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

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Objectives of this benchmarking project

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

- Time of change in Universities
  - Greater accountability
  - Increasing student numbers
  - Funding pressures
- Snap shot of current practice
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:
How we did it

• Communication:
  • Face to face
  • E-mail

• Tasks:
  • Fact gathering about own University, Faculty, First Year programs
Different levels to inform process

- University
- Faculty
- Department
Mapping the information

1. Questions/Information
2. Gather data from one Uni/Dept/Course
3. Modify Questions/Information
4. Gather all data
5. Analyse
What we found

- Gender:
  - Female: 0%
  - Male: 10%
  
- Enrolment Status:
  - Full time: 0%
  - Part time: 100%

- An International Student?
  - Yes: 0%
  - No: 100%

- Incoming Age Ranges:
  - 17-20: 0%
  - 21-24: 40%
  - >24: 60%

- Completed Year 12 Equivalent?
  - Yes: 20%
  - No: 80%
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
Absolute Temperature Scale

There is an absolute zero of temperature at which atomic and molecular can lose no more energy by cooling.

This occurs at -273.15°C, so that an absolute temperature scale (the Kelvin scale) is defined:

\[ T = \text{Absolute temperature in Kelvin} = (\text{temperature in } °C) \text{ plus } 273.15 \]

The effect of a change in temperature on the pressure of a gas is given by:

\[ \frac{P_1}{T_1} = \frac{P_2}{T_2} \]

1. The normal boiling temperature of liquid nitrogen is -196°C.
What is this temperature in Kelvin? ______ K

Hint: Temperature in Kelvin = temperature in Celsius degrees + 273
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
Does it change anything

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