



Creating a national online resource for enhancing assessment practices in the biological sciences

Charlotte Taylor and **Mary Peat**, School of Biological Sciences, The University of Sydney, Australia

Dawn Gleeson, Department of Genetics, The University of Melbourne, Australia

Kerri-Lee Krause¹, **Kerri-Lee Harris** and **Robin Garnett**, Centre for the Study of Higher Education, The University of Melbourne, Australia
(¹now Griffith University)

cetaylor@bio.usyd.edu.au mary.peat@bio.usyd.edu.au d.gleeson@unimelb.edu.au
k.krause@griffith.edu.au k.harris@unimelb.edu.au robinjg@unimelb.edu.au

Introduction

This project was one of several discipline-specific assessment projects funded by the Carrick Institute for Learning and Teaching in Higher Education during 2006-7. Entitled *Enhancing Assessment in the Biological Sciences*, the project took a collaborative approach to developing and disseminating resources to support the enhancement of student assessment in the biological sciences. University staff and students from across Australia were involved in consultations, and many staff also provided detailed written examples of their own assessment practice for inclusion in the web-based resource.

The *bioassess* web site, the principal outcome from the project, complements the 2002 AUTC-funded resource *Assessing Learning in Australian Universities*. The *Assessing Learning* web site was developed by the Centre for the Study of Higher Education (CSHE) at The University of Melbourne. The *Assessing Learning* site provides the context for the Carrick assessment projects, and remains an extensively used resource. The *bioassess* web site complements the *Assessing Learning* site by providing extensive coverage of a range of assessment strategies and issues. The current project was developed in response to the recognised need for additional resources which highlight approaches to assessment that align with discipline-specific learning outcomes, and to address the issues most relevant to the disciplinary community.

The *bioassess* project team involved a three-way collaboration, with the CSHE as the lead agency, in partnership with recognised leaders in teaching and learning in the biological sciences from The University of Melbourne and The University of Sydney. The project team was supported by an Advisory Group (see Appendix) and by Professor Dai Hounsell, Professor of Higher Education, University of Edinburgh, who provided expert advice from an international perspective.

A broad definition of the biological sciences was used in this project, encompassing all life sciences. The emphasis was upon undergraduate teaching and learning, although many of the findings could translate to masters by coursework programmes.

While the development of web-based resources was an important aspect of the project, an equally important feature was a carefully planned dissemination strategy. This involved engaging the disciplinary community in an ongoing discussion about assessment practices, a strategy interwoven with every stage of the resource development.



A staged, consultative approach

The project team attached the highest priority to collaborating with representatives of the discipline across the higher education sector, with a view to developing resources which reflect contemporary issues and trends and which are responsive to the diverse needs of staff and students across a range of institutional types and contexts. A staged approach was taken, providing three principal opportunities for input from across the disciplinary community:

1. Interviews in a range of institutions

In the first stage of the project the team interviewed 57 staff and 47 students and recent graduates from the biological sciences. Eight institutions were involved in the interviews: Charles Sturt University; Curtin University; Deakin University; Flinders University; Queensland University of Technology; The University of Melbourne; The University of Queensland; and The University of Sydney. Consideration was given to the diversity of institutional type, location and programme type, in selecting universities for involvement in this first round of consultation.

Teaching staff were asked to describe their experiences of effective assessment, the learning most valued, issues confronting the discipline regarding student assessment, and approaches taken to address these issues.

Following preliminary analysis of the interview data, the project team prepared a draft web site 'architecture'. The categories were not predetermined – rather, they emerged from the interviews, project team meetings, and input from the project advisors. A clear need for discussion of particular assessment types emerged, as did a number of key issues influencing assessment practice. The importance of curriculum-level decisions regarding assessment was agreed, to the extent that the team decided this warranted specific and thorough treatment in the final resource.

2. Selecting examples of assessment practices

As a result of interviewing staff at eight universities the project team identified a wide diversity of assessment practices in the biological sciences. Initially the team invited selected interviewees to submit examples of these practices and this formed the basis of the examples as seen on the web site. A template was provided for submission of examples and this required details of the design and evidence of reflection of teaching practice.

Extensive review of the interview transcripts allowed the team to solicit further examples relating to the sections of the web site associated with different assessment types. Again the template was provided for submission. Additional examples were also invited as a result of the discussions at the state-based roundtables and the national seminars.

3. State-based roundtables

The second stage of consultation and development included five state-based meetings of interested academics. These 'roundtable' discussions involved 55 academics from 20 institutions and took place in Sydney, Brisbane, Melbourne, Adelaide and Hobart. The draft web site architecture was discussed, as were a range of specific topics including: practical skills assessment; the design and composition of summative examinations for large (first year) classes; peer assessment; groupwork assessment; online assessment; authentic assessment; assessing generic skills; and training for sessional staff. The feedback and input from the roundtables was used in the subsequent development of the web site structure and content.

4. National seminars

The third aspect of consultation involved full-day seminars in Melbourne and Perth. Professor Dai

Hounsell provided the keynote presentation at each. In total, 130 participants from 24 universities took part. The feedback indicated that participants appreciated the chance to meet and discuss assessment with other academics in the biological sciences, with many requests for such seminars be held on an annual basis.

The conceptual structure, or ‘architecture’, of the web site was presented at the seminars, and selected topics were discussed in small groups. These discussions were recorded and so provided additional input into the subsequent development of the web site.

Developing the web site content

In developing and writing the ‘content’ pages, the project team gave priority to: ensuring that the disciplinary-context was featured throughout; emphasising the central role of feedback when discussing each assessment type; presenting strategies for addressing the issues identified; including generic skills and authentic assessment as aspects of all assessment types; and the importance of aligning assessment with intended learning outcomes – and how this might be achieved.

The resulting web site is available at <http://www.bioassess.edu.au/>.

Ideas, issues and examples of innovative and effective assessment practice are presented on the *bioassess* web site under six sections:

- *Learning outcomes in the biological sciences* – what academics and students believe biological science students should know and be able to do by the time they graduate;
- *Principles of assessment* – the multiple purposes of assessment and an explanation of terms commonly used that relate to assessment;
- *Assessment types* – eleven different kinds of assessment frequently used in the discipline, illustrated with examples of current assessment practice;
- *Key issues* – seven topics that particularly concern academics who teach in the biological sciences, illustrated with examples of current assessment practice;
- *Curriculum matters* – resources for academics responsible for designing curricula and that form the bases for good learning, teaching and assessment practice; and,
- *Examples of practice* – specific examples of assessment practice, arranged alphabetically by author. The authors have generously given their permission for these examples to be shared on the web site.

Table 1. Diversity of approaches to assessment in the biological sciences

Assessment Type	Number of Examples
Examinations	18
Group Work	20
Online Assessment	24
Peer and Self Assessment	30
Portfolios and Reflective Journals	3
Practical Assessment	29
Presentations	19
Research Projects	16
Student Participation and Contributions	5
Tests and Quizzes	18
Written Assignments	40



A central feature of the web site is the incorporation of specific examples of effective assessment practice, written and supplied by university educators in the biological sciences. The project team elicited these examples during the various consultations, and contributions were gathered from across the sector. In total, 79 written examples were incorporated. These cover a diverse array of teaching contexts and approaches to assessment as shown in Table 1. On the web site they are linked, as appropriate, to the relevant sections and are available as PDF files.

Some of the project's findings

Assessment in the biological sciences is characterised by diversity. Research projects and presentations that reflect disciplinary practice are common. Some assessment types are more generally familiar, such as tests and written assignments, yet even here the particular learning priorities of the discipline are evident. Collaboration and student involvement is common, with peer and self assessment, and groupwork a feature of many courses.

The 'key issues' identified are by no means confined to teaching and learning in the biological sciences. The ideas and strategies for addressing these also translate to many other disciplines at both undergraduate and postgraduate level. Many of the strategies and initiatives described were designed to address increasing class size in the context of resource constraints. The need to coordinate teaching teams, particularly when sessional staff are involved, was emphasised, and the importance of explicit assessment criteria was emphasised in this regard. A high priority was given to the efficient provision of meaningful and timely feedback.

Making assessment criteria explicit is being used as an important tool for both staff and students. Clearly students benefit when expectations are clarified. Of equal importance, however, is the 'flow on' effect to curriculum planning and review. In making both criteria and standards more explicit, staff are identifying areas for improvement in the design of teaching and learning tasks, including assessment tasks.

Further dissemination, contributions and publications

Hosted by the Carrick Institute through education.au, the *bioassess* site was officially launched in June 2007. There has been substantial positive feedback via the Carrick Institute about the site with comments on the layout, the ease of use and the examples.

By design, the project has involved dissemination throughout. The interviews, roundtables and seminars were all opportunities for people to describe, discuss and share ideas around effective assessment practice. The *bioassess* site provides a means by which university staff can continue to access these ideas and resources. The project team is continuing to promote the *bioassess* site and is encouraging university colleagues across the sector to do likewise.

In addition, staff are encouraged to contribute additional written examples of effective assessment practice. Through an arrangement with UniServe Science, additional examples may be submitted and will be made available from the UniServe Science site, linked from the *bioassess* site.

What is there still to do? From the wealth of data collected, members of the project team plan to develop papers on a range of topics, including the use of online assessment, and the learning outcomes most valued in the discipline.



Acknowledgements

The project team thank the Carrick Institute for Learning and Teaching in Higher Education for funding this project. In addition they would like to thank the staff and students around Australia who gave of their time and provided valuable input into the development of the online resource. Particularly appreciated are the contributions of written examples of current assessment practice.

References

- James, R., McInnes, C. and Devlin, M. (2002) *Assessing Learning in Australian Universities*, Australian Universities Teaching Committee <http://www.cshe.unimelb.edu.au/assessinglearning/>.
- Harris, K-L. and James, R. (2006) Facilitating reflection on assessment policies and practices: A planning framework for educative review of assessment. *Studies in Learning, Evaluation, Innovation and Development*, **3**(2), 23–36.

Appendix

Advisory Group for the project:

Professor David Boud, Professor of Adult Education, University of Technology Sydney

Dr Marcia Devlin, Senior Lecturer in Higher Education, Centre for the Study of Higher Education, The University of Melbourne

Dr Jan Meyer, Lecturer, School of Anatomy and Human Biology, University of Western Australia

Professor Roger Parish, Head of School of Life Sciences, La Trobe University

Professor Russell Tytler, Convenor, Science and Environmental Education Teaching and Research Group, School of Scientific and Developmental Studies in Education, Deakin University

Copyright ©2007 Charlotte Taylor, Mary Peat, Dawn Gleeson, Kerri-Lee Krause, Kerri-Lee Harris, Robin Garnett

The authors assign to UniServe science and educational non-profit institutions a non-exclusive licence to use this document for personal use and in course of instruction provided that the article is used in full and this copyright statement is reproduced. The authors also grant a non-exclusive licence to UniServe Science to publish this document on the Web (prime sites and mirrors) and in printed form within the UniServe Science 2007 conference proceedings. Any other usage is prohibited without the express permission of the authors. UniServe Science reserved the right to undertake editorial changes in regard to formatting, length of paper and consistency.