



A Collaborative Evaluation of the Teaching of First Year Chemistry and Biology at the University of Melbourne and the University of Sydney

S. Franklin (USYD)

M. Peat (USYD)

D. Gleeson (UMELB)

A. V. George (USYD)

P. Tregloan (UMELB)

M. Devlin (UMELB)



Objectives of this benchmarking project

- Identify best practice
 - Establish process of benchmarking in a large Science Faculty
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Timing of this project

- Time of change in Universities
 - Greater accountability
 - Increasing student numbers
 - Funding pressures
 - Snap shot of current practice
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What is Benchmarking?

Process of measurement using an external standard of quality to measure internal and external tasks. It can also be viewed as a framework for a process of continuous improvement.

References:

- Zairi, M and Hutton, R (1995) 'Benchmarking: A process tool for quality improvement', *The TQM Magazine*, **7(3)**, 35-40.
- Stralser, S (1995) 'Benchmarking: The New Tool', *Planning for Higher Education*, **23**, 15-19.
- Weeks, P. (2000) 'Benchmarking in higher education: An Australian case study', *Innovations in Education and Training International* **37(1)**, 59-67.



How we did it

- Communication:
 - Face to face
 - E-mail
 - Tasks:
 - Fact gathering about own University, Faculty, First Year programs
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Different levels to inform process

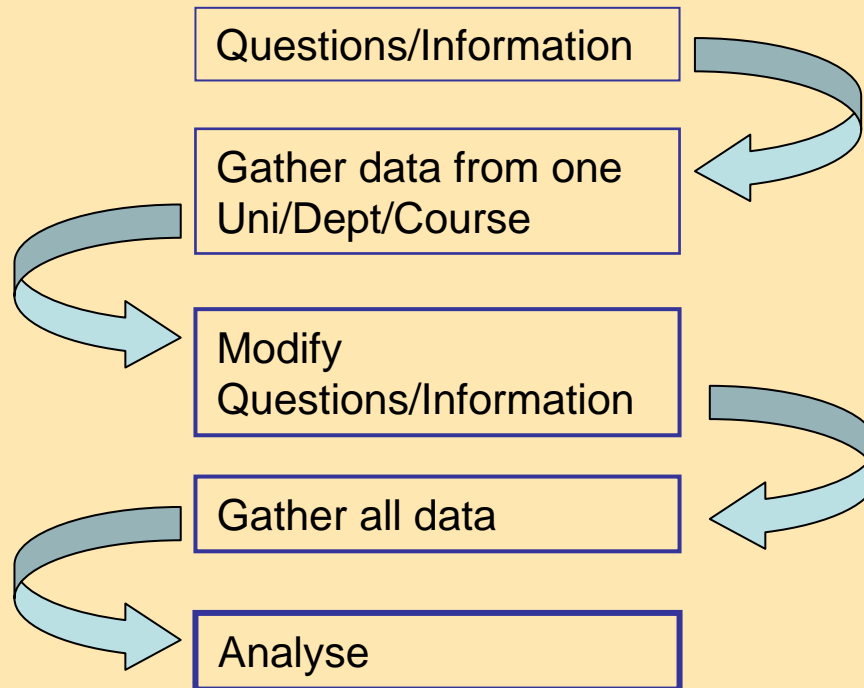


- University
- Faculty
- Department



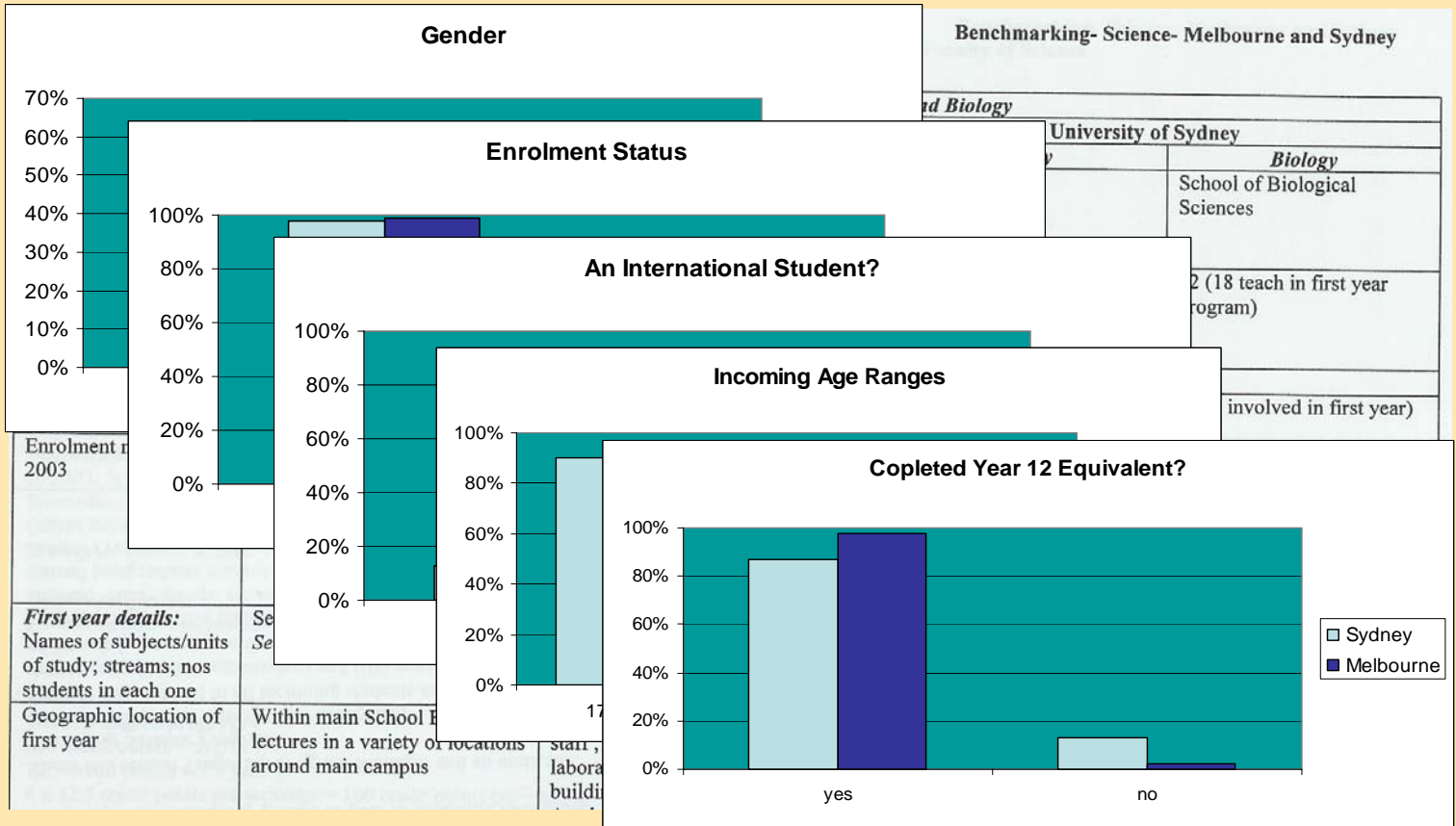


Mapping the information





What we found





One example - ChemCAL

- Modules with information, animations, questions, hints and explanations
- It forms part of a raft of resources
- It is available to all first year chemistry students
- It is not compulsory





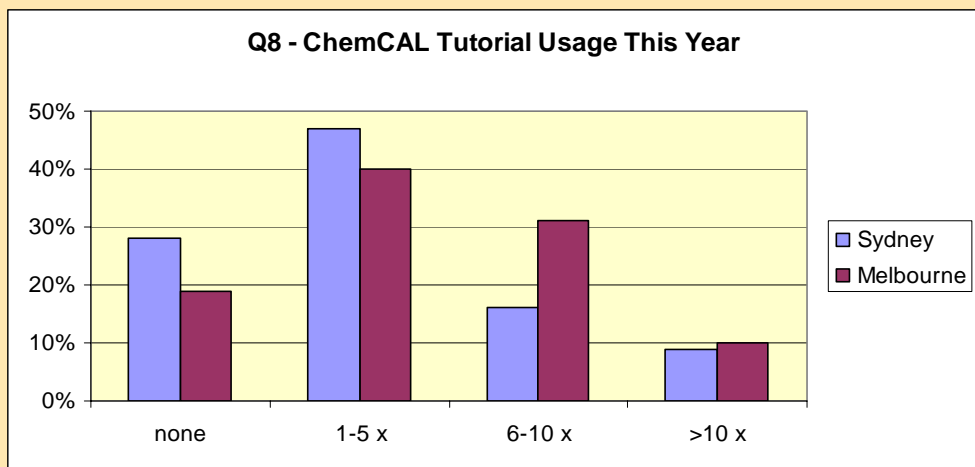
The screenshot displays a Microsoft Internet Explorer browser window showing the ChemCAL Online Home Page. The browser's address bar shows <http://chemical.chem.usyd.edu.au/index.html>. The page content includes a navigation menu with links such as [Stoichiometry](#), [Behaviour of Gases](#), [States of Matter](#), [Electrochemistry](#), and [Chemical Energy](#). A sidebar on the left provides introductory text and a direct link for comments.

Overlaid on this is another browser window showing the 'Absolute Temperature Scale' page. The address bar shows <http://chemical.chem.usyd.edu.au/S1GenChem/GasLaws/AbsTempScale.html>. The page title is 'Absolute Temperature Scale'. The content explains the absolute zero of temperature and defines the Kelvin scale. It includes the equation $T = \text{Absolute temperature in Kelvin} = (\text{temperature in } ^\circ\text{C}) + 273.15$ and the gas law equation $\frac{P_1}{T_1} = \frac{P_2}{T_2}$. A question asks for the normal boiling temperature of liquid nitrogen in Kelvin, with a hint: `Temperature in kelvin = temperature in Celsius degrees + 273`. The page also features interactive buttons for 'compress gas' and 'expand gas'.

At the bottom of the browser window, a copyright notice reads: 'These ChemCAL Online materials are for purposes associated with the teaching of chemistry courses provided by the School of Chemistry, The University of Sydney as set out in the licence with the publisher, The University of Melbourne. The materials and content may not be used or reproduced in any form for any other purpose.'



Students were asked how often they used ChemCAL (N=737, 460)



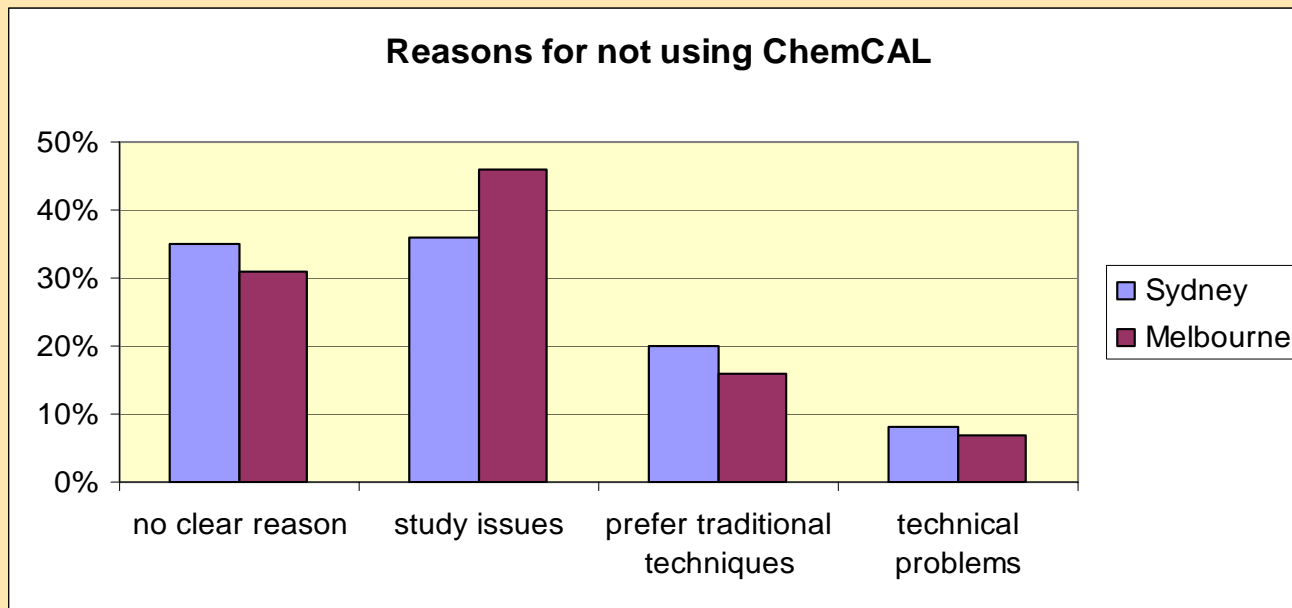
The majority of students use ChemCAL at least a little

Log data indicates a mix of steady use during the semester and cramming at just before exams

High level of engagement



Those that did not use ChemCAL were asked why



Study habits of the students at the two Universities appear to be very similar



Some of the differences

- Transition programs
 - Talented Students program
 - Web delivery platform
 - Staffing
 - Student study area
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Does it change anything

- Corporate inertia
 - Slow change only possible
 - Incentive to collaborate
 - Provides indication we are on the right track
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Conclusion

- Framework of what to benchmark necessary
 - Agreed timeframe to keep the project rolling
 - No substitute for face-to-face consultation
 - Those on site are likely to provide most accurate data
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