AN AUSTRALIAN DOCTORATE FOR THE 21ST CENTURY

Insights from the ACOLA Review Process

Helene Marsh, James Cook University
Would the Minister release the report?
ACOLA Research Training Review

- Expert Working Group – members of 4 academies
- 85 submissions + 6 public forums + forums with ACGR and DVCs-R+ 84 interviews
• broader financing issues relating to research in Higher Education

• ensuring Australia has a high quality research training system
ACOLA Review – three pillars

HDR training produces high quality researchers capable of succeeding in different sectors

The Person

HDR training contributes to Australia’s future prosperity and wellbeing

The Nation

How to structure the research training system to achieve the above

The System
Australia’s research candidates are diverse

James: 23
Australia, English literature

Relia: 35, Indonesia Veterinary Science

Louisa: 40, Torres Strait Islander Education

Anna: 28, Australia Physiotherapy

Yasif: 44, Pakistan Engineering
Huge increase in HDR numbers since 2000

Most candidates studying doctorates and proportion increasing

Source: Department of Education and Training 2015
Enrolment data show international candidates are increasingly important.
| Broad Field of Education                                      | % International |
|***************************************************************|
| Engineering & related technologies                          | 53              |
| Information Technology                                      | 49              |
| Agriculture Environmental & related studies                 | 43              |
| Management & Commerce                                       | 40              |
| Natural & Physical Sciences                                 | 37              |
| Architecture and building                                   | 28              |
| Education                                                   | 21              |
| Health                                                      | 20              |
| Society & Culture                                           | 19              |
| Creative Arts                                               | 10              |

International candidates much more important in some disciplines

Source: Department of Education and Training 2015
2/3 of candidates are over 30

Source: Adapted from Dept of Education and Training 2013
Participation ratios of domestic doctoral candidates from non-traditional backgrounds uneven

Indigenous participation low and declining

Source: Adapted from Dept of Education and Training 2013 by ALCOLA 2016

[Graph showing participation ratios over time]
Employment status good but are our doctoral graduates under-utilised?

Source: ABS census data 2011
Don’t do a doctorate for the $$$$.

Median salary graduates in F-T employment 3 years post graduation

Source: Adapted from survey and custom data requested by ACOLA from Graduate Careers Australia
Most doctoral graduates did not report occupation as tertiary teachers in 2011 (Australian census)

<table>
<thead>
<tr>
<th>Occupation type</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tertiary Education Teachers</td>
<td>25</td>
</tr>
<tr>
<td>Natural and Physical Science Professionals</td>
<td>17</td>
</tr>
<tr>
<td>Professionals not further defined</td>
<td>7</td>
</tr>
<tr>
<td>Social and Welfare Professionals</td>
<td>5</td>
</tr>
<tr>
<td>Medical Practitioners</td>
<td>4</td>
</tr>
<tr>
<td>Information and Organisation Professionals</td>
<td>4</td>
</tr>
<tr>
<td>Engineering Professionals</td>
<td>3</td>
</tr>
<tr>
<td>Business Administration Managers</td>
<td>3</td>
</tr>
<tr>
<td>All other occupations</td>
<td>32</td>
</tr>
</tbody>
</table>
Several indicators demonstrate poor knowledge transfer between university research & industry in Australia.
Present situation (left boxes) and vision

- Internationally competitive
- Candidate-centred
- Evidence-based
- Industry*-engaged??

*inclusive definition

My scores based on experience of ACOLA process
Increase international competitiveness with new pathway degree

- Current arrangements limit internationally recognised entry pathways to research education
- Bologna cycles 3+ 2+ 3
- Australia 4+ 3...
People who made submissions to ACOLA supported research training coursework Masters degree
International benchmarking at disciplinary level could improve international competitiveness

To be truly world class Australian PhDs in Marine Science need to include advanced training in skills to manage big data
Increase candidate focus: be upfront about career prospects

Thanks academia, soon I will join a generation of jobless PhDs
Deregulation of Government scholarships from 2017 designed to enable universities to better align candidate needs with candidature realities

- Stipend
- RTS
- Actual
Improve transferable skills training

Increase emphasis on career development

What doors can open beyond academia?
Need accessible evidence of transferable skills
Professionalise supervision

Good supervision is the most important contributor to HDR success

“cloning” & treating doctoral candidates as cheap labour are not professional practices
Change supervisor culture

My supervisor does not want me to go to skills workshops.
but there are always silverbacks.............
Increase number of and support for Indigenous doctoral candidates

- Indigenous researchers have much to offer
- Targets and increased weighting needed to acknowledge the value of Aboriginal and Torres Strait Islander researchers to universities
- Incentives also needed to increase participation
Universities must do better

By ensuring:

- positive university experience
- welcoming and supportive environment
- culturally appropriate supervisor training
Improve industry-engagement

- A higher proportion of doctoral education could be:
  - focused on externally-defined research problem
  - take place in external settings; or
  - involve an non-academic supervisor

- Funding needed to drive change

- Not just a university problem
Innovation: There’s no action without industry at the table

DENISE CUTHBERT  THE AUSTRALIAN  APRIL 20, 2016  12:00AM

Without industry, government and the sector will have the same old conversation. Illustration: Tom Jellett.
Canadian research candidate ~15 times more likely to do internship than Australian

**Australia**
- AMSI intern
  - ~100 placements p.a.
- iPREQ 60 p.a in WA
- Advance Qld 7 in 2015
- Watt Review recommended 700 X 6-month placements per year

**Canada (Mitacs)**
- ~3,200 internships in 2014-15
- Target: 10,000 internships p.a. by 2020
- 79% SMEs
Mitacs basic building block

Academic + industry collaborator + student + proposal + referee + 6 weeks =

$C15 k for 4 months internship
Mitacs interns span disciplines (N=3194)

<table>
<thead>
<tr>
<th>Discipline</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business</td>
<td>6%</td>
</tr>
<tr>
<td>Computer Science</td>
<td>14%</td>
</tr>
<tr>
<td>Earth Sciences</td>
<td>10%</td>
</tr>
<tr>
<td>Engineering</td>
<td>36%</td>
</tr>
<tr>
<td>Life Sciences</td>
<td>21%</td>
</tr>
<tr>
<td>Mathematical/Physical Sciences</td>
<td>7%</td>
</tr>
<tr>
<td>Social Sciences/Humanities/Arts</td>
<td>6%</td>
</tr>
</tbody>
</table>

Most interns feel extra employable as a result of their internship.

Source: Laurence Meadows Mitacs
HOW DO CANADIAN COMPANIES DRIVE INNOVATION?
Mitacs Accelerate Survey Results from 200+ Businesses

92% of companies we surveyed would recommend Accelerate. Here’s why.

New Product Development
- 66% said project results have been or will be commercialized
- 36% had a new or enhanced product developed

Skills & Talent
- 30% hired at least one of their interns
- 47% engaged in new collaboration(s) with the academic sector
- 82% continued collaboration with the academic supervisor
Improve evidence-base

- Impossible to:
  - estimate return from ~ $1 billion government investment in research education
  - know how best to improve system

- Longitudinal data sets on HDR graduate outcomes:
  - valuable information to drive performance improvements
  - enable prospective HDR candidates to make informed choices
An Australian doctorate for the 21\textsuperscript{st} century

- Internationally-competitive
- Candidate-centred
- Evidence-based
- Industry-engaged
Our HDR candidates 5 years post-graduation

James: 28
Postdoc
Oxford

Relia: 40
Faculty
Bogor
Agricultural University

Louisa: 45,
Director Indigenous Education
Qld government

Anna: 33
Start up medical device company, Melbourne

Yasif: 49
Solar energy engineer, multinational
Sydney
Doctoral Education: an investment in human capital for the knowledge economy