



Student perceptions of computer-based formative assessments in a semi-distance module

Glenn K. Baggott and Richard C. Rayne
School of Biological and Chemical Sciences
Birkbeck College, University of London, WC1E 7HX, UK
r.rayne@bbk.ac.uk
g.baggott@bbk.ac.uk




Presented at the 8th International Computer Assisted Assessment Conference in Loughborough, UK, July 6 & 7, 2004. See: <http://www.caaconference.com/>




Field Biology (year 2, BSc)

- **Semi-distance learning**
 - 5 weeks: lecture block at Birkbeck (evenings)
 - 5 weeks: self-directed learning
 - 1 week: residential field course
 - 4 weeks later...computer-based exam at Birkbeck
- **Staged formative CBAF ('e-tutorials') support student learning**
 - one CD given at start of module (Group 1 tutorials)
 - second CD given at field course (Group 2 tutorials)
- **Assessed work (summative)**
 - four pieces of written work (field reports; 80%)
 - end of module computer-based exam (20%)




CBAF Construction

- **Map items to learning outcomes**
 - use CBAF where appropriate
 - staged CBAF delivery is key: meet needs of students when they are ready to benefit
- **Principled feedback design**
 - reduce 'pre-search availability'
- **Appropriate item mix...**
 - ...with respect to cognitive levels
 - ...taking account of needs of the student at the time the CBAF is presented



Assessed work mapped to learning outcomes

Assessment tasks	Mode	Learning Outcomes					
		1	2	3	4	5	6
<i>Pre-trip lecture course</i>	<i>Formative</i>	x	x		x		
<i>CBA Tutorials 1</i>	<i>Formative</i>	x					x
<i>CBA Tutorials 2</i>	<i>Formative</i>		x				x
<i>Field Investigation 1</i>	<i>F/S</i>		x	x			x
<i>Field Investigation 2</i>	<i>F/S</i>		x	x			x
<i>Field Investigation 3</i>	<i>F/S</i>		x	x			x
<i>Mini project</i>	<i>F/S</i>					x	x
<i>End of unit CBA exam 16 questions</i>	<i>Summative</i>	x	x				x




Feedback design

Tutorial CBAF were designed to ensure that students had to 'work at' them...

Feedback styles:

1. **diagnosis of response with no solution given**
(return to tutorial material)
2. **diagnosis of response with partial solution given**
(partial tutorial material presented at completion of question)
3. **diagnosis of response with complete solution given**



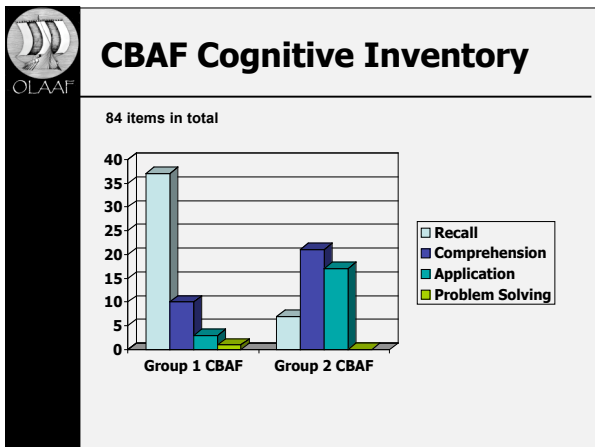
Criteria for classifying items by cognitive type (ReCAP)

Recall
Answers are information previously encountered in course materials. Text or images exactly as in source; stem may be same also.

Comprehension
Form of answers, text or images, will not have been seen in the course materials. Selection of the correct answers depends on an understanding of the question and use of the concepts to deduce the correct selection.

Application
Student must apply the concepts appropriate to the question posed. Answers, text or images, will not have been seen in the course materials. Differs from comprehension in that the student is expected to use understanding to produce a defined outcome.

Problem solving (Analysis/Synthesis)
Analysis: must process the question into its component parts.
Synthesis: must bring together (synthesise) an outcome from novel (unseen) and non-novel (seen) sources to determine the correct outcome.

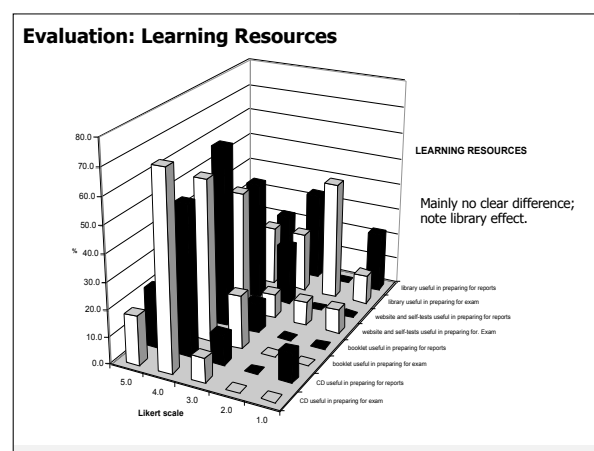


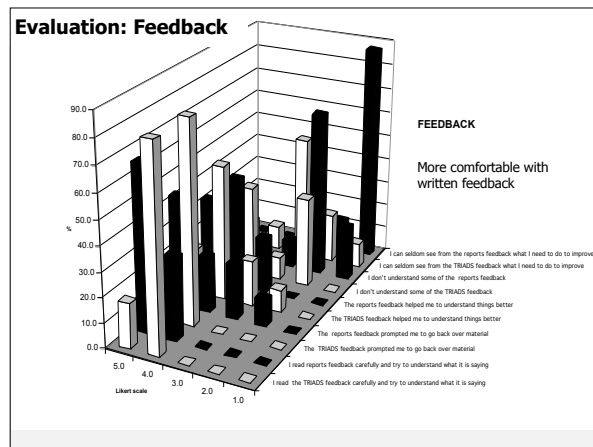
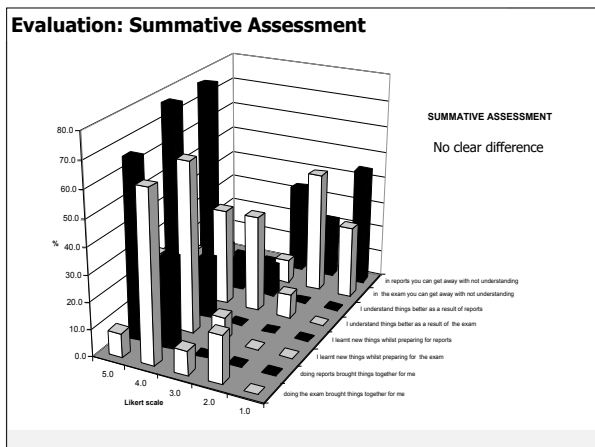

-
- ### Tutorial CBAF on CD
- **Group 1 tutorials: provided in pre-field trip week of lectures and practicals**
 - to support learning of ecology content and practise essential skills
 - tutorial mode with diagnostic feedback *and*
 - self-test mode— some web-delivered—return only score, no feedback
 - mainly recall and some comprehension to establish students' understanding
 - **Group 2 tutorials: provided for the field-trip week; to support the fieldwork and report writing**
 - built on the knowledge acquired in pre-field trip lectures and Group 1 tutorials
 - tested mainly comprehension and application of concepts and skills

-
- ### Feedback on summative work
- **Two summative elements**
 - computer-based exam: answers revealed plus grade
 - written reports: returned with annotation and written feedback sheet and guide
 - **Summative assessment outcomes**
 - 2002: mean 56.6% (range 16.8 to 81.8)
 - 2003: mean 64% (range 51.8 to 71.8)
 - Fewer low achievers?

-
- ### Evaluation Strategy
- **Focus on “assessment experience”**
 - evaluate all assessments (CBA or other) similarly, to disguise ‘novelty effect’
 - use, wherever possible, common, neutral questions about assessments
 - **Timing of questionnaire administration**
 - 1 week after release of first CD
 - after computer-based exam
 - after all summative results had been given


-
- ### Evaluation Questions
- **Did the assessment promote learning? (4 items)**
 - doing the exam/reports brought things together for me
 - I learnt new things whilst preparing for the exam/reports
 - I understand things better as a result of the exam/reports
 - in exam/reports you can get away with not understanding
 - **Nature, quality utility of feedback (5 items)**
 - I read the TRIADS/reports feedback carefully and try to understand what it is saying
 - The TRIADS/reports feedback prompted me to go back over material
 - The TRIADS/reports feedback helped me to understand things better
 - I don't understand some of the TRIADS/reports feedback
 - I can seldom see from the TRIADS/reports feedback what I need to do to improve
 - **Utility of all learning resources (6 items)**
 - CD useful in preparing for the exam/reports
 - booklet useful in preparing for the exam/reports
 - website and self-tests useful in preparing for the exam/reports
 - library useful in preparing for the exam/reports
 - [availability] electronic tutorials/self-tests on CD useful to me...for the exam/reports
 - [availability] electronic tutorials/self-tests on web useful to me...for the exam/reports




Outcome of evaluation

- Student opinion in **two** clear camps
 - *Formative assessment helped develop understanding by...*
 - providing opportunities for practice
 - reinforcing key concepts
 - structuring student study/learning
 - prompting further learning
 - *Formative assessment was exclusively useful for passing CBA exam by...*
 - providing practice questions
 - providing correct answers for memorization
 - helping predict content of the computer-based exam




Good news...

- No evidence in responses or free comments of 'novelty effect'
- Questionnaires thus surveyed 'assessment experience'
 - ...not "do you like having CDs..."
- Need to evaluate student motives; examine if tactics can shift behaviour productively



Contact

- Dr Glenn Baggott
 - Lecturer in Biology
 - School of Biological & Chemical Sciences
 - Birkbeck College
 - University of London
 - Malet Street
 - London WC1E 7HX, United Kingdom
 - +44 (0)20 7631-6253
 - g.baggott@bbk.ac.uk
- OLAAF web site:
 - <http://www.bbk.ac.uk/olaaf/>



Acknowledgements

- Funding:
 - Birkbeck College Development Fund
 - Higher Education Funding Council of England (HEFCE) through FDTL4
- People at Birkbeck:
 - Authorware Programmers: Dijana Maric, Ellen McCarthy, Caroline Pellet-Many
- People elsewhere:
 - Don Mackenzie and his team at the Centre for Interactive Assessment Development, University of Derby