Restoring opportunities for early to mid-career researchers: Career GAP

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Abstract: The number of researchers in Australia and other countries has risen sharply compared with the early 1980’s, indicating that the role of researchers as the core human capital in the establishment of a knowledge-based economy is expanding. In this context, countries around the world regard the development and retention of excellent researchers as the centerpiece of their science and technology promotion policies and are implementing a variety of initiatives suited to their own circumstances and challenges.

In order to ensure the development and retention of human resources capable of supporting Australia’s intellectual foundation, it is important to provide young researchers, who are the key of this challenge, with a variety of research opportunities suited to their aptitudes. However, careers of many young researchers in Australia are in a holding position. Many of them are in their second or third postdoctoral position with low salary, low status, limited or no job security and uncertain career prospects. The postdoctoral period appears to turn into a “holding pattern” of “normal employment” for scientists who can not find a permanent position. This is frustrating for them, but it is also of institutional and national concern.

In this paper I will compare opportunities for early to mid-career researchers across the higher education sector in Australia, and internationally. I will explore possible career paths, sources of funding and national policies. Also I will look at the possible consequences for Australia if this issue is not addressed in the near future.

Introduction
The quality of research produced by scientists hinges on the ability of research institutions to strike a balance between short-term contracts, which enable fresh ideas and circulation of knowledge, and permanent positions, to ensure the continuity of long-term quality research. However, postdoctoral and mid-career researchers on short-term contracts, which usually become a “long” term employment option, often face a lack of clear career path. This not only discourages talented young scientists but can also become detrimental to research as a whole.

From many studies that have been done on this topic arises the question: Can the career path for young researchers be improved? The critical issues related to this question are career development, security and recognition. The other aspect of this problem is defining the responsibilities and roles of government funding agencies and universities in planning and developing careers for talented researchers.
Important Issues Addressed in the Paper
This study examines recent trends in working conditions for academic staff especially for mid-career researchers in Australia and internationally. It begins with an overview of the academic career followed by present challenges and international trends.

The main issues raised in this study include the following:
- Funding policies and the need for establishing a full-cost of research model in Australia
- Lack of career planning and development at the university level
- The casualization of the academic workforce
- International trends.

Universities play a distinctive role as educators of future researchers, and existing research staff employed in universities are integral to this process. There is no doubt that Australian universities are faced with significant challenges in training, recruiting and retaining high quality research graduates and staff, particularly in the context of an ageing academic workforce. Without adequate career progression and recognition of the value of the work conducted by university researchers, these challenges will become even more difficult to overcome. Australia’s research efforts may suffer through a decrease in basic research output and our ability to produce research graduates capable of working in applied, experimental and strategic research endeavours may be compromised.

Establishing an Academic Research Career: Prospects and Problems
A promising researcher needs to pass a number of milestones in their career path to become established in an academic career. Laudel and Gläser (2006) distinguish four stages of an academic’s career:
- an “apprentice” learns to conduct research while working under the directions of others
- a “colleague” conducts independent research and contributes to a scientific community’s knowledge
- a “master” is a colleague who additionally acts as a mentor for apprentices, and
- a “member of the elite” additionally shapes the direction of the knowledge production in the wider scientific community.

In each of these phases the researcher is tested through various challenges, some of which are listed below:
- It would be expected that the developing researcher would obtain a doctoral degree as a formal recognition of their training.
- Following their doctoral studies, the researcher will need to obtain a research position which in most cases will be a postdoctoral position, lecturer or assistant professor. Those positions are most of the time temporary and can vary in duration depending on the field of research. Obtaining an on-going academic position can be more difficult than obtaining funding for research.
- Having obtained an academic position, most of the academics will need to moderate competing demands of teaching load, in order to build research focus and stay competitive through their research track record.
- At the mid-point in an academic career (Level C), the teaching and research academic will find their time and commitment to research threatened again by increased faculty administrative responsibilities. At this point it is expected that researcher independently, as a chief investigator, seeks larger amounts of competitive research funding from external sources.
• The fully-fledged academic researcher must establish their own research directions at a level which demands greater or longer-term financial support, and from which they can begin to mentor a new generation of early career researchers. This step can be difficult to achieve; it requires perseverance and resilience in the face of failure.

Not surprisingly, through this series of critical career points, many researchers who could potentially make a contribution to the advancement of knowledge are lost to active research. Those who survive the tough nature of the research world are no doubt highly motivated, resilient and resourceful.

**Academic Career Prospects in Australia**

Most early to mid academic career positions, which are research only or research and teaching, are defined by universities as level A, B and C. The vast majority of those positions, especially level A and B, are fixed term contracts. For example, at the ANU as a leading research institution in Australia, 89 percent of level A employees and 60 percent of level B are on fixed term contracts. One source of funding for early to mid career researchers is publicly funded fellowship schemes and the other source is the University’s funds and grants.

The two major research fellowship schemes operating in Australia are funded by government agencies: the Australian Research Council (ARC) and the National Health and Medical Research Council (NHMRC). Those fellowships are very competitive and success rates vary depending on the scheme but they are not greater then 20%.

Although the ARC and NHMRC provide direct support for research career development through fellowships there are only limited places for the ones who want to join the boat. There is, on the one hand, an expectation that a significant proportion of academics will conduct quality research and, on the other, limits on the funds to do so. Inside universities there is a growing pressure on young researchers to apply for funding and fellowships as a way of proving and establishing their ability to attract external funding. However, there is little or no support for what happens next when fellowship ends. This uncertainty in funding and employment security is a major problem which discourages talented people from staying in research.

However, the new Labor Government is giving some hope to mid-career researchers under a new “Future Fellowships Program” which offers 1,000 four-year Fellowships over a five-year period (2009-2013) for mid-career researchers valued at $140,000 per year, with an associated $50,000 project and infrastructure grant to go to the institution for the duration of the Fellowship. One of the requirements of submission will be institutional plans for integration of the fellow into ongoing activities of the organization at the end of the fellowship.

This is very good initiative and resembles in some sense the UK model of funding outstanding researchers. This will give an opportunity for the research organization to think ahead before employing fellows about what kind of career it can offer at the end of the fellowship. In some sense it gives a greater career view for researchers and the possibility to negotiate terms of employment.

**Academic Career Challenges in Australia**
One of the major problems in establishing an academic career, as earlier mentioned, is lack of security in employment. In 1994, an Evaluation and Investigation Program (EIP, DEETYA) study, entitled “The Casualisation of Research Postgraduate Employment” (Collins and Bulbeck, 1994), showed that the proportion of contract research employees in universities in Australia had increased from 28% in 1980-84 to 62% in 1991-93. The situation did not improve in the following years due to pressures on the universities’ budgets. While tenure as a concept may be less often thought about outside academia, within a university it is considered as a “grand prize” which brings job security and freedom to work without fear of dismissal or other reprisal. Connected to this are the social implications of the trend towards contract employment; stress associated with the insecure nature of such work, for example the inability to plan for the future, have children, buy a home, or provide ongoing support for dependents (Collins et al., 1994).

The data in Figure 1 shows the full time equivalent (FTE) employees working at Australia’s universities from 1995 to 2006. It also shows the FTE employees classified as research only staff over the same period and the proportion of total FTE accounted for by research-only staff. In 2006 Australian universities employed a total of 80,956 FTE staff, an increase of 14.2% over 1995. In 2006, 11,114 FTE staff were classified as research-only, representing an increase of 46.3% over 1995 levels. As a consequence, the proportion of total staff classified as research-only rose from 10.7% in 1995 to 13.7% in 2006.

Figure 1: Australian universities Full Time Equivalent (FTE) 1995-2005

Figure 2 provides comparative data for full time and fractional staff (excluding casual staff), research-only staff and all staff in relation to the percentage (%) of staff who in 2006 were:
- classified as general staff;
- under 50 years of age;

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• appointed at Level D or above for academic staff or HEW7 or above for general staff; and
• had tenure or continuing employment.

Figure 2 shows that if you were employed as a research only member of staff at an Australian university in 2006, compared to all university staff you were, on average:
• younger;
• more likely to be classified as an academic;
• more likely employed at a lower level than that either of academic or general staff; and
• be far less likely to have tenure (continuing employment).

What is of concern is that the data shows that only about one in ten (11%) of research-only staff have continuing, secure employment. In other words, approximately 90% of research-only staff are employed on limited term contracts. This situation is a major concern particularly given the capacity of Australian universities to maintain the stock of intellectual knowledge and experience in the context of the aging of the current university workforce.

Research by Professor Graham Hugo (2005) indicates that in 2001 the academic workforce was, on average, older than the general workforce and older than a number of other comparable professions. The implications of the aging academic workforce are clear - in the next decade, a considerable number of the current academic workforce retire and will need to be replaced.

Figure 2: Selected characteristics for all research-only and all staff 2006

![Chart 2](image_url)
In 2006, the Productivity Commission undertook a survey of working conditions and job satisfaction at Australian universities as a part of Productivity Commission Innovation Review. Participants in the review raised several issues regarding difficulties in obtaining competitive research grants and fellowships, extensive use of fixed term contracts as a preferable way of employment, lower morale towards the end of a contract, reducing the productivity of the individual, increased non-research workload, and significant researcher ‘dead time’ as researchers wait to hear about the success or failure of grant applications. For some graduates and current researchers this uncertainty detracts significantly from the attractiveness of research as a career option.

Following in the same pattern is to ask how attractive is an academic career and can we maintain or improve the quality of academic staff in the university sector in Australia. A comprehensive survey about changes in academic work in Australia was done by Anderson, Johnson and Saha (2002). Anderson et al. surveyed academics about the attractiveness of an academic career through a variety of on-line questions and interviews. The study showed that academic job attractiveness, job satisfaction, and possibilities for promotion decreased over the years. With university funds struggling to keep in the positive and with a long road to a permanent position it is not surprising that many young academics choose to leave academic work in a trade-off for job security and possible better pay. The implication for the Australian university sector on the longer run with an aging work force is how to accommodate the implied loss of experience and expertise. In the November 2001 issue of The Times Higher Education Supplement, Maslen (2001) observed that ‘Australian universities face a staffing crisis over the next five to ten years as one in every eight academics reaches retiring age’. What makes this trend a crisis, according to Maslen (2001), is that these academics will probably not be replaced with conventional new academic recruits to tenurable positions, but rather by fixed-term appointments or casuals. This pattern highlights a range of issues relating to ageing and succession in the academic profession.

**International Trends**

Concerns about academic careers and prospects as well as retention of talented researchers have become growing at an international level. In the United States, economic, political, demographic, social and policy pressures have forced universities to begin dramatic changes in the terms and conditions on which they employ staff members. Among these changes are increasing employment of non-tenure track faculty, modification of tenure policies, the institution of post-tenure review, and an increasing consciousness about individual tenure decisions. Since 1993, the total number of faculty in the USA has increased by more than 35% (Table 1). However this was driven almost entirely by the growing use of contingent academic staff.

<table>
<thead>
<tr>
<th>Employment Status</th>
<th>1993</th>
<th>2003</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time tenured or tenure track</td>
<td>392,210</td>
<td>411,031</td>
<td>4.8%</td>
</tr>
<tr>
<td>Full-time non-tenure track</td>
<td>146,274</td>
<td>219,388</td>
<td>50.0%</td>
</tr>
<tr>
<td>Part-time/adjunct</td>
<td>358,313</td>
<td>543,137</td>
<td>51.6%</td>
</tr>
<tr>
<td>Total</td>
<td>866,797</td>
<td>1,173,556</td>
<td>35.4%</td>
</tr>
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*Source: US Department of Education, National Center for Education Statistics*  
Table 1: Number of academic staff by employment status, USA, 1993 and 2003
Employment in the UK higher education sector is highly casualised, with nearly half of all academic staff working on fixed-term contracts. In 1995-96, 57% of UK academics held permanent positions. By 2002-03 that proportion fell to 55%. In 1995-96, nearly 15,000 UK academics were employed on a part-time basis, about 12% of the total. By 2002-03, that number had risen to more than 25,000 or nearly 18% of the total number of academic staff. The overuse of fixed term contracts in the UK, however, may be coming to an end. Key research institutions in the UK have undertaken a coordinated and system-wide approach to addressing career management issues for contract researchers, based on shared responsibility between universities and research funding bodies. Many of the UK prestigious fellowships have a requirement for the host universities to offer fellows a continuing appointment after five to eight years of fellowship.

While the overall number of academic staff in the UK has grown, the rapid increase in student enrolment over the past three decades has not been matched with an increase in academic staff. One immediate consequence of this has been elevated levels of occupational stress reported by academics. In a survey of academic staff in 2004 (Kinman et al.), half of the respondents reported borderline levels of psychological distress. In addition to larger classes, one principal factor identified as adding to job-related stress is a growing pressure to bring in research funding and to perform successfully in the Research Assessment Exercise (RAE) (Kinman et al.).

Among the new wave of reforms in academic careers in institutions in the European Union is the Karolinska Institute (KI) in Stockholm, Sweden, which inaugurated a new career structure last year. The Karolinska Institute modeled its career development structure with bases on institutions in the United States. Its career structure consists of two tracks: one for researchers and one for teachers, with possible intersections for both. KI encourages movement between the two tracks, and both can lead to open-ended professorships (Figure 3). This new structure emphasizes transparency and evaluation.
Figure 3: Teaching and Research Careers at Karolinska University, Sweden
**Possible Career Structure for Researchers Holding Fellowships**

- **Funding Agency**
  - ARC, NHMRC

- **Decision**
  - Declaration of Structural development

- **Proposal**
  - Permanent position after fellowship ends

<table>
<thead>
<tr>
<th>Applicant</th>
<th>Negotiations</th>
<th>Host Institution</th>
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After 3 years revision

<table>
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<tr>
<th>Reporter</th>
<th>Evaluation</th>
<th>Veto ?</th>
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<tbody>
<tr>
<td>Funding Agency</td>
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<table>
<thead>
<tr>
<th>Researcher Holding Fellowship</th>
<th>Tenure Track Offer</th>
<th>Tenure after fellowship ends</th>
<th>Host Institution</th>
</tr>
</thead>
</table>

Figure 4: Possible career structure for mid-career researchers holding external fellowships

**Possible Solutions for Australia**

One of the possible solutions for Australia is first implementing full cost of research funding schemes by government funding councils, which will release some of the budget pressures from core university funds and allow universities greater flexibility in regards to creation of new positions.

Australian funding agencies and universities should work jointly on career management issues, at least for academics holding prestigious fellowships. One of the possible pathways for mid-career researchers who are holding fellowships is presented in Figure 5, which provides schematics on a possible career path to a permanent position for researchers holding external fellowships. In this example, an applicant applies for fellowships and negotiates terms of employment with the hosting institution. The hosting institution submits a declaration of structural development for the applicant which will possibly lead, if finances permit, to an open-ended contract or permanency after the end of the fellowship. In the middle of the fellowship (approximately after 3 years) the fellow submits a report to the funding agency which evaluates the candidate’s performance up to date and makes a recommendation to the institution. The host institution offers tenure track to the applicant with conversion to tenure after the end of the fellowship. The hosting institution can raise a veto for the permanent position to the funding agency if there are financial problems or some state of misconduct has occurred.
Universities can create their own career planning management and introducing tenure track options. A strict set of transparent criteria on what is needed for achieving tenure should be introduced for the candidates. Staff members who are predominantly teaching should not be disadvantaged with this, and they should be promoted accordingly.

**Conclusions**

So why should research institutions take a risk of employing someone permanently when they only have funding for a limited period? Because of the way this form of employment impacts the quality and continuity of research and teaching. Short-term contracts often lead to unfinished, unpublished research and do not leave room for long-term projects. In the long run, institutions could well benefit from increasing the number of permanent positions to ensure continuity in their projects. This remains an unsolved problem that ought to be addressed at a government level.

There is no straightforward answer to the problem of employment of research scientists and there is no one size fits all. Looking towards industry, it is striking that the commercial world has developed ways of dealing with the uncertainty of funding, and not only by using contractors. Making tentative predictions of future income enables industry to plan recruitment accordingly (Nature Materials, 2004).

Evidence on graduate outcomes indicates that academic work has become less attractive than other occupations in terms of working conditions. In addition, statistical evidence shows Australian universities are faced with a rapidly aging academic workforce. In that sense, Australia needs to give urgent attention to nurturing, rewarding and securing career paths for talented early-career to mid-career researchers.
References


