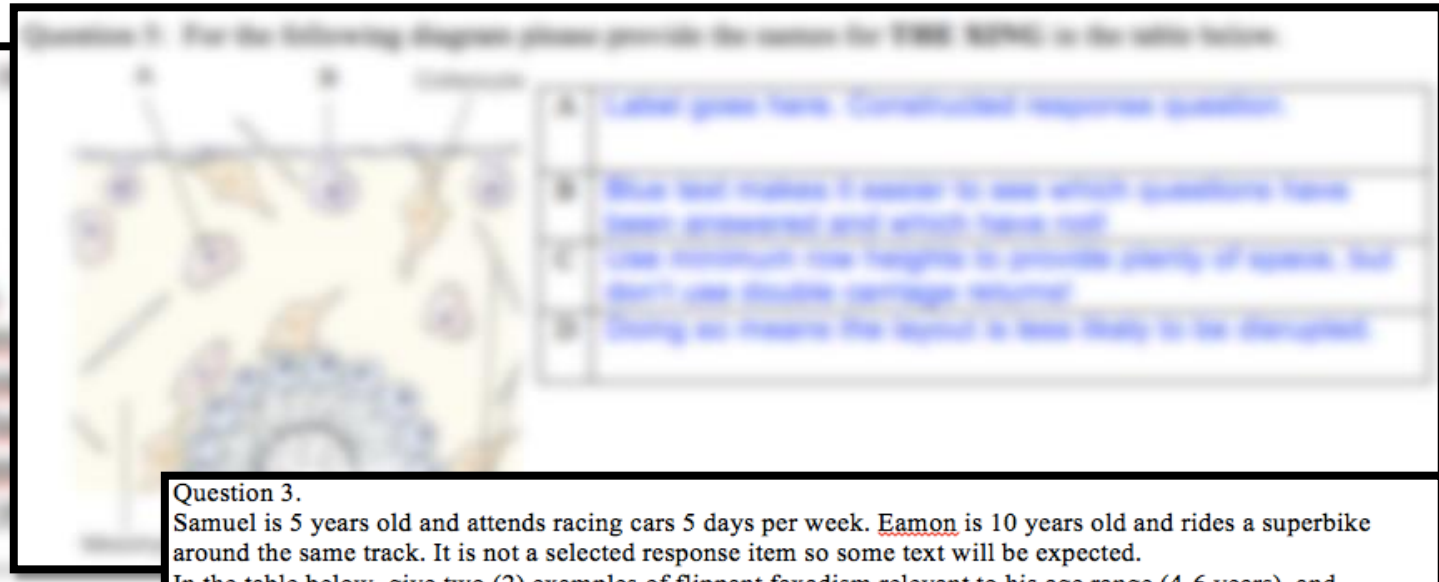
Question types used: short answer/essay, matching, construct a table, label a diagram/image (by filling a table). Manual marking.

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.

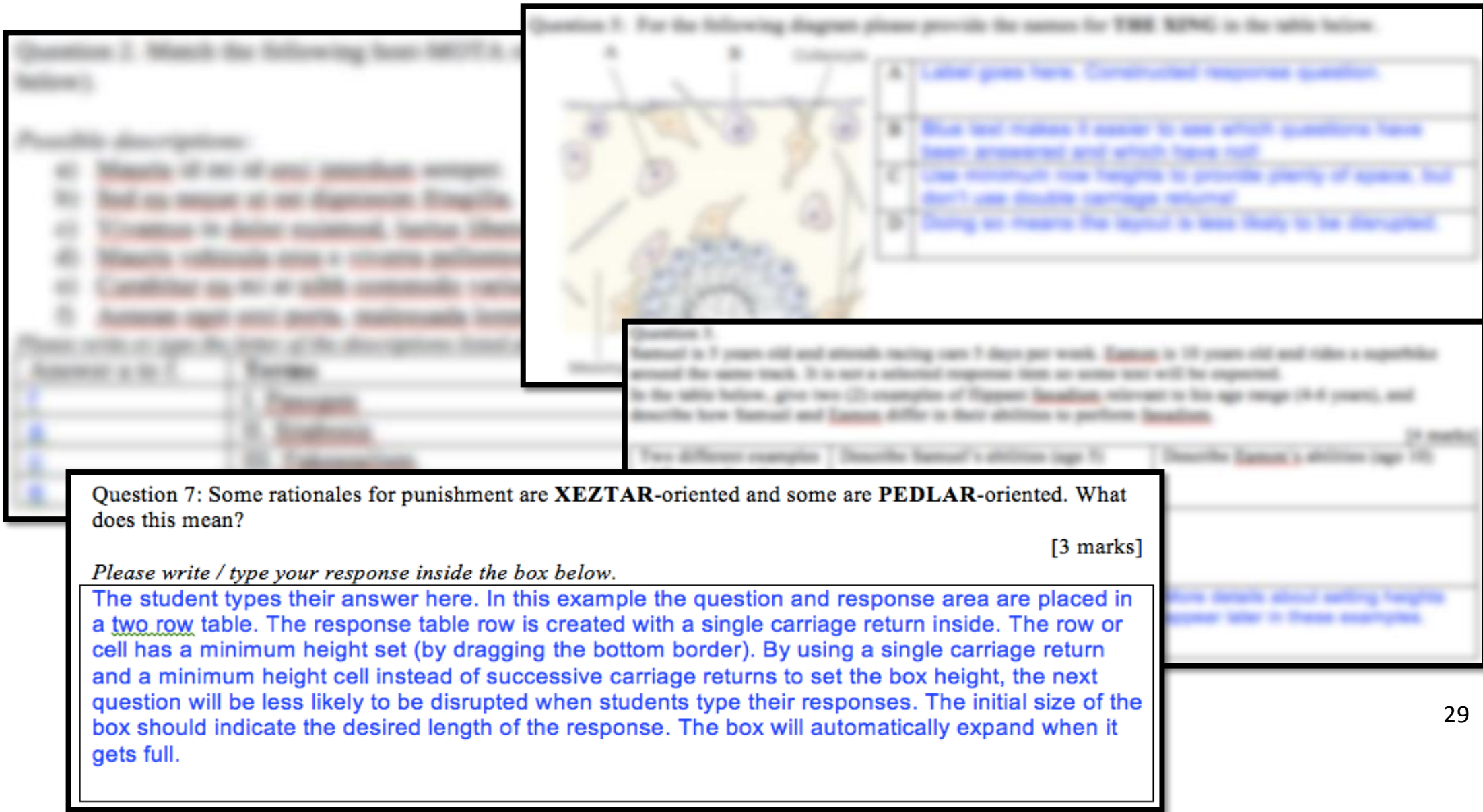


Question 3.
Samuel is 5 years old and attends racing cars 5 days per week. Eamon is 10 years old and rides a superbike around the same track. It is not a selected response item so some text will be expected.
In the table below, give two (2) examples of flippant faxadism relevant to his age range (4-6 years), and describe how Samuel and Eamon differ in their abilities to perform faxadism.

[4 marks]

| Two different examples of flippant faxadism (one per row) | Describe Samuel's abilities (age 5) | Describe Eamon's 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.



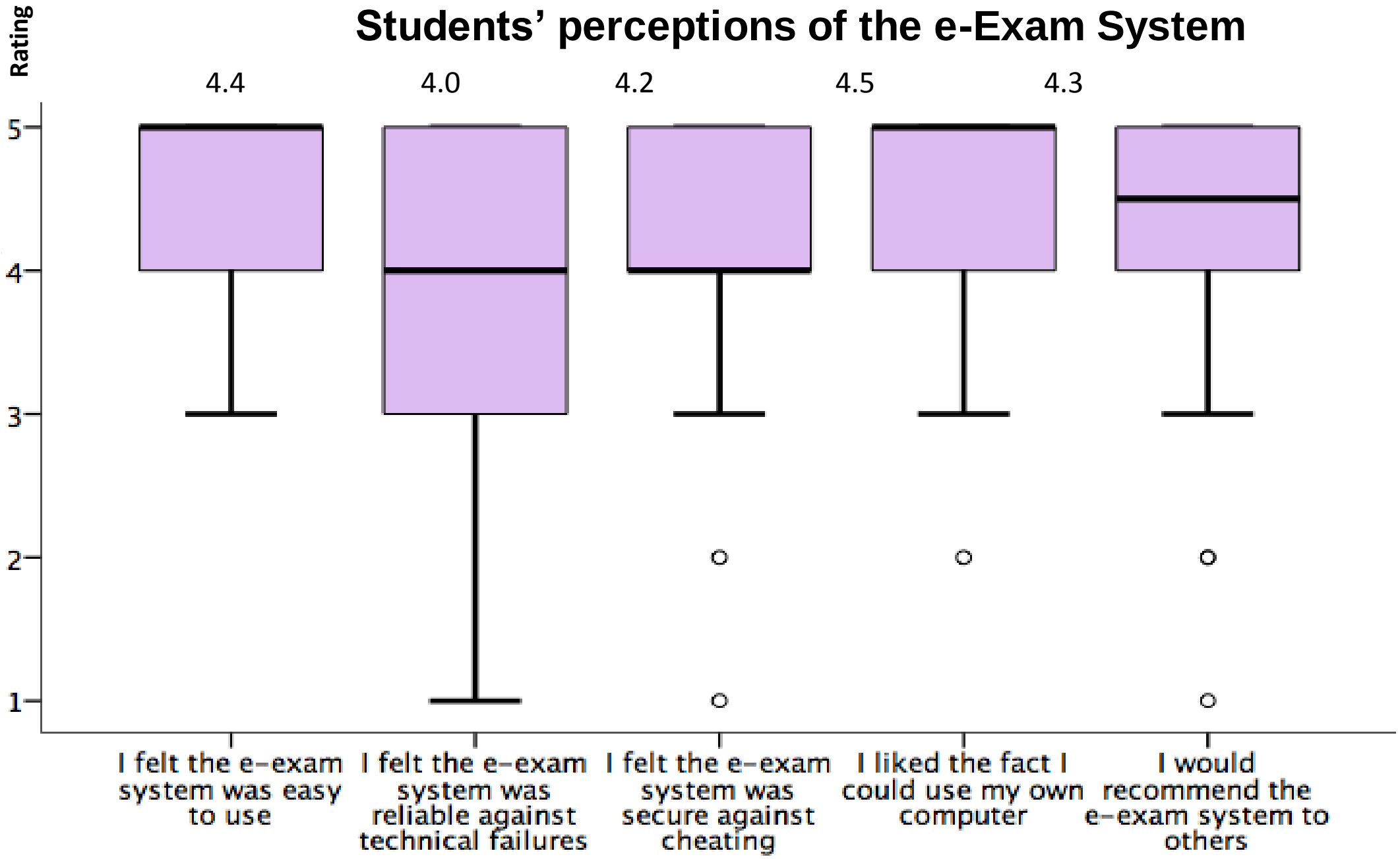
Question 7: Some rationales for punishment are **XEZTAR**-oriented and some are **PEDLAR**-oriented. What does this mean?

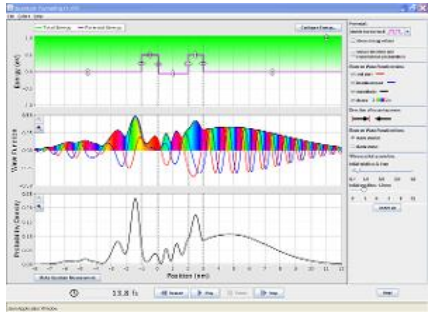
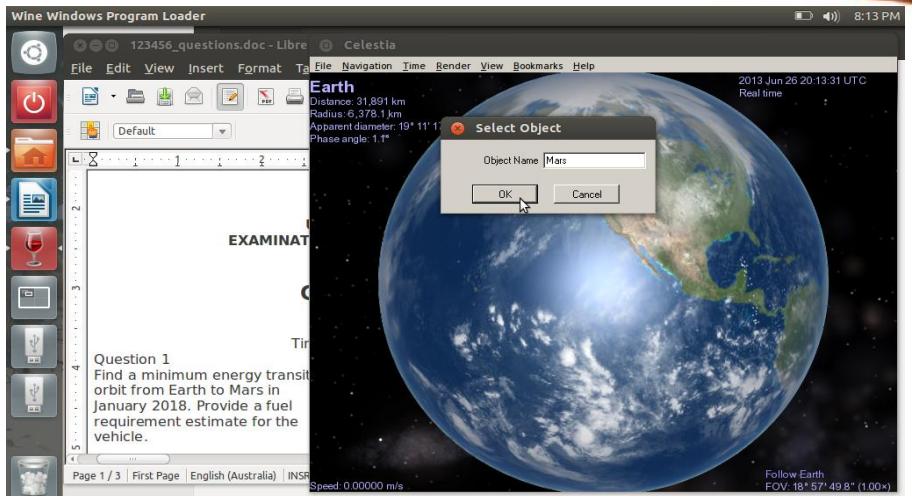
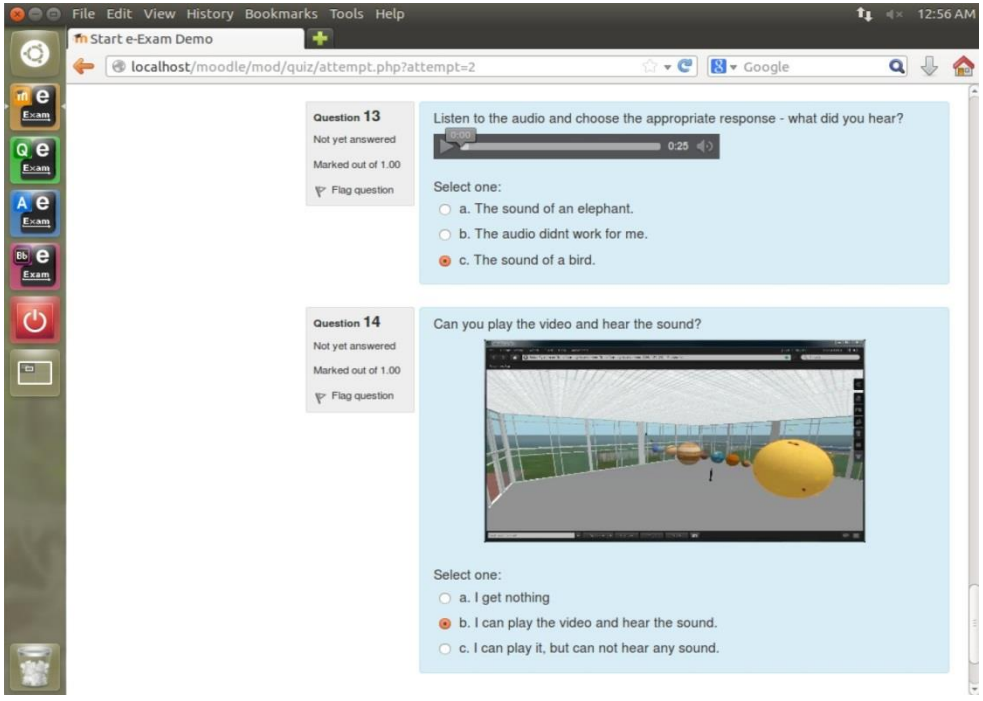
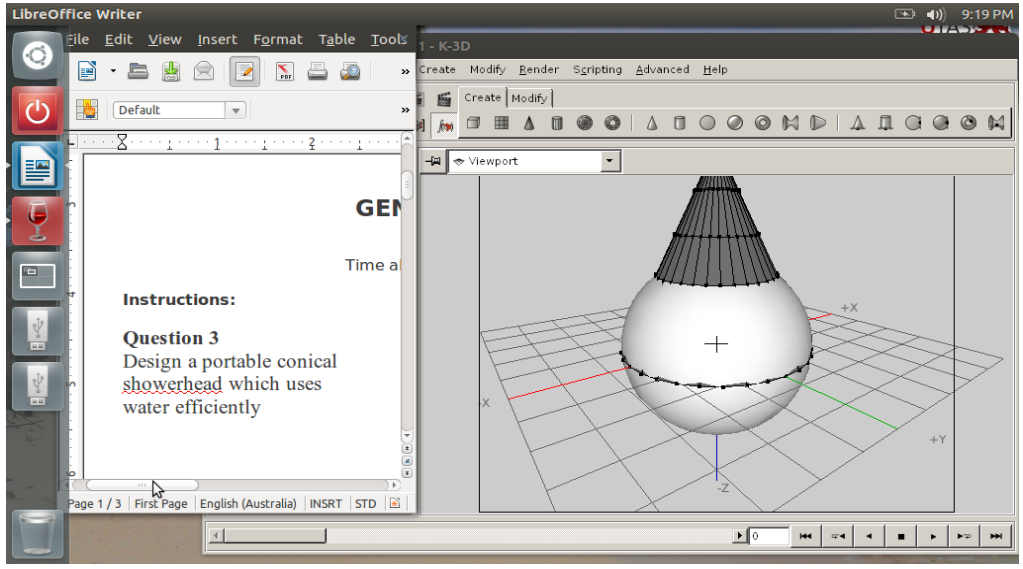
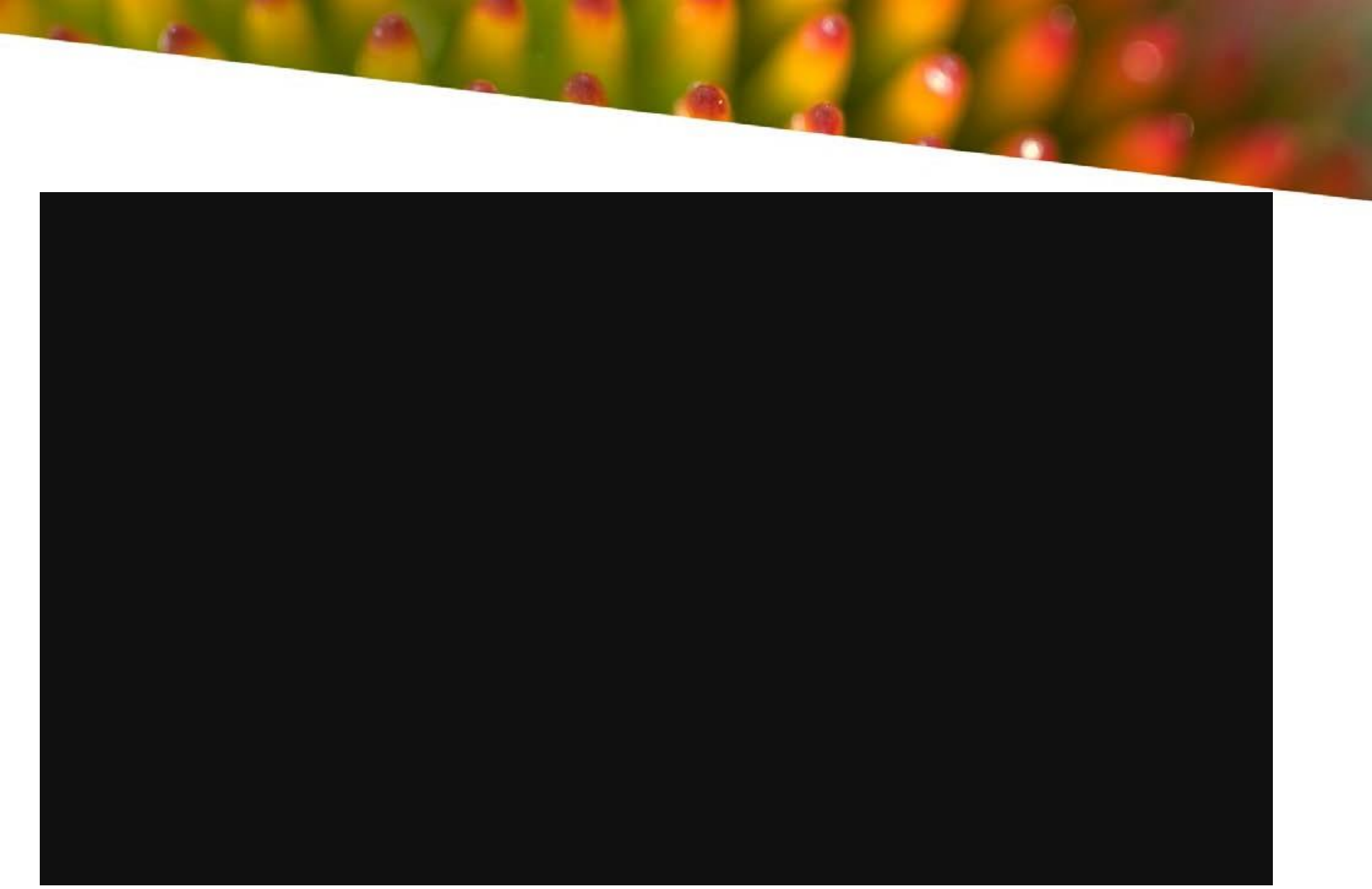
[3 marks]

*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