WIL in Science

A national project to develop work-integrated learning in Faculties of Science

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Grattan Institute's Andrew Norton says science graduates struggle more than others to find their first job.
Science graduates have diverse careers

Over 60% of working B.Sc. graduates are not employed directly in Science.

- Directly in Science: 28%
- Not working: 25%
- ‘General’: 17%
- Management: 11%
- IT: 7%
- Education: 6%
- Marketing: 5%
- Finance: 3%

Census 2011: B Sc grads + hno
Palmer et al, 2016ABS
Outcomes vary with degrees

- Bachelor of Science: 161597 graduates, 25.2% working as science professional, 57.0% otherwise employed, 14.7% not working
- Bachelor of Biological Science: 25056 graduates, 27.1% working as science professional, 54.7% otherwise employed, 14.4% not working
- Bachelor of Biomedical Science: 12426 graduates, 27.2% working as science professional, 37.4% otherwise employed, 6.2% not working
- Bachelor of Forensic Science: 692 graduates, 16.2% working as science professional, 58.7% otherwise employed, 18.8% not working
- Bachelor of Zoology and Animal Science: 2487 graduates, 27.9% working as science professional, 60.2% otherwise employed, 2.3% not working
- Bachelor of Environmental Science: 16342 graduates, 14.0% working as science professional, 56.3% otherwise employed, 28.2% not working
- Bachelor of Fisheries and Aquaculture: 863 graduates, 13.7% working as science professional, 77.6% otherwise employed, 7.1% not working

Overall, 78% of graduates are working in science-related fields, and 38% are working as science professionals.
What should a science degree do?

I’ve done particle physics so I’m set…

…but I don’t need a researcher
Employability means that students acquire the skills, understandings and personal attributes that make them more likely to secure employment and be successful in their chosen occupations to the benefit of themselves, the workforce, the community and the economy. 

Mantz Yorke 2009

WIL is aimed at improving the employability of graduates by giving them valuable practical experience which is directly related to courses being studied at university. WIL also improves the transition from university to work and productivity outcomes for the employer and the economy.

National Strategy on Work Integrated Learning in University Education, 2015
Work integrated learning occurs at various levels across a range of tasks that are **authentic** (the task resembles those required in professional life) or **proximal** (the setting resembles professional contexts).

...work-integrated learning is an umbrella term used for a range of approaches and strategies that integrate theory with the practice of work within a purposefully designed curriculum.

_National Strategy on WIL, 2015_

- What counts as WIL?
- Scaffolding?
- Core requirement?
- Scale?
WIL participation in Science

% UG students involved in WIL activities

<table>
<thead>
<tr>
<th>Type of WIL activity</th>
<th>Natural and Physical Sciences</th>
<th>Agriculture Environmental and Related Studies</th>
<th>Information Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry Projects</td>
<td>14.5</td>
<td>26.9</td>
<td>72.9</td>
</tr>
<tr>
<td>Short term placements and internships (less than 6 weeks duration)</td>
<td>5.5</td>
<td>37.4</td>
<td>7.0</td>
</tr>
<tr>
<td>Medium term placements and internships (6-12 weeks duration)</td>
<td>2.8</td>
<td>19.5</td>
<td>15.2</td>
</tr>
<tr>
<td>Long term placements and internships (more than 12 weeks duration)</td>
<td>2.6</td>
<td>17.5</td>
<td>12.2</td>
</tr>
</tbody>
</table>

Work Integrated Learning in STEM in Australian Universities (Edwards et al, 2015)
‘Good WIL’

- is clearly **linked** to theoretical aspects of courses ... creates ‘ah-ha’ moment
- has well articulated **expectations** of both students and industry partners;
- has clear **induction** processes at the beginning
- has facilitated opportunities for **reflection** on experiences at the end - for both students and industry;
- has well established **processes** for logistics and support of students and industry
- has **support** from leadership and dedication from academic staff.

*Work Integrated Learning in STEM in Australian Universities (Edwards et al, 2015)*
Building WIL is complex

Tolson and Mitchell (2105) after: Patrick, C. J. et. al. (2014). Leading WIL: a distributed leadership approach to enhance work integrated learning. Office for Learning and Teaching
WIL in Science Leadership Project

- National leadership network
- Build capacity: resources and mentoring
- Action to foster WIL: lighthouse projects
WIL in Science network

Finding out about WIL: challenges, options, other views

WIL needs: partnership, leadership resourcing

WIL in Science Forum

Help: ideas, examples, community, energy

Taking action: planning, framework, audit

Faculty Planning workshops

‘New ideas about possible collaborations’

‘Look at ‘the finer detail that lies ahead’

‘Motivated me to take the next steps’

More of … ‘how to…’
Growing WIL as course renewal

WIL mapping:
where is WIL in the curriculum?

Planning for WIL:
Where and what sort of WIL? Optional, embedded
Preparation, reflection, partners, engagement, systems

Implementation
Building WIL activities, assessment, processes

Evaluation
Outcomes: student, staff, industry experience
Graduate employability
Working with Faculties

Faculties are not the same...

‘What is WIL?’

Mandated placement for all students

➢ ACDS network reaches all science faculties
➢ Engage Faculties from their context
Exemplars: lighthouse projects

- **Intention**: what would success look like?
- **Definition**: what counts?
- **Mapping**: where is it?
- **Possibilities/SWOT?**

**Ideas:**
- Hidden WIL
- Scaffolding

**Assessment**
- Delivery
- Quality

**Ideas:**
- Industry Partners
- Students as partners
- Using existing student work
- Using honours
- Entrepreneurship/start-ups

**Systems**: management
**Capability**: specialists and course teams
**Engagement**: stakeholders

**Ideas:**
- Limits to growth
- Orienting teachers
- Co-teaching WIL
Lighthouse Projects

Setting up Faculty WIL programs
Faculty level WIL: UTas
Finding WIL in multiple disciplines: WSU

Learning from others
WIL projects in science classrooms: Monash
Uni-wide WIL: Macquarie

Developing alternative approaches to WIL
WIL from existing employment: UQ
WIL for Honours: Monash

Extending WIL and building capacity for the future
Universal placement: UTS
Building capability: Deakin

Darren Flinders Flamborough Lighthouse, East Yorkshire, Creative Commons
Successful WIL in science

OLT grant: Aug 2016 – Aug 2018

- Grow network activity
- Peer mentoring
- Curate existing resources
- Case studies
- WIL in Science guide
- Student & recent graduates
ACDS: WIL in Science Projects

Thankyou

WIL in Science project teams
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Dr Jo-Ann Chuck, WSU
Dr Rowan Brookes, Monash
A/Prof Susan Rowland & Prof Peter Adams, UQ
A/Prof Peter Meier, UTS
Prof Malcolm Campbell, Deakin

Successful WIL in Science project team
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