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Integrating TRIADS CBA into a Biology curriculum

Some lessons learned so far and a look to the future

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The situation

- **adults (aged >20 y), full-time employed**
- **variety of educational backgrounds**
- **reflect the cultural diversity typical of London**
- **classes: evening, once per week**

Goal: Improve Learning Support

- **CBA can play a key role…**
  - forces author to carefully consider key learning objectives
  - formative and summative modes
  - web-delivered
  - sophisticated question styles permit tests of higher-order learning
- **CBA<u>F</u> is even better**
  - <u>F</u> = feedback

TRIADS CBA

- **TRIADS = <u>TRI</u>partite <u>A</u>ssessment and <u>D</u>elivery <u>S</u>ystem**
  - **"…a toolkit for users of Authorware Professional designed to facilitate rapid and easy production of computer aided assessments. The sign-on, question sequencing, results calculation and filing are handled automatically."**

  - **http://www.derby.ac.uk/assess/webdemo/**

TRIADS Authoring & Delivery (1)

- **Code templates for around thirty generic question styles**
  - **Multiple-choice/response types**
  - **Move object types (label diagram, classification, sequence)**
  - **Text/Numeric entry**
  - **Graph plotting**
  - **Draw Object**
  - **Combinations**

TRIADS Authoring & Delivery (2)

- **Authorware packages assessments for either:**
  - **Web/Intranet delivery**
    - **Requires Authorware Web Player Plug-in**
  - **LAN/Local delivery (as an .exe)**
- **Results are filed either locally or back to FTP server**

OLAAF: Rationale

- **OLAAF = OnLine Assessment and Feedback**
  - **HEFCE FDTL4**
- **The gaps:**
  - **few tools available to guide the author in <u>composing</u> appropriate questions and feedback**
  - **few resources to guide the author in <u>combining questions</u> in assessments in a way that enhances student learning**

Objectives of the OLAAF Project

- **Develop and disseminate generic guidelines for the construction of CBAF**
  - **through collaborative efforts of the project consortium and other OLAAF participants**
- **Major output of this collaboration:**
  - **a "CBAF Author's Toolkit"**
    - **resources available via the web, on CD, and in print**
    - **will support authors in the design, delivery and evaluation of CBAF**
    - **guidance will, where possible, be evidence-based**

OLAAF will focus on…

- **Test "higher order learning"**
  - **i.e. cognitive levels *above* recall**
- **ReCAP***
  - **<u>Re</u>call (= Bloom's "knowledge")**
  - **<u>C</u>omprehension**
  - **<u>A</u>pplication**
  - **<u>P</u>roblem solving (= analysis + synthesis + evaluation)**

  * Imrie (1995) *Assessment & Evaluation in Higher Education* 20 (2): 175-189.

OLAAF will focus on…

- **Assessment Construction**
  - **not "question banks", rather…**
  - **how to most effectively combine question styles to promote and test higher learning**
- **High Quality Feedback**
  - **in formative and summative assessment**

OLAAF Consortium

- **Birkbeck College, University of London (Lead Site)**
  - **Biological & Chemical Sciences, Earth Sciences**
- **University of Plymouth**
  - **Biological Sciences, Environmental Sciences**
- **London Metropolitan University**
  - **Biological & Applied Sciences**
- **University of Brighton**
  - **Institute of Nursing & Midwifery**

- **University of Wales College of Medicine**
  - **Dental School**
- **University of Birmingham**
  - **Civil Engineering**

Preparing students for TRIADS

- **Test the subject matter, not "TRIADS skills"**
  1. Provide opportunities for supervised practice
  2. Provide support materials
  3. Author questions carefully and consistently

1. Practice opportunities

- **Year 1, Autumn Term**
  - a "practice" test and a "low stakes" test
  - paper-based "tutorial" given
- **Year 1, Spring Term**
  - frequent TRIADS testing a key feature of *Molecular Cell Biology* unit

2. Support: print & web

- **logging in to TRIADS tests**
- **examples of question styles**
- **test-taking strategies**
- **explanation of results output**
- **obtaining Authorware plug-in**

Logging in...

- **Demo shows this**

Examples of question styles...

- **word document handout**

Test-taking strategies…

- **Clearing incorrect responses**
  - **emphasise click "done", click "no"**
- **How to use swap areas**
- **Cues: colour-coded answer slots and labels**
- **Paging behaviour**
  - **one-by-one; skip and go back**
- **Revisiting questions**
  - *Why are they blank!?*

Results output...

1	DETAILS
2	Question name QDept. Q% secs QWt Acc%
3	Q1 birkbeck biology 40 87 1 4
4	Question
5	In the illustration of an amino acids shown below, the key atoms/groups are depicted in different colours. Identify each highlighted group by moving the correct label to the appropriate answer slot.
6	Correct answer(s)
7	'side chain'
8	'amino group'
9	'carboxyl group'
10	'alpha carbon'
11	
12	Answer(s) given
13	You labelled:
14	'side chain' as 'carboxyl group'
15	'amino group' as 'amino group'
16	'carboxyl group' as 'carbohydrate'
17	'alpha carbon' as 'alpha carbon'

3. Consistent authoring

- **Careful commands with consistent usage between questions**
  - refer to *labels* and *answer slots*
  - *Sequence: "…place labels in order to describe the sequence of events in…"*
  - *Label diagram: "…use the labels to identify…"*
- **Logical coding**
  - e.g. layout, colour/texture coding

Place in curriculum? (present)

- **Year 1:**
  - **2 of 3 course units**
    - *Foundations of Biology*
    - *Molecular Cell Biology*
- **Year 2:**
  - **Summer vacation unit**
    - *Field Biology*
  - **1 of 4 units**
    - *Cellular Metabolism*

Place in curriculum? (future)

- **Year 3/4:**
  - *Statistics for Biologists*
  - *Animal Physiology & the Environment*
  - *Other?*
- **MSc Physiology**
  - *Physiology of Respiratory and Circulatory Systems*

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