School of Biological and Chemical Sciences,
Birkbeck College, University of London, WC1E 7HX, UK

Integrating TRIADS CBA into a Biology curriculum

Some lessons learned so far and a look to the future

Richard C. Rayne and Glenn K. Baggott
r.rayne@bbk.ac.uk
http://www.bbk.ac.uk/olaaf/

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

2

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
- CBAF is even better
  - F = feedback

3

TRIADS CBA

- TRIADS = TRIpartite Assessment and Delivery System
  - "…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/

4

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

5

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

6

OLAAF: Rationale

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

7

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

8

OLAAF will focus on…

- Test "higher order learning"
  - i.e. cognitive levels *above* recall
- ReCAP*
  - Recall (= Bloom's "knowledge")
  - Comprehension
  - Application
  - Problem solving (= analysis + synthesis + evaluation)

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

9

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

10

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

11

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

12

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

13

2. Support: print & web

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

14

Logging in…

- Demo shows this

15

Examples of question styles…

- word document handout

16

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!?***

17

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'

18

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**

19

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*

20

Place in curriculum? (future)

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

21

Acknowledgements

- Birkbeck College Development Fund
- The TRIADS team
- Dijana Maric
  - (Authorware Programming, TRIADS admin)

22