



Learning and Teaching Academic Standards for Science Consultation with the science community

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Learning and Teaching Academic Standards Project

The Australian Learning and Teaching Council has received funding from the Australian Government for this project.
The views expressed in this material do not necessarily reflect the views of the Australian Government.

An initiative of the Australian Government Department of Education, Employment and Workplace Relations

Outline

1. The LTAS project for Science
2. The Science Consultation Paper
3. Workshop: Discussion and harvest



1. The Learning and Teaching Academic Standards (LTAS) project



- The LTAS project was commissioned by the Australian Learning and Teaching Council (ALTC).
- The LTAS Project aims to ensure that each **discipline community** defines and takes responsibility for implementing a set of agreed **academic standards**.
- Core principles of the LTAS project:
 - academic autonomy
 - collegiality
 - peer review

Academic Standards as learning outcomes

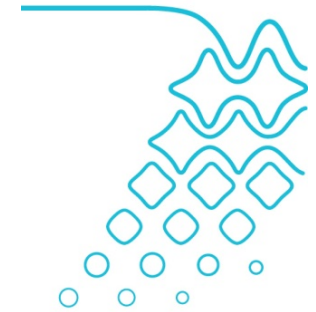
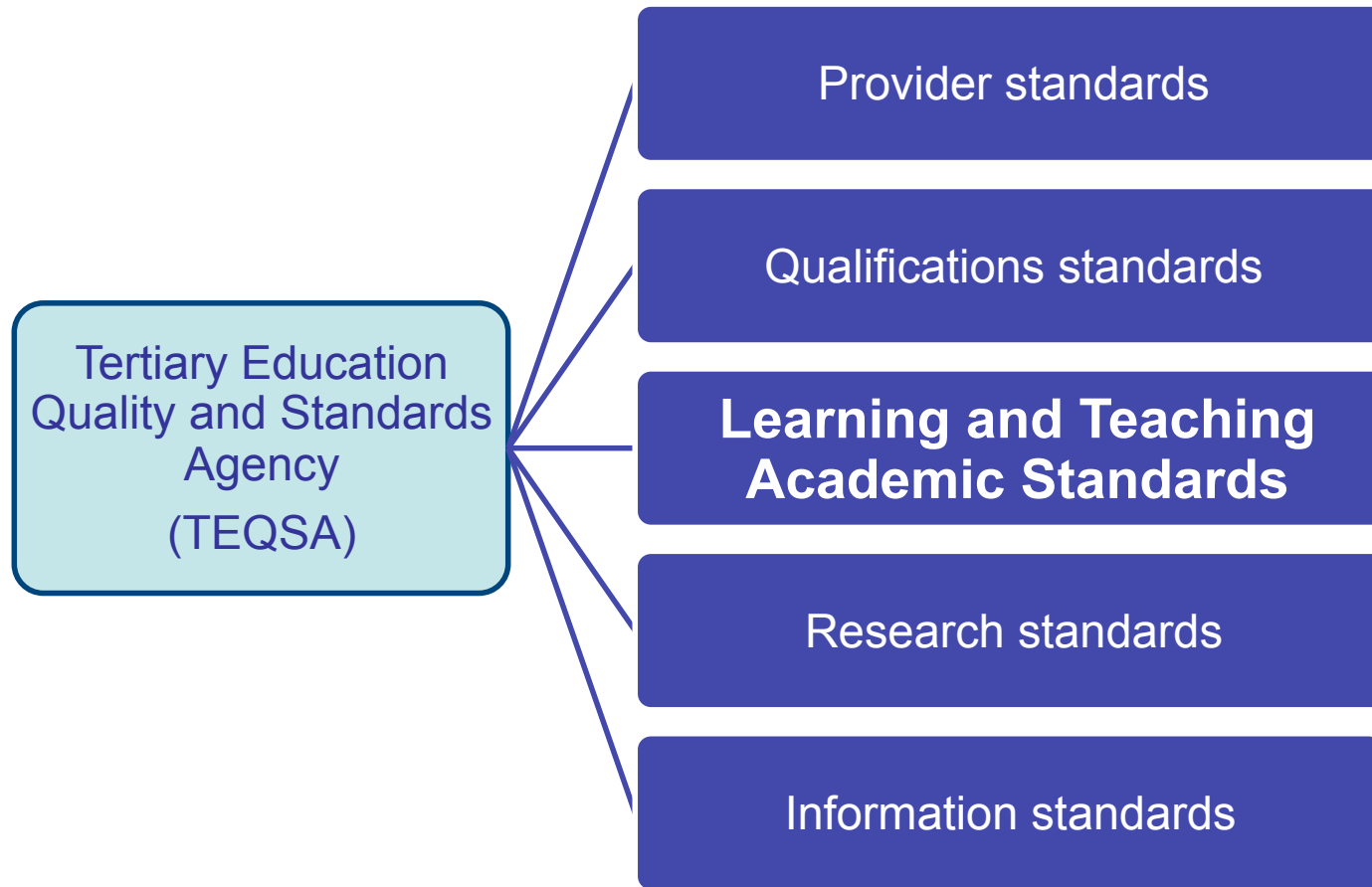


- In this project, academic standards are expressed as assessable **learning outcomes**.
- “Learning outcomes are clear statements of what a graduate is expected to know, understand and be able to do as a result of learning” (AQF definition).
- **Threshold Learning Outcomes** (TLOs) describe the capabilities of a pass-level graduate of a degree program. They represent minimum learning outcomes for graduates.

Why is this project timely?



- Global trends in quality assurance and accreditation of degrees (e.g. Tuning Europe, Tuning South America, Quality Assurance Agency)
- New federal government agenda to monitor and maintain academic standards (Tertiary Education Quality and Standards Agency - TEQSA)



The Science LTAS project



This project aims to identify and document an agreed set of Threshold Learning Outcome (TLO) statements for undergraduate degrees in the Science discipline.

- **The TLOs will describe the capabilities of ALL graduates of Australian science degree programs.**
- The TLOs will not describe a detailed curriculum.
- Institutions may choose to identify additional TLOs that reflect the distinctive character of their programs.
- Institutions may choose to set their pass standards above the level of the TLOs.

So why is this project exciting??

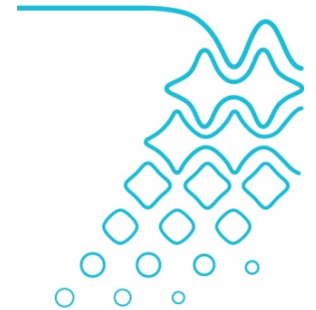
- Our opportunity to redefine or reinvigorate tertiary science education in Australia
- Stimulus for curriculum redesign or renewal
 - TLOs provide a framework for student achievement.
 - Learning outcomes place the focus on what the student does rather than what the teacher does.



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Who is involved?

- Discipline Scholars (Sue Jones and Brian Yates)
- Project Officer (Jo-Anne Kelder)
- Australian Council of Deans of Science



Who else is involved in Science?



- **Science Discipline Advisory Group**
 - four critical friends from physics, chemistry, maths and biology
 - provide initial feedback and expert advice
- **Science Discipline Reference Group**
 - broad representation of stakeholders- academic discipline experts, peak professional bodies, employers, students
 - provide input to the development of the Science TLOs
 - endorse the final Science TLOs
- **Working Parties for Chemistry and Mathematics**
 - adapt the Science TLOs to their disciplinary context
- **The Science discipline community – you!**

The project plan

- Develop TLOs for bachelor degrees in Science
- Working parties for Chemistry and Mathematics
 - demonstrate/test how the Science TLOs may be applied at the sub-discipline level
- The Honours or Masters degrees in Science
 - develop TLOs that differentiate between Honours or Masters and Bachelor degrees in Science
- Consult widely with the Australian Science community
- Final Science TLOs endorsed by the Australian Council of Deans of Science



Timeline

- 2010 July – December Initial consultation & development of TLOs ✓
- 2010 December Consultation Paper released ✓
- 2011 February– March Widespread consultation, feedback, and rewriting of TLOs
- 2011 April - June Final review and endorsement of the Science TLOs



Questions???



2. The Science Consultation Paper



The Draft Science Standards Statement contains:

- Nature and extent of science
- Graduate careers
- **Threshold Learning Outcome Statements**
- Notes on the Threshold Learning Outcome Statements

<http://www.altc.edu.au/standards/disciplines/science>

Threshold Learning Outcome Statements

	Upon completion of a Bachelor degree in science, graduates will be able to:
Ways of scientific thinking	<p>Understand ways of scientific thinking by:</p> <ol style="list-style-type: none"> 1.1 Demonstrating a broad knowledge of science, the creative endeavour involved in acquiring knowledge, and the contestable and testable nature of scientific knowledge 1.2 Demonstrating knowledge of the principles and concepts underlying at least one disciplinary area.
Discovery and Problem solving	<p>Investigate and solve straightforward problems by:</p> <ol style="list-style-type: none"> 2.1 Using recognised methods of science and appropriate practical techniques and tools 2.2 Formulating hypotheses, collecting valid and reliable data, and incorporating quantitative evidence into arguments 2.3 Synthesising and evaluating information from a range of sources, using a range of technologies.
Communication	<ol style="list-style-type: none"> 3.1 Communicate scientific results, information, or arguments, to a range of audiences, and for a range of purposes.
Personal and social responsibility	<p>Take personal and social responsibility by:</p> <ol style="list-style-type: none"> 4.1 Recognising the relevant ethical frameworks within which science is practised 4.2 Demonstrating a capacity for self-directed learning 4.3 Demonstrating a capacity for working responsibly and safely in both individual and team environments 4.4 Understanding, and being able to articulate, some aspects of the place and importance of science in the local and global community.



3. Workshop

- Group discussions and feedback to the project team



Discussion 1:

Are these draft TLO statements appropriate for science?



Consider and report back

- one key idea from each group
- other comments recorded in writing

Discussion 2:

Does each draft TLO describe a capability that can be measured, and student achievement assessed?



Consider and report back

- one key idea from each group
- other comments recorded in writing

Discussion 3:

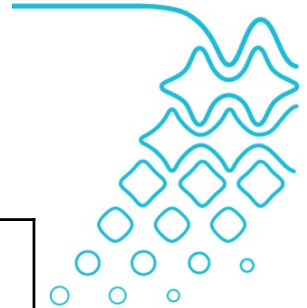
How could you see the Science Threshold Learning Outcomes used to improve undergraduate science programs?



Consider and report back

- one key idea from each group
- other comments recorded in writing

Engage and contribute (and encourage colleagues to do so)



Visit the project web page to access the Draft Science Standards Statement December 2010 consultation paper as well as current information on the project via the link:

<http://www.altc.edu.au/standards/disciplines/science>

Sign up to receive email alerts and project newsletters via the link:

<https://www.surveymonkey.com/s/8H9L3MH>

Complete the online survey via the link:

<https://www.surveymonkey.com/s/T5JK33D>

DEADLINE for email submissions and survey: 15 April 2011