ENHANCING THE ASSESSMENT OF LEARNING IN AUSTRALIAN HIGHER EDUCATION: BIOLOGICAL SCIENCES

Report prepared for
The Carrick Institute for Learning and Teaching
in Higher Education

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Table of Contents

Acknowledgements

The project team would like to acknowledge the contributions made by the university staff, recent graduates, students and employers who took part in this project. In particular, we would like to thank the staff who coordinated the interviews and roundtables at their universities, and the staff who shared examples of their assessment practice on the website, *Enhancing assessment in the biological sciences*, www.bioassess.edu.au. We would also like to thank the project's international advisor Professor Dai Hounsell, who gave the project helpful and timely advice and who, with his wife, Jenny Hounsell, completed a busy schedule of speaking engagements on behalf of the project in Melbourne and Perth. The Australian Advisory Group also provided us with useful feedback and suggestions and we are grateful for the input of its members. Jess Foran helped with the organisation of seminars and painstakingly uploaded hundreds of webpages. Finally the project team would like to thank the Carrick Institute for Learning and Teaching in Higher Education for funding and supporting the project.

Executive summary

The project, Enhancing assessment in the biological sciences, was funded by the Carrick Institute for Learning and Teaching in Higher Education to develop and strategically disseminate resources designed to enhance the assessment of learning in the biological sciences in Australian universities. The project team conducted fieldwork in eight Australian universities to consult academics, students, recent graduates and employers who work in the biological sciences about: assessment issues; current approaches to assessment; and successful assessment practice. The project team then consulted the wider disciplinary community in the biological sciences in Australian higher education about assessment practices through roundtable discussions and national seminars. They used advice from this community and their own collective experience in Australian higher education to develop a website for sharing assessment resources, *www.bioassess.edu.au*.

The ***bioassess*** website: presents ideas and resources about good assessment practice and learning priorities in the biological sciences in Australian universities. It incorporates specific examples drawn from undergraduate courses in a diverse array of biological disciplines. The project website complements and builds upon the *Assessing Learning in Australian Universities* website, a previous project from the Centre for the Study of Higher Education, widely recognised for its contribution to enhancing teaching and learning in higher education.

The primary deliverable from the project is a website displaying ideas and resources for university educators in the biological sciences, *Enhancing assessment in the biological sciences*: www.bioassess.edu.au. This website delivers several outcomes, as foreshadowed in our original project brief, including:

- a detailed compilation and synthesis of the core learning outcomes in the biological sciences, including generic skills;
- a rich dataset on contemporary assessment issues in biological sciences based on the views of practitioners; and
- a set of examples of best practice in assessment in the biological sciences in a range of institutional and program settings, including across year levels and fields.

A further important outcome of the project included the capacity-building dimension within the discipline. The half-day roundtables in each state, along with the two dissemination seminars provided opportunities for academics teaching biological science to: 1) discuss assessment issues; 2) consider best practice; 3) analyse the question of academic standards; and 4) establish ongoing communication channels for discussion of these issues and the sharing of best practice.

The project has raised the awareness of the community of university educators in the biological sciences about innovative and successful assessment practice. The project's consultation process has generated an ongoing desire for practitioners to continue to meet on a regular basis to discuss matters of common concern in university education.

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1 Overview of project

1.1 Introduction

This report describes a national project led by the Centre for the Study of Higher Education (CSHE), (The University of Melbourne), in partnership with leaders in teaching and learning in the biological sciences from The University of Sydney and The University of Melbourne. It was funded by the Carrick Institute for Learning and Teaching in Education to raise awareness and stimulate improvements to assessment in the biological sciences.

Drawing upon their own experiences and consultation with people involved in higher education in the biological sciences - university staff, students and employers across Australia - the project team developed a website, *www.bioassess.edu.au* which highlights contemporary issues in assessment and presents effective and innovative approaches to enhancing assessment in higher education. While the website has a focus on the biological sciences, it also has relevance to other areas of university study.

The main methods and achievements of the project are described in the *bioassess* website. This report complements, rather than duplicates, the content of the *bioassess* website.

1.2 The aims of the project

The aims of the project were:

- to gain insights and examples of good assessment practice in the biological sciences from tertiary educators, students, recent graduates and employers;
- to use the professional expertise of the project team to build on these insights and examples and to develop resources that would enhance assessment;
- to design curriculum-level resources and frameworks for use in the biological sciences; and,
- to strategically disseminate these resources and engage the disciplinary community in ongoing discussion of assessment by means of a website, seminars and consultations in every State.

1.3 The project team

The project team involved collaboration between The University of Melbourne and The University of Sydney, with the Centre for the Study of Higher Education as the lead agency.

The Project team, members were:

- Kerri-Lee Krause (project co-leader)*, Kerri-Lee Harris (project co-leader), and Robin Garnett, *Centre for the Study of Higher Education, The University of Melbourne*;
- Dawn Gleeson, *Department of Genetics, The University of Melbourne*; and
- Mary Peat and Charlotte Taylor, *School of Biological Sciences, The University of Sydney*

* Now Griffith University

For more details about the project team, see the Appendix of this report and http://www.bioassess.edu.au/bioassess/go/home/pid/19

1.4 The significance of the project

The project team's main goal has been to enhance assessment practice in the biological sciences. One of the important steps in fulfilling this goal has been to create and maintain a community of practice amongst educators in the biological sciences in which assessment resources are shared and strategies for sustainable curriculum change are identified and communicated. Such community-building around the theme of assessment in biology benefits all academics, but particularly those in regional or smaller universities in which the disciplinary community may be small.

We also sought to contribute to community empowerment by highlighting a range of strategies for benchmarking its assessment and curricula at the national and international level, with a view to maintaining rigour and standards in the biological sciences. The project resources have therefore been developed in collaboration with experts in the field, both nationally and internationally.

The project team has focused on all year levels but recognises the particular importance of the first year. The CSHE national study of the first year experience identified a number of significant dimensions of the student experience in science (Krause et al., 2005[1]). First year science students nationally report that they have a higher number of course contact hours, spend more days on campus, and have a greater sense of belonging to the learning community than their peers in other disciplines. First year science students are more likely to find their course workload to be too heavy. The curriculum level resources include many examples of first year assessment and make a point of emphasising a balance in the range and extent of assessment tasks.

In light of the value of peer collaboration both in and out of class (Peat et al., 2001[2]), the project paid special attention to assessment strategies which further encourage a sense of belonging to the learning community and provide opportunities to connect with peers within and beyond the formal class setting. CSHE research has also shown that science students are more likely to make use of web-based resources and information (Krause et al., 2005[1]). Knowing that ICTs are transforming student learning and engagement, the project has sought to explore creative, pedagogically sound approaches to assessment for the 'net-savvy' generation. These include online formative and summative assessment opportunities, including real-time online feedback.

1.5 Key terms and definitions

'Biological science' is used here in its broadest sense, encompassing all life sciences. Included are such long-standing disciplines as zoology, botany and anatomy, along with more recently defined fields such as biochemistry, environmental science, genetics and developmental biology. The focus of the project is upon undergraduate study, including broad programs in science and biomedical science, along with more specialised studies such as dietetics, aquaculture and horticulture.

Explanations of some terms commonly used in assessment are given on the website under *Principles of assessment* at: http://www.bioassess.edu.au/bioassess/go/home/pid/13

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[1] Krause, K., Hartley, R., James, R., & McInnis, C. (2005). *The first year experience in Australian Universities: Findings from a decade of national studies*. Project funded by the DEST Higher Education Innovation Program.

[2] Peat M., Dalziel J. & Grant A.M. (2001) Enhancing the first year student experience by facilitating the development of peer networks through a one-day workshop. *Higher Education Research and Development* 20(2) 199-215.

2 The project rationale and context

2.1 Rationale for project methodology

The primary goal of the project was to promote and support strategic change in learning, teaching and curriculum development of biology in Australian universities. This has been progressed through the development and dissemination of resources to enhance and transform approaches to assessment in the discipline. The project team has attached the highest priority to collaborating with representatives of the discipline across the Australian higher education sector in order 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.

The project team adopted a strategic approach to generating and disseminating resources in order to support long-term and sustainable change in the discipline. Through the vehicle of the *bioassess* website, we have, at one level, presented practical strategies for both formative and summative assessment that are of immediate relevance and usefulness in learning and teaching. At a broader and more strategic level we have produced resources designed to support sustainable transformation of assessment practices through an emphasis on their role in curriculum design, delivery and evaluation.

Our approach to the project has:

- recognised the central role that assessment plays in curriculum enhancement;
- recognised the importance of assessment in setting and monitoring academic standards; and
- recognised the different needs of academics who are carrying out classroom teaching and those who are in curriculum leadership roles.

The project method has

- involved extensive consultation with the disciplinary community;
- facilitated the sharing and adoption of good practice and establish the pre-conditions for future benchmarking;
- built on previous Australian work, in particular the AUTC *Assessing Learning in Australian Universities* project; and,
- drawn on existing networks and resources, such as UniServe Science.

Through fieldwork in eight universities and a series of 'roundtables' in each state, the project has produced a website, *Enhancing Assessment in the Biological Sciences: ideas and resources for university educators*, which, through its linkage with UniServe Science, provides an ongoing forum for the sharing of assessment resources.

The project team has developed the website to reflect and take account of a range of learning styles, experiences and contexts. The new materials, while situated in the biological sciences domain, are widely applicable across the disciplines.

2.2 The context for the project

The discipline of biological science includes old disciplines like zoology, botany and anatomy, along with the more recently defined fields of biochemistry, ecology, genetics, developmental biology and others – the common element being that all involve the study of life.

Biologists understand the unity and diversity of life, the principles of heredity and evolution, and the levels of organisation that characterise living things. Learning in the biological

sciences involves building such understanding, and effective teaching of biology both encourages and measures such learning. Students often undertake highly general first year programs, which later branch into sub-fields that require more specialised knowledge, the capacity to deal with more 'open-ended' situations, and stronger problem-solving skills.

The careers of students of the biological sciences are diverse, including roles in the multi-disciplinary bioscience at the forefront of Australian research and innovation. Advances in medicine, agriculture and environmental-sustainability rely heavily upon studies in the biological sciences — the priority given to biotechnology is evident in recent government and university investment in biotechnology centres of research excellence such as Queensland's Institute for Molecular Bioscience and Victoria's Bio21 Molecular Science and Biotechnology Institute. Paradoxically, however, the project coincides with a downturn in the apparent appeal of science in Australian education. The number of undergraduate students attracted to science declined steadily during the last decade and, at the school level, there has been growing concern regarding the qualifications of teachers and their capacity, and that of curricula, to effectively prepare and enthuse young people for careers in the sciences (Harris et al., 2005).

2.3 The role of assessment in enhancing learning and teaching

The project team has focused on the relationship between assessment design and the effectiveness of student learning in the biological sciences in the belief that enhanced assessment is integral to advancing learning and teaching in Australian universities. It is widely recognised that assessment practices send powerful messages to students about the learning that is most valued and most highly rewarded, and thus about the best approaches to study. Well designed assessment contributes to effective approaches to learning. Despite this, there are well-documented challenges to improving assessment practices, including large classes, the diversity of student backgrounds and language skills, and the heightened risk of plagiarism. In this regard, assessment is critical to the effective monitoring of academic standards, for it provides the ultimate reference point for student achievement and student capabilities.

This philosophy was successfully employed in the CSHE project for the AUTC — *Assessing Learning in Australian Universities* — which offered a series of assessment principles and emphasised that these need to be located within a disciplinary context if learning and teaching are to be enhanced. The current project team firmly believes that disciplinary cultures shape fundamental beliefs about the nature of knowledge, the best ways for students to learn and the most effective ways to teach. While generic principles have value, they are necessarily limited in their utility to practitioners. Clearly, excellent teachers combine extensive disciplinary knowledge with equally extensive disciplinary pedagogical knowledge: that is, they know precisely how to teach in their field and they know how students should approach their learning. These two forms of knowledge are intimately related. Enhancing assessment, therefore, as with other aspects of learning and teaching, is very much a discipline-based matter.

We contend that if long-term change is to take place in the discipline of biology — or any discipline for that matter — while maintaining disciplinary standards and conceptual rigour, transformation must occur at the curriculum level. The concept of curriculum can be interpreted in numerous ways, from a rather narrowly focused emphasis on 'content' and relaying discipline facts to a more holistic view that encompasses facets of knowledge transmission as well as 'hands-on' skills training and the enhancement of reflective and critical thought. This project did not seek to change the way in which discipline material is taught per se but sought to facilitate change in approaches to curriculum design by biology

educators, especially those in program coordination and leadership positions who can play significant roles in bringing about systemic change in approaches to assessment.

2.4 Research questions guiding the project

The project team identified six key research questions that were informed by current research and practice in the biological sciences and that underpinned the methodology for this study. These questions were:

1. What learning outcomes are important for all students of biology and what are the implications for assessment in the discipline?
2. What are the current trends in curricula in the discipline overall and in its sub-fields? What are the major issues in assessment as identified by staff?
3. What is the nature of best practice in the assessment of core learning outcomes? What is the nature of best practice in the assessment of generic skills and higher order skills? What are the trends in innovation in assessment? Who are the leading innovators?
4. What forms and formats of practical ideas, exemplars and ready-to-use resources will be most easily adapted and adopted by academics teaching in the discipline?
5. In the context of biological science curricula, how can strategic, sustainable change in the discipline be supported through transformation of assessment practices? How can assessment standards be monitored? Can these approaches benefit other disciplines?
6. How can the project outcomes be best made available and shared within the discipline community? How can the discipline community be supported in the ongoing sharing of assessment resources and discussion of assessment practices and assessment standards?

The methodology used to examine these questions is the subject of the next section.

3 The project methodology

The project team members consulted colleagues and experts, and used their own experience in higher education to develop the *bioassess* website for sharing resources. The methodology used is summarised at http://www.bioassess.edu.au/bioassess/go/home/pid/18

3.1 Consultation and dissemination strategies for the project

The project team regarded the consultation process as an important precursor for the dissemination of the project outcomes. That is, those consulted during the course of the project are likely to become the people who are most interested in implementing the project's outcomes and promulgating its value to others. Therefore the project team consulted widely in the biological sciences sector both to gather and to disseminate information for the project. The consultation-dissemination process included:

- interviewing staff, recent graduates and students in eight universities;
- interviewing employers;
- consulting academics in every state in roundtables discussions;
- consulting an Advisory Group of Australian experts in the field;
- consulting an overseas expert, Professor Dai Hounsell; and,
- inviting academics from every Australian university to attend a seminar on *Enhancing assessment in the biological sciences.*

3.2 Ethics approval

The project team submitted an ethics application for the project to the Human Research Ethics Committee at The University of Melbourne, which was subsequently approved. The seven other universities involved in staff and student interviews for the study accepted this approval for their purposes.

3.3 Interviews

To ensure adequate coverage of institutional and program diversity, the project team conducted fieldwork in the eight universities listed below, which included the two host universities of the project team members. The sample encompassed ATN, Go8 and regional institutions and was dispersed across five states. The institutions were chosen with consideration to the quality and distinctiveness of their programs in the discipline of biological sciences:

The University of Melbourne	The University of Sydney
Charles Sturt University	Curtin University of Technology
Deakin University	Flinders University
University of Queensland	Queensland University of Technology

Initially the project directors contacted the Vice Chancellors of the eight universities and gained their support for the project. The Vice Chancellors nominated contact staff in their universities' biological sciences areas to liaise with the project manager. These contact staff organised a succession of one-hour interviews between a project team member and a university staff member, and one-hour focus groups between a project team member and a small group of university students or graduate students. Some of the staff interviews included more than one staff member. In total, the project team completed interviews with 57 staff, and 47 students and recent graduates.

3.3.1 Interviews with staff

Individual project members held one-on-one (or occasionally one-on-two) interviews with academics who teach in the biological sciences. Each project member conducted all the

interviews in one or two of the eight universities selected for study. The interviewer followed a set sequence of questions to elicit the academic's views on the learning objectives of a degree in the biological sciences, assessment practice that promotes student learning, and key issues in assessment in the biological sciences. After the interview, the project member invited the academic to submit examples of his/her own assessment practice for sharing with colleagues on a new website. Each interview was recorded using a digital recorder and either summarised or transcribed for later analysis.

3.3.2 Interviews with recent graduates

Focus group discussions were held with small groups of postgraduate students in each of the eight universities in the study. Twenty five postgraduate students were interviewed altogether. These students were generally PhD or Masters students.

3.3.3 Interviews with students

Focus group discussions were also held with five small groups of undergraduate students in five universities in the study. Twenty two undergraduate students were interviewed altogether. These students were generally third or fourth year students.

3.3.4 Interviews with employers

The project team considered it important to canvass the views on assessment of employers of graduates from biological science degrees. They interviewed two senior research scientists in Primary Industries Research Victoria and asked them what abilities they were looking for when they employed new graduates. They also analysed the responses of employers whose views were recorded on the University of Sydney's "Lifelong Earning" website: http://www.lifelongearning.science.usyd.edu.au/

3.4 Advisors

3.4.1 The Advisory Group

A project advisory group was formed; selected for the members' expertise in higher education and/ or teaching in the biological sciences. It was composed of the following people:

- Professor David Boud, Professor of Adult Education, University of Technology Sydney;
- Dr Marcia Devlin, Senior Lecturer, Centre for the Study of Higher Education;
- Dr Jan Meyer, Lecturer, School of Anatomy and Human Biology, University of Western Australia;
- Professor Roger Parish, Head of School of Life Sciences, Pro Vice-Chancellor/Deputy Chair Academic Board, La Trobe University; and,
- Professor Russell Tytler, Convenor, Science and Environmental Education Teaching and Research Group School of Scientific and Developmental Studies in Education, Deakin University.

The Advisory Group met three times and provided very useful information and feedback to the project team. The Group formed part of the panel of experts who provided feedback on the website at various stages in its development.

3.3.2 International expert advisor

Professor Dai Hounsell, Professor of Higher Education at Edinburgh University and expert in assessment was the overseas advisor for the project (and for the WA project, *Online Assessment Feedback as an Instrument of Reflective Learning Practice in Human Biology)*. Professor Hounsell reviewed the draft Web architecture that the project team had derived from the interview data. He made useful suggestions that influenced the structure and the

content of the website. He also visited Melbourne and Perth between December 1 and 12, 2006 to advise both biology assessment projects and to be the keynote speaker at the 2006 Carrick National Assessment Project Forum at CSHE and seminars on assessment in the biological sciences held in Melbourne and Perth.

3.5 Roundtable discussions

During September and October 2006 a second round of consultations with tertiary educators was conducted by the project team. The purpose of these consultations was to review the issues raised in the interviews and the draft conceptual structure of the website, and to gather more examples of good assessment practice. The project team also used the consultations to raise interest and generate a sense of ownership in the new website resource amongst its key stakeholders.

Roundtable consultations took place in NSW, Queensland, Victoria, South Australia and Tasmania. Practising tertiary educators in the biological sciences from every university in Australia were invited, and 55 academics from 20 different universities participated. Issues relating to assessment were raised and discussed, leading to further adjustments to the conceptual structure and content of the website.

3.6 UniServe Science conferences

Project team members presented information about the project at UniServe Science conferences in Sydney in September 2005 and 2006. In the 2005 conference, they invited expressions of interest in participation in the project. The biologists that volunteered their names were later invited to join the project's roundtable discussions and seminars. In 2006, the UniServe conference included the NSW roundtable discussion about the structure of the draft website. Participants gave feedback to the project team and contributed examples of their own assessment methods.

At the 2007 UniServe Science conference, the completed website will be demonstrated. A paper and poster about the project will be presented, and the ongoing involvement of UniServe Science in displaying examples of additional examples of assessment methods will be highlighted.

3.7 National seminars

3.7.1 Two national seminars, *Enhancing Assessment in the Biological Sciences*

Two national seminars entitled, *Enhancing Assessment in the Biological Sciences*, were held in Melbourne and Perth on December 7 and 12 respectively. [See seminar flyer in the Appendix]. Senior academics from the science faculties of every university in Australia were invited to come or to send a representative. The project teams from the Melbourne and Perth biology assessment projects funded by the Carrick Institute spoke about their projects. Professor Dai Hounsell was the keynote speaker and addressed the topic, *Teaching, learning and assessment in the biological sciences*. For an hour during each seminar, participants broke into smaller groups (three groups in Melbourne; two groups in Perth) to share successful strategies for addressing particular assessment issues such as *Strategies for using the assessment of group work to enhance student learning in the biological sciences.* Some of the strategies raised during these sessions were later incorporated as 'examples' into the new website.

3.7.2 Outcomes from national seminars

Altogether 130 participants from 24 universities took part in the national seminars. The feedback from the seminars indicated that participants appreciated the chance to meet and

discuss assessment with other academics in the biological sciences. They expressed the wish to repeat the seminars on an annual basis.

3.8 Ongoing collection of resources

The administrators of UniServe Science agreed that further examples of assessment could be made available to the community of biological scientists via the UniServe Science website (http://science.uniserve.edu.au) since the new website, *www.bioassess.edu.au,* is a static site. Accordingly weblinks were set up between the two websites, with invitations to contribute further examples to the UniServe Science website on both websites.

3.9 National Carrick Assessment Project Forum

3.9.1 Carrick National Assessment Project Forum

The Centre for the Study of Higher Education facilitated a Carrick National Assessment Project Forum, with Professor Dai Hounsell as the key speaker, on 6 December 2006. All assessment projects funded by the Carrick Institute were invited to attend. The purpose of the forum was to share ideas and expertise in conducting assessment projects and to discuss key issues and questions with Professor Hounsell that participants had foreshadowed before the forum. The two Carrick biological assessment projects were amongst the 12 other assessment projects profiled at the forum. [See Forum Flyer in Appendix]

3.9.2 Outcomes from National Carrick Assessment Project Forum

Twelve assessment projects funded by the Carrick Institute were represented by one, two or three members of their teams at the forum. Participants reported that they found the Forum very worthwhile. [See Brief report of the Carrick National Assessment Project Forum in Appendix].

4 Website development and dissemination

4.1 Introduction

The *bioassess* website is the main vehicle whereby the project team shared the findings of the consultations with colleagues in the biological sciences. The website includes the project team's informed comments and advice; as well as examples of good assessment practice provided by Australian university educators.

4.2 The website development process

After interviewing academic staff, students, recent graduates and employers, the project team developed the conceptual structure for the website, *Enhancing Assessment in the Biological Sciences*, to reflect the main assessment practices and issues that emerged from these interviews. The architecture was reviewed by the project's international expert advisor, Professor Dai Hounsell. He sent detailed suggestions for improvements which were incorporated into the next draft of the conceptual structure. The revised structure was discussed with university academics, who teach in the biological sciences, at roundtables in five states and amended in the light of their feedback. [See Website Architecture in Appendix]

The Carrick Institute worked with the project team to develop the design of the new website based on the design of its own revised website. The Carrick Institute's aim was to develop the template for a generic project website that could be used or adapted for future Carrick projects. Project team members uploaded and reviewed the website content.

4.3 Website overview

A brief illustrative outline of the key parts of the website is provided below.

4.3.1 Learning outcomes in the biological sciences

During the course of the project, the project team discussed learning outcomes with staff, recent graduates and employers. Academics were asked what they believed biology graduates should know and be able to do; postgraduate students were asked what learning they most valued from their undergraduate studies; and employers were asked what qualities they were looking for when they employed new graduates.

The *bioassess* website section, "Learning outcomes in the biological sciences", incorporates the findings from the interviews with staff, students, recent graduates and employers.

4.3.2 Principles of assessment

The multiple purposes of assessment and some of the language used to describe assessment are described under the *bioassess* menu item, "Principles of assessment".

4.3.3 Assessment types

The methods of assessment used by academics were classified into eleven main assessment types. Each type was described and illustrated with quotes and examples from academics under the menu item, "Assessment types".

4.3.4 Key issues

Seven key issues emerged from discussions with academics as contemporary 'triggers' for creative approaches to enhancing assessment in the biological sciences:

- Addressing plagiarism issues

- Assessing generic skills
- Engaging large classes through assessment
- Enhancing assessment for diverse student groups
- Setting and monitoring standards
- Providing feedback
- Training sessional staff

Each key issue was described in the *bioassess* website and cross-referenced to both 'Assessment types' and 'Curriculum matters', as appropriate. Examples of assessment practice that address each of the key issues were linked to the relevant webpages.

4.3.5 Curriculum matters

A key to enhancing assessment in the biological sciences is to ensure that assessment activities are designed as part of an holistic approach to designing the student learning experience in each subject or program of study. This means adopting an integrated approach to all aspects of the curriculum, from learning objectives, to instructional activities and student assessment and feedback.

A section of the website, 'Curriculum matters', was specifically developed to provide resources for those responsible for designing curricula in the biological sciences. This section provides selected examples of how Australian biologists have planned curricula within and across year levels, and have developed strategies for achieving a closer alignment between student learning outcomes and assessment in the discipline. Also addressed in this section is the issue of how to design curricula that include creative approaches to assessment in a context of resource constraints and with pressures to cover more and more content in teaching.

The *bioassess* website also includes strategies for maintaining standards through benchmarking of the curriculum and assessment practices, along with tips for achieving a closer connection between disciplinary research and teaching through effectively designed assessment in the biological sciences.

4.4 Review and feedback process

The state-based roundtable participants provided the project team with very helpful feedback on the initial structure of the website. It was important to ensure that the structure was user-friendly and that the various sections of the website were seen to be relevant and helpful by key members of the disciplinary community. Several changes were made to the website on the basis of this feedback. Once the website development was complete, the URL was sent for review to members of the Advisory Group, to the project's international expert advisor, Professor Dai Hounsell, and to five leading Australian educators in the biological sciences. Various amendments were made as a result of this valuable feedback.

4.5 Dissemination of the website URL

The project team consulted with academics in the biological sciences about the most effective way of disseminating information about the new project website. Taking their advice, the project team developed a 3-fold, full colour A4 flyer about the project which featured the web address prominently. The inside of the A4 page was designed as a poster that could be pinned onto staff notice boards. A bookmark advertising the URL was also designed.

To publicise the website, five thousand copies of the flyer and eight thousand copies of the bookmark were distributed – to teaching staff through Deans of Science and academic development units at every Australian university; to participants at relevant seminars and conferences, and widely amongst tertiary educators in the Biological Sciences in Australia for the start of the 2008 academic year.

5 Project outcomes and concluding remarks

5.1 Project outcomes and deliverables

The project team sought to achieve a high level of influence in the community of biological scientists through the process of fieldwork and roundtable consultation, the production of high quality resources, the strategic dissemination of resources, and through disciplinary community building. The overarching goal was to enhance learning and teaching through the use of effective, authentic assessment and to support the monitoring of the quality of student learning.

The primary deliverable from the project is the website with ready-to-use, downloadable resources, *Enhancing assessment in the biological sciences*: www.bioassess.edu.au. This website delivers several outcomes, as foreshadowed in our original project brief, including:

- a detailed compilation and synthesis of the core learning outcomes in the biological sciences, including generic skills;
- a rich dataset on contemporary assessment issues in biological sciences based on the views of practitioners; and
- a set of examples of best practice in assessment in the biological sciences in a range of institutional and program settings, including across year levels and fields.

A further important outcome of the project included the capacity-building dimension within the discipline. The half-day roundtables in each state, along with the two dissemination seminars provided opportunities for academics teaching biological science to: 1) discuss assessment issues; 2) consider best practice; 3) analyse the question of academic standards; and 4) establish ongoing communication channels for discussion of these issues and the sharing of best practice.

The long-term outcomes anticipated for the project include:

1. a richer understanding among academics in the biological sciences of the role of assessment in learning and teaching and the range of possible approaches;
2. the uptake of effective, innovative practice in assessment and the use of innovative assessment approaches;
3. invigorated curricula which accommodate the need for a diversity of assessment opportunities; and
4. a network of practitioners sharing ongoing ideas and issues, supported by UniServe Science.

The consultation and web development processes undertaken by the project team have initiated progress in the achievement of each of these outcomes.

5.2 Concluding remarks

As a result of the success with which this project has contributed to the biological sciences disciplinary community across Australia, the Carrick Institute may give consideration to strategies such as the ones outlined below in order to continue to support this community of practice across Australian universities:

1. Create and maintain a prominent link between the Carrick website and the *bioassess* website.
2. Generate publicity for the *bioassess* website through the Carrick website.
3. Support networks of academics who teach in the biological sciences to discuss issues relating to assessment in order to build on the national interest that this project has generated.
4. Support and reward university educators who develop curricula that foster innovative, effective assessment practices in the biological sciences.
5. Encourage scholarly research relating to innovative, evidence-based assessment practices in the biological sciences.

Appendices

A. Qualifications and experience of the project team

B. Interview questions for academic staff

C. Summary table of interview participants

D. Website architecture

E. Summary of participation at roundtable discussions

F. Flyer for the National Seminars on Assessment in the Biological Sciences

G. Flyer for the National Carrick Assessment Project Forum

H. Report on the National Carrick Assessment Project Forum

Appendix A
Qualifications and experience of the project team

Centre for the Study of Higher Education, The University of Melbourne (lead agency)

Professor Kerri-Lee Krause * is a national expert on the first year undergraduate experience and was the project director for the recent National Study of Trends in the First Year Experience. She has managed several other successful research projects and her research interests focus on the transition of students from secondary school to university. Her disciplinary background of educational psychology brings to the project expertise in understanding conditions for effective learning and teaching in the undergraduate years. She also has detailed working knowledge of online learning environments and the possibilities for online assessment.
* Professor Krause is now Director of the Griffith Institute for Higher Education, Griffith University

Dr Kerri-Lee Harris has both teaching and research experience in the field of cell biology. At the CSHE she has conducted research into science teaching and was principal author of *Who's Teaching Science?* (2005), a major national report commissioned by the Australian Council of Deans of Science. She led the evaluation of the STAR peer-tutoring program in science at Murdoch University. During 2005 she developed a novel framework to guide and support a review of assessment policies and practices at the University of Melbourne.

Ms Robin Garnett has taught science education courses at the University of Canberra and the University of Western Australia. She has been the project manager for a number of education projects, including *Learning outcomes and curriculum development in Australian physiotherapy education* (2005).

Department of Genetics, Faculty of Science, The University of Melbourne

Associate Professor Dawn Gleeson won the Australian Award for University Teaching for Biological Sciences, Health and Related Studies in 2003 and has won numerous teaching awards at the University of Melbourne. She is Director of First Year Studies in Biology and lectures in the Bachelor of Science and Bachelor of Biomedical Science. She presently coordinates the assessment of 1500+ students studying Biology, including both formative and summative assessment and the assessment of evaluation skills.

School of Biological Sciences, Faculty of Science, The University of Sydney

Associate Professor Mary Peat was Director of First Year Biology for 15 years, during which she developed a variety of formative and summative assessment approaches, including online self-assessment modules to help students monitor their own understanding – these have been disseminated through conferences and publications. She won a Quality Teaching Award in 2003 from the NSW Minister for Education and Training and the Australian College of Educators, and has won two outstanding teaching awards from the University of Sydney. She was recently

appointed Director of Teaching and Learning for the College of Sciences and Technology.

Dr Charlotte Taylor is the Associate Dean for Learning and Teaching in the Faculty of Science and holds a University Excellence in Teaching Award. She is a former deputy director of First Year Biology and has extensive experience in course design, assessment and online learning for large classes of over 1500 students. She is Chair of the Science Faculty Education Research Group (SciFER) and has published collaborative papers in areas of learning through writing, teaching large classes, giving feedback and online discussions. She is currently involved in two SciFER-funded projects on student understanding and use of feedback for written assignments, and two university-funded teaching improvement projects on Generic Skills and on enhancing the use of student feedback in course improvement and design. Her work on understanding threshold concepts in biology will be extended, in a 2006 study in Australian and UK universities, to encompass investigations of teachers' conceptions of troublesome knowledge.

Appendix B
Interview questions for academic staff (including sessional staff)
Carrick Biological Sciences Assessment Project

Introduction

- *thank-you*
- *brief outline of the project/ any questions about project?*
- *project is gathering and sharing ideas not comparing universities*
- *confidentiality, and permission to record the interview*

Questions *[adjust order and time allocation in response to the conversation]*

1. Start with some **background**: can you **describe your involvement** (past and present) in biological science teaching and assessment?
   Units and courses: year levels; courses; ugrad/pgrad?
   Role in assessment: marking; designing; coordination?

2. Can you tell me something about the **assessment** you use?/ What are your views on …?
   - *the **mix** and **timing ?***
   - *other **un-graded assessment?***
   - ***Feedback**?*
   - *how are **expections** are communicated to students?*
   - ***marking?***
   - *assessment **decision making** and **review?***
   - *what **works well** and what is particularly **challenging?***
   - *what would you **change**, if you could?*

3. From your perspective, what do you hope (BS) **students will know** and be able to do, at the end of their studies? *(If appropriate, incorporate this question in Question 2)*

4. What role do **sessional staff** play in assessment in your subject/course? What forms of professional development/**training** do you believe are important for these staff? What PD do they receive?

5. Is **maintaining standards** an issue for you? If so, how do you address it?

6. What are the major **assessment issues** or **opportunities**, as you see them, in biological sciences?

Optional question, depending on time …
7. What is the role of assessment in introductory, broad biology subjects in preparing students for later, more specialised studies?

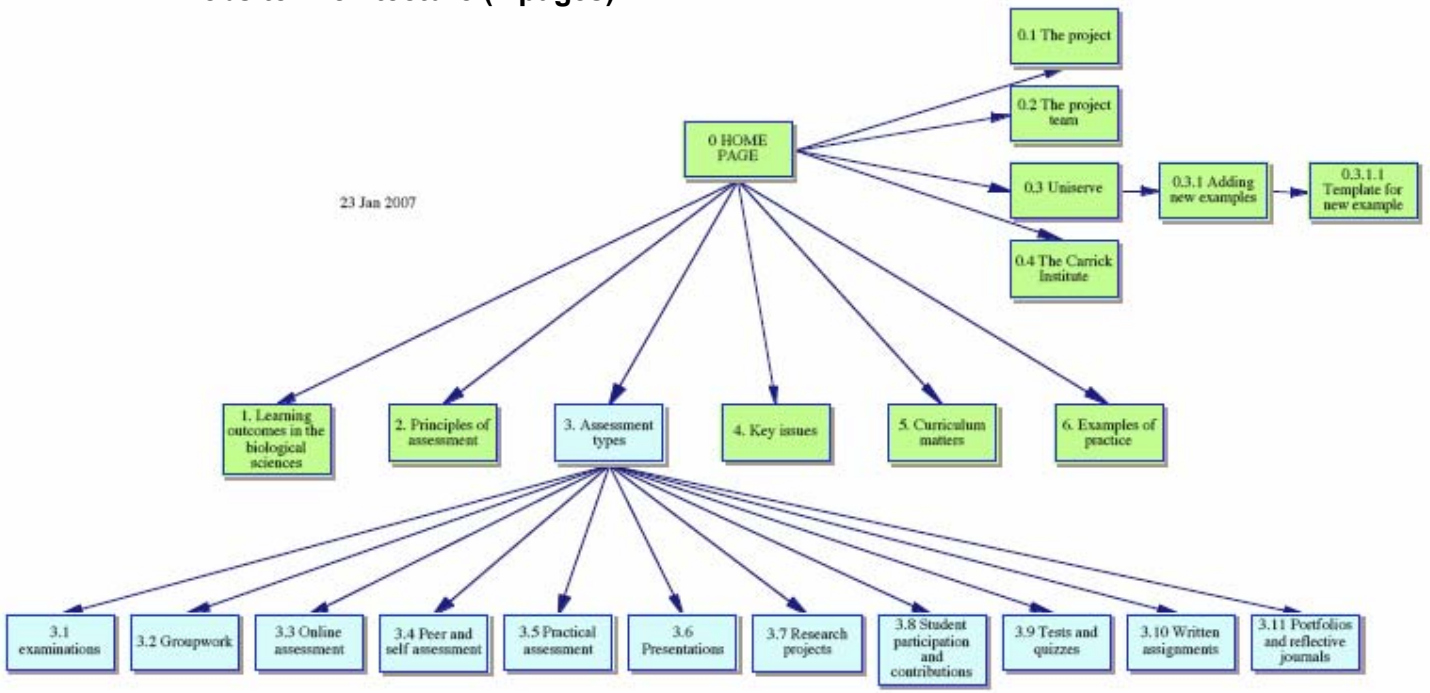
For the more experienced/senior staff…
8. Do you see **changes in the biological sciences field** that impact upon the way the subjects are taught and assessed now and into the future, compared to (say) 5-10 years ago? What are the implications for us as educators?

Thank-you, and invitation to contribute to resource collection [example or case studies]

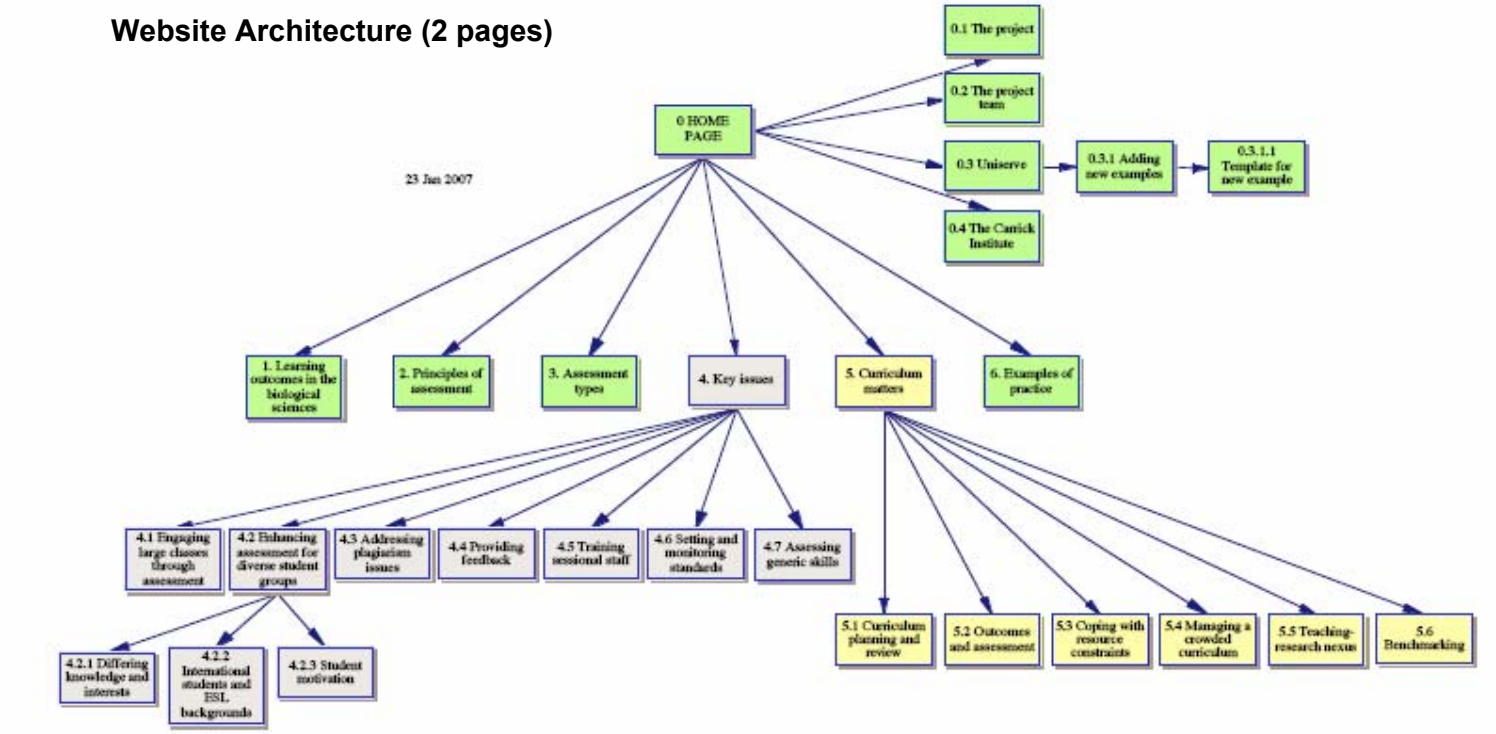
Appendix C
Summary table of interview participants

University	Number of staff interviews	Number of postgrad student interviews	Number of undergrad student interviews
Curtin University of Technology	8	3	
The University of Sydney	7	3	
University of Queensland	7	3	3
Flinders University	10	2	
The University of Melbourne	7	4	3
Queensland University of Technology	6	6	5
Charles Sturt University	6	2	2
Deakin University	6	2	9
Total	57	25	22

Appendix D
Website Architecture (2 pages)



Website Architecture (2 pages)



Appendix E
Summary of participation at roundtable discussions

Date 07	State	Host	Number of participants	Number of participant universities	Facilitator(s)
14 Sept	Roundtable Vic	Univ of Melb Kerri-Lee Krause	9	5	Kerri-Lee Krause and Dawn Gleeson
29 Sept	Roundtable NSW	Univ of Sydney Mary Peat	12	8	Mary Peat and Dawn Gleeson
5 Oct	Roundtable SA	Flinders Univ Kathy Schuller	13	3	Dawn Gleeson and Robin Garnett
12 Oct	Roundtable Q	QUT Megan Hargreaves	12	5	Mary Peat and Robin Garnett
11 Oct	Roundtable Tas	UTAS Sue Jones	9	1	Sue Jones
	TOTAL		55	20 different universities	

Appendix F
Flyer to advertise national seminars

Enhancing Assessment in the Biological Sciences: two national seminars

Melbourne: Thursday 7 December 2006 10am – 3.15pm

Venue: Wood Theatre, Economics and Commerce Building, The University of Melbourne
Hosted by The Centre for the Study of Higher Education (CSHE), The University of Melbourne

Perth: Tuesday 12 December 2006 10am – 3.15pm

Venue: St George's College, The University of Western Australia
Hosted by The Centre for the Advancement of Teaching and Learning (CATL),
The University of Western Australia and CSHE, The University of Melbourne

Both seminars feature:

- **New biology assessment resources for university teachers**
- **Key outcomes from two national projects on assessment in the biological sciences, funded by the Carrick Institute**
  - **Enhancing the Assessment of Learning in Australian Higher Education: Biological Sciences**
  - **Online Assessment Feedback as an Instrument of Reflective Learning Practice in Human Biology**
- **Discussion of issues and opportunities for assessment in the Biological Sciences**
- **Keynote presenter: Professor Dai Hounsell, Professor of Higher Education, The University of Edinburgh**

Dai Hounsell's presentation will look particularly at how undergraduate biosciences students in the UK learnt ways of thinking in, and of going about, the subject, and the extent to which their learning could be helped or hindered by assessment, feedback and other aspects of course management. The presentation draws on the findings of a recent, large-scale research project he coordinated which was funded by the UK Economic and Social Research Council. His latest project, funded by the Quality Assurance Agency in Scotland, is looking at how to achieve greater coherence and integration in assessment. http://www.ed.ac.uk/etl/cvs/DaiHounsell.html

Register online at
http://www.cshe.unimelb.edu.au/bioreg

No registration fee applies. Both seminars are fully sponsored by
The Carrick Institute for Learning and Teaching in Higher Education
Morning tea and lunch will be provided.

For more information, contact Robin Garnett robinjg@unimelb.edu.au or Kerri-Lee Krause k.krause@unimelb.edu.au

Appendix G
Flyer for the Carrick National Assessment Project Forum

Carrick National Assessment Project Forum
Wednesday 6 December 2006

The Carrick Institute for Learning and Teaching in Higher Education invites all project teams, who are recipients of its funding for assessment projects, to send two members to a forum at the Centre for the Study of Higher Education (CSHE), The University of Melbourne on Wednesday 6 December 2006 from 9.30am – 3.00pm.

The forum will be facilitated by Professor Dai Hounsell, Professor of Higher Education, The University of Edinburgh, whose visit to Australia has been sponsored by the Carrick Institute. Professor Hounsell's main research interests are in the assessment of learning in higher education. For background, see: http://www.ed.ac.uk/etl/cvs/DaiHounsell.html

Purpose

The purpose of the forum is to:

- share ideas and expertise related to Carrick-funded assessment projects
- discuss issues with international expert, Professor Dai Hounsell
- form collegial networks to enhance the work of the project team members

Program

9.30 – 10.30	Project team members present a short summary of their projects
11.00 – 12.15	Discussion of key project issues and questions with Dai Hounsell
12.15 – 12.30	Reflection on project issues from an international perspective
1.30 – 3.00	Informal discussions with Dai Hounsell and between project members

There will be a maximum of thirty places available at the forum. Two places will be reserved for members of each project team. Places will be allocated in the order that registrations are received.

Register online at
http://www.cshe.unimelb.edu.au/assessforumreg

Each project team to be represented at the forum should identify two issues/ questions for discussion at the forum. Please send these to Robin Garnett (robinjg@unimelb.edu.au) by Monday 13 November.

No registration fee applies. The forum is fully sponsored by The Carrick Institute for Learning and Teaching in Higher Education and the Centre for the Study of Higher Education. Morning tea and lunch will be provided. Project members are responsible for organizing and paying for their own transport and accommodation.

For more information, contact Robin Garnett robinjg@unimelb.edu.au or Kerri-Lee Krause k.krause@unimelb.edu.au

Assessment project team members may also be interested in attending the seminar, *Enhancing Assessment in the Biological Sciences* at CSHE on Thursday 7 December. This seminar will be repeated in Perth on Tuesday December 12. Register online for these national seminars at http://www.cshe.unimelb.edu.au/bioreg

Appendix H
Report of the National Carrick Assessment Project Forum, organised by the Centre for the Study of Higher Education at the University of Melbourne on 6 December 2006

The Carrick Institute for Learning and Teaching in Higher Education funded a meeting of twenty eight academics who are conducting Carrick-funded projects on subjects related to assessment.

1. The purpose of the Forum was to:

- Share expertise about assessment projects
- To discuss issues with international expert, Professor Dai Hounsell, Professor of Higher Education at Edinburgh University
- To form collegial networks to enhance the work of the project team members

2. The program

The organisors arranged the program for the day to meet these three objectives. Elizabeth Macdonald, Director, Carrick Institute Grants Scheme, welcomed participants, saying that the Carrick Institute was charged by the Commonwealth Government to improve assessment in higher education in Australia. Participants then introduced themselves, and each project team gave a short presentation summarizing its project. After this, Professor Dai Hounsell, spoke to the group, framing his talk around three topics:

- Effective approaches to self and peer assessment
- Assessing professional performance
- The role of professional development and leadership in enhancing assessment

The topics were derived from questions and issues that participants had sent to the organisors prior to the Forum. After lunch, the whole group listened while Dai answered questions and discussed issues with each project team in turn. The Forum ended with a period of informal discussion between participants. Details of the program for the day and the list of participants are included as appendices.

3. Some points made by Dai Hounsell in discussion with participants:

- **On dissemination**

It is important for project leaders to ask "who needs this work?" and "do they want it?". Communication with the end users of a resource is vital – preferably have an ongoing relationship between the people producing a resource and those who want to use it. Some people like to learn with new theory first and illustrative examples second whereas others prefer to start with a real problem, such as a problem in a case study, and follow on to the relevant theory. If possible, when developing a new resource, provide a variety of ways of accessing the materials. Often it is useful to give people a small sample to whet their appetite. One way to test the success of a new resource is to put it on a website and monitor how often people access the site.

There is an enormous range of assessment practices within and across universities and year levels. It is instructive to provide some fresh discussion material and have meetings of academics from different disciplines within one university, and from the same discipline within different universities.

- **On teamwork**

There are generally two outcomes from teamwork: the content output and the learning that comes from working together. However students have different strengths and contribute to teams in different ways. Some students might talk far more than others but a quiet student might have an important mediation function within the group. In a Scottish study it was found that no self assessment tasks are unmoderated. A participant gave an example in speech therapy in which the teacher and the student each give the student a mark, and then they negotiate for the final mark. Good students tend to rate themselves too low and poor students tend to rate themselves too highly.

Collaborative research can encompass the different priorities of individuals through 'deal making'. For example, a person most interested in a large-scale survey may agree to include, in their questionnaire, a question for a colleague who is primarily interested in interviews and case studies. In return, the second person includes a question in the interview schedule that will be valuable for the first. Such strategies for collaboration can ensure that individuals' needs are met while also producing a level of synergy from the team aspect of the project.

- **On assessment of professional practice and performance**

Dai is doing an analytical review of assessment. He makes a distinction between assessment in the academic domain and assessment in the professional domain. In the academic domain, the criteria for success are often made explicit, the assessment is more likely to be *ex situ* and there are established ways of grading students, for instance using criterion referenced marking. In contrast, in the professional domain, success criteria are more likely to be tacit and assessed *in situ*, and staff work in teams in which each person needs to excel in some but not all aspects the job. Perhaps people responsible for assessing in both domains need to make some compromises to improve the assessment system. For example, the professions could make their success criteria more explicit and academics could adapt their methods. For instance, in the assessment of a dance, in which holistic judgment as well as criterion based judgement is important, there might be three criteria to be assessed by academics, three by professionals and three jointly, with a non-examining chair to ensure fair play. It is important to have safeguards for students built into the process, such as a written assignment to be handed in before the performance and an appeal system.

- **On publication**

Possible places for publicising assessment projects:

- The journal *Assessment and Evaluation in Higher Education*
- The journal *Higher Education Research and Development* (HERD)

Dai recommended using the same scholarly approach to research and publication as employed within other disciplines – that is, through progressively developing and testing ideas at departmental seminars and conferences before attempting to publish. He also recommended that new authors have a colleague who is familiar with publication requirements assist with the unspoken requirements of publication.

In addition, Dai recommended a conference with a strong focus on assessment – the Northumbria/EARLI SIG Assessment Conference.

- **On peer and self assessment**

Peer and self assessment may be used for a range of purposes: for marking and grading, for evaluation, for feedback, for criterion generation or for negotiation. It is perhaps better referred to as 'student involvement in assessment'. It is a controversial area, with some educators saying that it is not ethical for students to judge other students because they lack the expertise to do it properly. Others maintain that self and peer assessment are important generic skills that students need to learn. It is important for each project team to work out its own stance on this subject.

4. The feedback from participants

At the end of the forum participants completed a feedback form. Their responses are listed in full in Appendix C. Participants indicated that they found the day valuable. They particularly appreciated the opportunity to discuss their projects with each other and to gain input from Professor Dai Hounsell.

Robin Garnett for the Project Team
The Centre for the Study of Higher Education
The University of Melbourne
31 Jan 07

…….

Forum Program for Wednesday 6 December 2007

9.00 - 9.15 Coffee/ tea and set-up (*load any PowerPoint presentations at this stage*)

9.15 – 9.30 Introductions

Session 1
9.30 – 10.30 Project team members present 5 minute summaries of their projects
10.30 – 11.00 Morning tea

Session 2
11.00 –12.30 Discussion of key project issues and questions with Dai Hounsell
12.30 – 1.30 Lunch

Session 3
1.30 – 3.00 Discussions between Dai Hounsell and project teams within the Forum

3.00 – 4.00 (Optional) Room available for informal discussion between project groups

Forum Evaluation: Feedback from Forum Participants

What were the most useful aspects of the assessment forum for you?

1. Hearing what work the other groups are doing in their projects, how they are handling problems, issues, methodology, suggestions. Meeting like-minded people.
2. Dai's drawing together of commonalities, issues and frameworks for thinking. "Looking over the fence" at other projects.
3. Networks-set up some great exchanges with other groups
4. The post lunch questions and answers with Dai. As much the other questions as our own project's questions
5. Learning about other projects
6. Opportunity to discuss projects with collaborators and others in person. Chance to come up with questions
7. Dai's words of wisdom, meeting others in similar areas, "looking over the fence" at others' projects.
8. Being introduced to other assessment projects (and the diversity and scope of project aims). Making links with projects that have relevance to departments involved with our project. Learning about new ways (technologies, processes etc) that have potential application in our project.
9. Sharing of course. Taking the wider perspective.
10. All of the discussion (including during the breaks). Meeting enthusiastic, like-minded people. Dai's ideas and suggestions.
11. Its now clear to me that one of the main challenges is to connect academia and industry without compromising the objectives of either.
12. Being able to see the diversity of projects and the unexpected applicability of aspects of many projects to our own.
13. Taking commonalities from the diverse projects and issues arising from it. Meeting other project participants.
14. Sessions in the morning/afternoon with Dai were excellent! Didn't get a lot out of the mini overview session-wouldn't bother with that one next time.
15. Learning about other assessment projects from other people. Hearing about different perspectives from different disciplines. Opportunity for comments from Dai Hounsell.
16. General overview of range of assessment issues and projects. Interesting to hear Dai's comments with regard to range of projects.
17. Dai Hounsell's answers to questions and discussion of issues. Hearing from other groups.
18. Hearing about other projects
19. Dai's knowledgeable but also very sane responses. The diversity of the projects-it's a contextualisation of the group. The generosity of the environment.
20. To get to know what other projects are about and find people working in similar areas.
21. Hearing about other projects, collaboration with those working on other projects, challenging thoughts from Dai Hounsell.

If the Carrick Institute were to hold another forum, do you have any suggestions for improvement?

1. If there is an expert in the field (i.e. Dai Hounsell) it would be very beneficial to have more direct information from the expert rather than just hearing about other projects.
2. Overall very well managed-it was good to have a booklet.
3. From this end of the event no, but before hand I had great trouble getting my head around what we were doing/ aiming to do.
4. Dai Hounsell began by talking about "looking over the fence" at other projects. I think that should be prominent in the workshop announcements etc.
5. Yes, I think projects should be grouped into initial/start-up projects and those that have progressed a year down the track.
6. Some (not all) didactic sessions from authoritative speakers.
7. Perhaps group the projects by discipline eg. Health sciences, arts etc. I enjoyed the focus on assessment however, and that may be lost if the above approach is taken.
8. Maintain the diversity of the day's program (eg. Project overviews, expert of Dai, question sessions). Also thought the pre-submitted questions was an excellent idea-efficient, and resulted in the generation of excellent discussion and sharing of knowledge.
9. Perhaps pre-organised presentations theoretically.
10. I don't think people would mind if the day extended a little either side-this would allow ten minutes each project including one or two questions (in the first session) and would mean it would not be necessary to be so strict on time and questions.
11. Clearer focus on issues to address, methodology and evaluation.
12. Two days could easily be well spent on longer coverage of all the issues raised today.
13. More in depth discussion amongst smaller groups with commonalities of project interests (but with diverse opinions and approaches.
14. Timing was good-not too long, atmosphere was comfortable and well managed-collegiate, thoughtful, value-adding.
15. I think there are some real links between the projects and it would be excellent to have had time/contexts to work through some of those links.
16. Perhaps some clear objectives for the forum eg. Project management issues and answers, or dissemination practice successes and failures.
17. Make it longer i.e. Two days for more depth.
18. Yes, please provide more opportunities for disseminating results.
19. Maybe a longer time for exchange
20. A workshop with four-six projects exploring their goals and problems. The aim of such a workshop would be to establishes collaborations and share good ideas.
21. The current structure and preparation worked well. Definitely need a facilitator to pull all the key points out of all projects and to guide discussion and challenge participants.

Any further comments?

1. Excellent forum for the opportunity to think/discuss/debate issues that you have been grappling with on you own.
2. Minor, but forward notice of dinner would have been nice so we could plan travel for this.
3. Thank you, I feel awake and fizzy.
4. I like this type of meeting, although I don't think it is a substitute for similar meetings within each discipline.
7. I got lots of great ideas and energy from the day. Thank you, I feel well supported by Carrick.
8. Thank you
9. Very well done. Congratulations to all involved.
10. Well done and thank you.
12. Extremely useful. To be able to have two of these over the life of a project (one to get input at the beginning from those who are advanced; one for advanced research to import ideas to the beginner) would be good.
13. Thank you for the opportunity to be amongst peers and to stimulate ideas concepts, approaches and feel part of a community of practice.
14. An invaluable opportunity to hare ideas and practices with like-minded academics with a commitment to improving learning and teaching through assessment.
16. Worthwhile and improves sector-wide collaboration and understandings
17. Wonderful-please do it again.
21. A great opportunity to establish new collaborations which we have done today. There may be benefit from short term discussion lists set up via Carrick to continue the discussion from today.