The Adelaide Experiment: Would you like an iPad with that?

Simon Pyke, Karin Barovich & Bob Hill
Faculty of Sciences
The University of Adelaide
• In 2011 the Faculty gave ~850 iPads to commencing Science students
• In 2012 & 2013, we repeated this (~800 iPads in each year)
• We also invested in >200 iPads for teaching staff
• Total cost about $1.67 million to date

Why did we do this?
Scientists are responsible for many things that make life great in the 21st Century,

BUT

the challenge to bring everyone up to a reasonable standard of living and to maintain that well into the future has barely been addressed.
We face genuinely global challenges in the future

- Biodiversity loss
- Population explosion
- Climate change
- Water security
- Food security
- Food security

Life Impact | The University of Adelaide
Education systems of the world must deliver people able to provide better solutions to these problems...

**Increased scientific literacy is critical**
So what did we do?

- We began redesigning our curriculum from first principles
- The starting point was to work out our research strengths and to focus on these in our teaching
- We changed our emphasis from student attraction to retention – this highlighted many problems
Enhanced Learning in First-year Science Project

- Discussion & debate within the Faculty gave rise to the “Ten Big Questions”
- These are socially relevant questions of big fundamental science that our staff specialise in.

- How did the Universe begin?
- How does the Earth work?
- What is life?
- How did life evolve on Earth?
- How do we unravel the causes of disease?
- Why does climate change?
- How can we feed the world sustainably?
- How can we reduce our reliance on fossil fuels?
- How will we conserve species diversity?
- Where will the nanoscience revolution take us?
The re-design of our curriculum was assisted significantly when a small window of opportunity allowed us to move to a new and fully interactive hardware option:

the Apple iPad

These were *given to students with no strings attached* and no expectations about how they were used.
Why did we commit to the iPad?

- **PORTABILITY** - students will carry it with them
- **CONNECTIVITY** - great for internet access (we bought 3G enabled iPads)
- **CREATIVITY** - lots of relevant apps for education
- **ACCESSIBILITY** - allows for e-books to be purchased
- **DESIRABILITY** - staff were easy to persuade to be involved (it was the shiny new device at the time...)

*Life Impact | The University of Adelaide*
What were the major challenges?

- Staff uptake of the project
- Management of the hardware, including reliability
- Finding alternatives to hard copy text books
- Student mindset
- Some anti-Apple sentiment
- The ponderous University system
- IT support
- Equity issues – not every student in every Level 1 class would have an iPad
What were the alternatives?

- Choose a different hardware solution
- Students pay for the iPad
- The strategy as outlined, but without a hardware solution
What have we achieved?

- A clearer understanding of the relevance of the curriculum
- Teaching as a partnership
- Removal of dependence on hard copy text books
- Students with instant and universal access to email, the internet and all on-line sources of information
What didn’t we achieve?

- A move away from face-to-face teaching for the majority of our students, because that isn’t our intention
How well has it worked?

- First year enrolments have increased significantly
- Retention has improved
- Student reaction has varied from neutral to very strongly positive, with little negative feedback

BUT...

- This is the start of a long process of continual improvement and there is still a long way to go...
The evidence (1): Enrolments

Commencing Student Enrolment Trends (2008-2012)

- Total UG Load
- B.Sc
- B.Sc (Advanced)
The evidence (1): Enrolments

Commencing Student Enrolment Trends (2008-2012)

- B.Sc
- B.Sc (Advanced)
The evidence (1): Enrolments

Students Commencing with raw ATAR ≥ 95

Commencing Year

Students Enrolled (Headcount)

- B.Science
- B.Science (Advanced)
## The evidence (2): Retention

<table>
<thead>
<tr>
<th>Retention of commencing cohort within...</th>
<th>2010 to 2011</th>
<th>2011 to 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>...their original program</td>
<td>72.5%</td>
<td>72.8%</td>
</tr>
<tr>
<td>...the Faculty of Sciences</td>
<td>78.7%</td>
<td>81.0%</td>
</tr>
<tr>
<td>...the University of Adelaide</td>
<td>84.2%</td>
<td>88.0%</td>
</tr>
</tbody>
</table>
The evidence (3): ‘In class’ data

SCIENCE 1100 ‘Principles & Practice of Science I’

The following graphs represent data collected in class.

2011; n=125 valid responses; 86% response rate
2012; n=182 valid responses; 73% response rate

In each case results are expressed as a percentage of valid responses received.
The Adelaide Experiment: Would you like an iPad with that?

How many e-texts have you downloaded to your iPad?

- 0
- 5
- 10
- 15
- 20
- 25
- 30
- 35%

- 2011
- 2012

Life Impact | The University of Adelaide
The Adelaide Experiment: Would you like an iPad with that?

**The iPad has helped me to be more engaged with learning.**

- **Strongly Agree**
- **Agree**
- **Neither Agree nor Disagree**
- **Disagree**
- **Strongly Disagree**

2011 and 2012 survey results.
The Adelaide Experiment: Would you like an iPad with that?

I participate in interactive/collaborative classroom tasks with my iPad.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree
- Not applicable

Life Impact | The University of Adelaide
The Adelaide Experiment: Would you like an iPad with that?

**Having an iPad has motivated me to learn.**

- **Strongly Agree**
- **Agree**
- **Neither Agree nor Disagree**
- **Disagree**
- **Strongly Disagree**
- **Not applicable**

![Bar chart showing responses to the question](image-url)
The mobility of the iPad has improved my study habits.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree
- Not applicable

2011 vs 2012
The Adelaide Experiment: Would you like an iPad with that?

I use the iPad for study outside of class.

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree
- Not applicable

2011 vs 2012
I think of the iPad as an essential part of my learning 'tool kit'.
The evidence (4): Teacher & Course Experience

Teacher & Course Experience data comparing 2010 results (pre-iPad) with 2011 results (post-iPad).
Q: How would you rate the effectiveness of this person as a university teacher?
Q: Overall, I am satisfied with the quality of this course

![Bar chart showing percentage of courses surveyed for 2010 (n = 23) and 2011 (n = 30) across different percentage ranges. The chart demonstrates the distribution of satisfaction levels.]

- 31-40%: 2010 (1), 2011 (2)
- 41-50%: 2010 (1), 2011 (2)
- 51-60%: 2010 (1), 2011 (3)
- 61-70%: 2010 (4), 2011 (5)
- 71-80%: 2010 (10), 2011 (7)
- 81-90%: 2010 (5), 2011 (9)
- 91-100%: 2010 (5), 2011 (5)
Q: I received adequate feedback on my work
Lessons learned?

• The device is just a device...

“It’s the Pedagogy, Stupid”
[ elearnmag.acm.org/featured.cfm?aid=1999656 ]

• “Measure twice, cut once…”

There have been major improvements in both our approach to teaching and the content we deliver.
“For the first time we are preparing learners for a future we cannot clearly describe.”

David Warlick
The Landmark Project
The Adelaide Experiment: Would you like an iPad with that?

e-Science

ISSUE 1 | MAY 2012

SOMETHING OUT OF NOTHING
Metal-organic frameworks and the nanoscience revolution

NEUTRINOS
The key to understanding our universe

CONSERVING MARINE BIODIVERSITY
Under changing climate conditions

EMU OIL
A role for natural medicines in the fight against gastrointestinal disease

ISSUE 2 | JULY 2012

FORENSIC EARTH SCIENCE
Getting the dirt on crime

FOOD SECURITY
How can we feed the world sustainably?

THE BIOLOGY OF CHOCOLATE ADDICTION
Why junk food is so hard to resist

HEAT FROM THE EARTH
A clean and abundant energy source
The Adelaide Experiment: Would you like an iPad with that?

- Links with the Ten Big Questions as a way to teach the relevance of Science.
- Available on the web (through browser) and iPad/Android (powered by Oomph).
- The first issue, which was launched in May this year, has had more than 6,000 downloads. The 3rd issue is just out.

http://creativecommons.org/licenses/by/4.0/