Managing for the Ideal Research Environment

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Abstract

This article addresses two questions relating to research:

1) What is the best environment in which to carry out research?

2) What is the best way to manage employment in order to maintain this environment?

It focuses on research management in UK higher education, but attempts to generalise beyond a specifically national context. The article discusses how existing practice has evolved and highlights several problems that have arisen. It draws on the experiences of researchers at the University of Sheffield to explore the consequences of current practice and to make recommendations for research management in general.

Research and the Knowledge Economy

Classical economic theory identifies the key factors in a market economy as being land, labour and capital. Implicit within this model of the economy is the assumption that the search for information is "frictionless and cost free, allowing for identical information for all" (Wigand, Picot, & Reichwald 1997). Increasingly in post-industrial economies however, the roles of knowledge and information are being emphasized. In 1998, for example, the UK's Secretary of State for Trade and Industry informed his party conference that he has "become a revolutionary… [in] the revolution of the information age…" (Mandelson 1998).

The recognition by the UK's Labour government of the significance of the 'Knowledge Economy' has been demonstrated in recent years by a plethora of reports, many of which emphasise the importance of research to the economy.

The Sainsbury Review of the UK Government's Science and Innovation Policies (2007) discusses ways to exploit investment in research and encourages a "move into knowledge intensive goods and services and out of low value-added ones" (p3). A move of this sort, based on the appropriate management of knowledge and information would put innovation at the heart of the economy and would play a part in helping it to remain adaptable in a rapidly changing global environment.

The Leitch Review of Skills (2006) argues that such adaptability should be an underlying principle in the development of the UK's skills base, while the Warry Report (Research Council Economic Impact Group 2006, 6) explicitly links adaptability to research. "Research excellence… underpins our ability to create, absorb and deploy new ideas rapidly."

According to the Warry Report, around 80 per cent of the UK's Science Budget is delivered through eight Research Councils, to Universities and Research Institutes in the UK. Presumably therefore, the conditions under which university researchers work have a significant impact on the nation's research output.

Full-time researchers at UK universities are referred to by a variety of names, including Research Assistants, Research Associates, and Post-docs. Currently, almost all are on fixed term contracts. Recent changes in employment law designed to reduce the use of fixed term contracts have prompted some initiatives, but these have been aimed at increasing the security of employment. They have not given thought to the conditions under which research can best be carried out. This article begins to address this shortcoming by exploring two questions:

1) What is the best environment in which to carry out research?

2) What is the best way to manage employment in order to maintain this environment?

Evidence

All the points raised in this document are based on experiences of researchers at the University of Sheffield. Some illustrative anecdotes have been included at appropriate points in the discussion below. All information was volunteered by staff at the University, and all contributions have been anonymised.

Because it is the norm for researchers in the UK to be employed on fixed term contracts, many of the contributors have worked at two or more universities. The experiences described therefore, were not limited to Sheffield University.

Evidence for the report comes from the following sources:

- Published Reports,
- A focus group carried out by Sheffield University's Graduate Research Office in April 2006,
- Issues raised by Researchers who are members of Sheffield University & College Union (SUCU).
- Researchers who are members of the Sheffield University Researchers Working Group (SURWG – see below), and some associated Principal Investigators (PIs).

The SURWG was founded by researchers in SUCU, and by representatives of researchers' societies from several departments. It comprises researchers from Medicine & Biomedical Sciences, Molecular Biology and Biotechnology, Physics, Architecture, Computing Science, Education, Politics and Information Studies. A focus group took place in March 2008, and further discussion took place on a Bulletin Board hosted on the University of Sheffield's Web site. A draft of this paper was

circulated amongst participants in both exercises and revised in the light of their comments.

Principal Investigators are project fund-holders. They are usually permanent academics and are responsible for the management of researchers employed on the project.

A changed research environment

From researchers to research managers

The proportion of 17-30 year olds in UK Higher Education has risen from around 14-15 per cent in the 1970s (Trowe 1988) to 43 per cent in 2006 (Dept for children, schools and families, 2007). Not only has this impacted on the role of the university lecturer, it has had a profound impact on that of the university researcher.

Unfortunately for both students and lecturers, the rise in student numbers was not matched by an equivalent rise in the number of lecturers. The traditional ideal of a research-led university was that students should be taught by academics who were actively involved in research. However, regardless of what, in real terms, was a decline in the number of lecturing staff, the expectation remained that they should continue to carry out high quality research, despite being required to spend more time attracting the funds to pay for it and more time teaching.

Increasingly therefore, the only way that academics could remain involved in research was by proxy. They would bid for project funding, then, if successful, employ a researcher from project funds. As a result, their role changed. Without it being acknowledge, permanent academics shifted gradually from being active researchers to being research managers and fund administrators.

From research assistants to researchers

Historically in the UK, a research post was seen as being a stepping stone towards a lectureship. Newly qualified PhD students would consolidate their experience by taking a post-doctoral research assistantship (post-doc). As such, they would assist academics who were already experienced researchers and could hone their own research skills.

However, the changes discussed above which resulted in academics appointing proxies to carry out their research, resulted in a marked rise in temporary researcher posts. In the short term this was good for research. Grant holders with research posts to offer found that, alongside applicants with new PhDs, they had applicants with several years' experience. It was less good for researchers however. The presumed career path, from post-doc to lecturer, became increasingly unavailable. Consequently, there are now far more researchers chasing fewer lecturing vacancies. At the University of Sheffield for example, there are four research staff for every five lecturers (Table 1). Over 75 per cent of these are on pay scales below that of lecturer.

Academic (Teaching &Research)	**Teaching Only**	**Researcher** (on fixed contract)	**Researcher** (not on fixed contract)
1157	152	953	105

Table 1: Numbers of teaching and research staff at Sheffield University, November 2008. (Figures from Sheffield University Human Resources)

Many of these researchers have now completed several research contracts and have accrued considerable experience (in some cases, over twenty years). Despite this, research funding and research management in universities operate according to the perception that researchers are still in transition from PhD to lectureship and that their primary function is to assist permanent academics in their research.

Invisible researchers

From 1995 to 2002, around 94% of researchers at UK universities were on fixed term contracts. In 2002, European Community legislation was introduced in order to reduce the use of such contracts. Despite this legislation, in 2005-6, 84.7% of researchers (around 30,000) were still on fixed term contracts (University and College Union, 2007). Currently at Sheffield, the figure is 90% (Table 1).

Despite the high numbers of researchers, many with considerable experience, the UK's most recent Research Assessment Exercise (RAE) stipulated that the majority of contract researchers should be excluded from the exercise. RAE 2008 guidelines stated that "Research assistants… are employed to carry out another individual's research programme rather than as independent investigators in their own right" (RAE 2008, ¶70). Publications by most full-time researchers in the UK were therefore excluded from the RAE unless they also bore the name of an academic on a permanent contract (to whom they could be credited).

The UK's Research Assessment Exercise (RAE) is one of the most influential assessments of British Higher Education establishments. Since its inception in 1986 however, it has been subject to considerable discussion (eg, Williams, 1998, Elton, 2000). Elton highlighted some of its unintended consequences, but did not consider its effect on most of the UK's full-time researchers. Despite perceived problems with the exercise however, it has attracted interest in other countries (eg, Bourke, 1997).

The perception that researchers on fixed term contracts are adjuncts to a project rather than being researchers in their own right is not limited to the UK. According to Hobson, Jones & Deane (2005, 360) for example, the role of the research assistant in Australia, "is well established as one involved in research not of the research

assistant's conception." There, just as in the UK, university research assistants are seen as associate professionals "who perform complex technical and administrative… functions… in support of professionals."

Similarly, the contribution of many researchers in the USA is also often overlooked. In 1999, Cavanaugh, writing in the Johns Hopkins Magazine, noted that:
"… elements of the postdoctoral fellowship system nationally have gone seriously awry. In some labs, postdocs are little more than semi-anonymous research temps or glorified technicians. Although many top university researchers work hard to provide a learning experience that will help fellows in future careers, other senior scientists are taking advantage of what some postdocs and administrators call a highly educated, cheap labor force."

Acknowledging experience

The view of researchers as adjuncts to the work of permanent academics has had profound effects on the management of research in the UK. In 2008 for example, the Research Councils UK (RCUK) drew up a Concordat that was intended to improve career prospects for contract researchers. In listing research managers however, the Concordat failed to include contract researchers themselves. This is despite the fact that many played a significant part in the inception and planning of the project that employs them, and are responsible for its day to day running.

The extent to which contract researchers contribute to grant proposals goes largely unrecognized. Until 2006, the UK Research Councils excluded applications from employees on contract. As a result, many applications went through an intermediary (see Anecdote 1, below).

RCUK now accepts proposals from researchers on fixed term contracts but, when reviewing projects, they take into account the track record that the project proposer has in managing research. As discussed above, the track record of researchers is often overlooked.

It was noted above that, because of time constraints due to increased teaching and administration, permanent academic staff find it increasingly difficult to engage directly in research. This, together with the fact that it is hard for researchers on contract to get their experience acknowledged, could give rise to problems in future. Mauthner & Doucet (2008) refer to divisions of labour within teams of qualitative social science researchers and highlight a number of associated risks. There is, for instance, a growing risk that research projects will be proposed by academics who have not been actively involved in research for some time, and may have less idea of what is practical and possible than would a full time researcher.

In Anecdote 1, for example, Researcher A drafted her second proposal while an employee of Sheffield University. On her departure therefore, Z (had he been less principled) could have revised it and submitted it himself. Since he had not been actively involved in A's earlier project, his revisions would have been based solely on a hypothetical assessment of the research difficulties to be overcome. Unlike A, he had no direct experience of the research setting.

Anecdote 1

Researcher A began working with Z when she joined a research team at Sheffield University. They became friends and, when Z got appointed to a lectureship, A went to see him with an idea for a research proposal. Because of Research Council rules prior to 2006, it was not possible for A to submit the proposal herself, so they agreed that it should be submitted in Z's name.

The proposal was successful. Z's career benefited and A got two years further employment. However, A resented the fact that her department gave her no credit for the project proposal; and relations between her and Z began to deteriorate. Z, as A's manager, made suggestions which A regarded as inappropriate and intrusive. She was, she felt, capable of managing the project herself. The proposal had been her idea and had arisen from work that she had done previously for a far more "hands-off" manager (now retired). Furthermore, she had more research experience than Z.

A's contract is due to end shortly. She has developed follow-up project proposal but was informed by her head of department that she could not be named as co-investigator if the proposal was submitted. She has since approached an academic at another university, who is keen to work with her on the proposal.

Funding patterns and project management

The pattern of research funding creates another serious barrier to the management of research. Currently, funding (particularly in older universities) tends to follow a model of one researcher to one project. The great advantage of this is that it is simple to administer. Furthermore, when funding streams are uncertain, there are risks inherent in employing someone for longer than the period of the funding. However, as a report of the House of Commons Science and Technology Committee (2002) concludes "…universities have deflected the risk onto the researchers; this bad management has added to the plight of contract researchers. In this respect, universities have failed their research workforce and the UK's science base."

As the report notes, this deflection of risk to researchers is not in the interests of either researcher or research. Not only is the situation stressful for researchers on

contract, but the need to look for work elsewhere distracts their attention from the projects on which they are engaged. Indeed, if the experiences of Bristol University prove to be typical, the risk may be less than it is perceived to be. “Concerns among research leaders that open contracts would lead to stagnation of research through low staff turnover have proved misplaced. Levels of turnover are similar to before. Bristol’s new employment practices have also led to more active management of research staff and career development dialogue with those coming towards the end of their contract.” (UKHERD 2006, 8)

The practice of linking employment of researchers to one particular project also tends to lead to discrimination against more experienced (and therefore more expensive) researchers.

Perhaps though, the most significant disadvantage of the practice is that it is it does not reflect the way in which researchers work. Although they are often employed on only one project, they are frequently contributing to more than one at any given time. Participants in the SURWG focus group felt that the ideal situation was one in which researchers each had their own main project which they could carry forward, but where they could also contribute to other projects, and seek contributions for their own project.

This pattern is appropriate to project research work, which is rarely linear. There are occasions when a project requires little input and the researchers involved are free to contribute to other projects. At other times, the schedule is hectic, and researchers may benefit from assistance.

Opportunities to reflect: opportunities to discuss

A further advantage of such an arrangement is that it would generate a range of collaborative partnerships that would promote communication amongst researchers. The role of communication in innovation was famously discussed by Feyerabend (1987), and it was clearly seen as important by members of the SURWG focus group. They recognized the need for personal space in which to engage in reflection, but they also valued opportunities in which to exchange ideas with colleagues in an informal setting. This need for a combination of solitude and gregariousness is described by Montuori and Purser (1995) in their discussion of the myth of the "lone genius". They argue that creativity "takes place in groups, organizations and societies… and … can be sparked by interactions." (p105)

As an example, they cite Nat Wyeth "…a leading scientist at DuPont and inventor of, among other things, the plastic soda pop bottle, *[who]* has discussed the importance both of contacts with colleagues and isolation. He emphasizes that at different stages in the process of invention, he chooses either to work alone or to meet colleagues who can help him get out of a rut and provide him with different perspectives on the problem he is working on." (p93)

Project ownership and project membership

Where researchers are employed on fixed term contracts, it is common practice to offer funding to bridge the gaps between research contracts. This is certainly valuable, but perhaps a more sustainable practice would be to establish bodies that help with the administration of research funding. Rather than linking a researcher to a specific fund, such bodies would administer resources so that one fund may pay several researchers, and one researcher may be paid from several funds. This clearly complicates administration of the financial resources, but it helps to optimise

the human resources. It would also help relieve project managers of an administrative role to which they may not be suited, thereby helping to avoid problems such as those described in Anecdote 2.

Anecdote 2

When B's contract came to end, money was found for a three month extension. By chance, shortly before the extension was due to begin, B had an appointment with the finance office. When he attended, he was surprised to discover that they knew nothing of his extension and had posted his unemployment documents. Unfortunately, they had several addresses for him on their database and had sent the letter to one that B had left seven years previously.

B's Principal Investigator was extremely apologetic and assumed that the error was hers. B wasn't sure whether it was her fault or HR's. He had a good working relationship with his PI and admired her research; but he acknowledged that she wasn't always a good administrator. However, she went to considerable pains to chase HR and ensured that B got paid at the end of the month.

It wasn't the first time that B had been in such a position and his previous PI had been less conscientious. At another university, B was working part-time on two projects. The PI for one came to him at the end of the month and told him that she had forgotten to inform Human Resources (HR) that B was working for her. It was too late to ensure that he received payment that month, but the PI promised to sort the matter out as soon as possible. At the end of the next month, B's PI was on holiday. When B checked with HR he learned that they remained unaware that he was working for his PI, and for a second month he received half pay.

Other universities have research units which attract funding from a range of sources. An example of such a unit is the Centre for Education and Inclusion Research (CEIR) at Sheffield Hallam University. CEIR has gained a national reputation for its research activities. It employs seventeen staff, eleven of whom are researchers; and because its researchers each work on a portfolio of projects, the Centre has enough flexibility to take on a wide variety of projects, including some within and around Sheffield. Some of these projects only fund a few months research at a time, but they help to supplement CEIR's income and they help to facilitate the kind of knowledge transfer advocated in the Warry Report.

Such research centres are, according to Hazelkorn (2005, p88) "becoming the staple research organisation within higher education, responding to economic, societal needs and interests, and calls for greater collaboration with external partners."

An arrangement of this sort has further advantages. From the institution's perspective, it makes a pool of research expertise and experience available for consultation. From the point of view of the researcher, it implicitly recognizes that they have transferable research skills as well as specific expertise. It also provides scope for career development, with more experienced researchers having the opportunity to develop and lead projects; and it helps to ensure that, in the event of researchers leaving or falling ill, the projects with which they have been involved can continue. Problems of the sort described in Anecdote 3 are therefore less likely because fewer projects will rely wholly on one person.

Anecdote 3

X successfully applied for a UK research council grant. The project called for specialist skills, and an applicant with the required skills was employed.

Unfortunately, though she had appropriate technical skills, she lacked research experience. She organised her time and resources poorly, and needed more supervision than X was able to give. She left before the end of the contract. Much of the work she claimed to have completed had been done inadequately or not at all leaving X with a lot of loose ends to tie up.

Relations with Principal Investigators

For employees to be successful in whatever field, they need good working relations with their colleagues: especially their line managers. However, because of the perception that researchers are adjuncts to academics, researchers on fixed contracts are particularly dependent on good relations with the Principal Investigators (PIs) who manage their projects and administer the funds. In order to become a PI, it is usually necessary for an academic to demonstrate experience in research and project management. There is no requirement however, for administrative experience. As is clear from Anecdote 2, this can have serious consequences for researchers.

Inequality

Hobson, Jones & Deane (p365) note that, in Australia, "the funded researcher's grant success and subsequent capacity to employ a research assistant is an act of self-liberation constituting and constituted in another's subordinate position – the research assistant's."

The same problematic relationship exists in UK Higher Education. Anecdotes 1 and 4 describe circumstances in which difficulties arose because of conflicts of interest between Contract Researchers and Principal Investigators. The behaviour of *W*, the PI described in Anecdote 4 was clearly unethical and probably represents an

extreme example. *Z*, the PI in Anecdote 1, was neither unprincipled nor unethical. He was however, the beneficiary of an unfair system. It could be argued that he took his responsibilities seriously but was prevented from managing *A* effectively because of her intransigence. *A* however, was probably well able to manage herself: a fact which appeared to go unrecognized within her department.

Anecdote 4

D, a fixed-term contract researcher had worked successfully with W, a Professor and former head of Department, for a number of years. D gradually became more involved in the writing of grant proposals and, after around 5 years, began work on a grant proposal for a UK Research Council. D did most of the writing, while W helped in other ways such as talking to the Research Council and proof reading the material.

The day before the agreed submission date D gave a final copy of the proposal to W's secretary. On the copy, he was named as co-investigator. Two days later, D discovered that his name had been removed and that the proposal had been submitted in W's name alone.

The dispute that followed resulted in the proposal being withdrawn. It created an atmosphere of mistrust, which led to considerable strain, causing D to suffer several years of stress-induced ill-health.

D eventually became PI on a number of successful project proposals. W remained in a position of influence. According to D, he has continued to prevent researchers from becoming co-investigators, even when they have made significant contributions to grant proposals.

A sense of belonging

Contract Researchers have varying experiences of induction. Those who took part in the Graduate Research Office focus group reported experiences ranging from no induction whatsoever to a very well organised and structured programme. It was generally felt though, that a starter pack would be of value, as would some form of mentoring system.

Where there is a good working relationship between Principal Investigators and their researchers, it can be highly productive. However, though most of the researchers consulted in the preparation of this report clearly felt loyalty towards their Principal Investigators, few felt loyalty towards Sheffield University. The perception was that they worked for their Principal Investigator, not the University. This view was reinforced by the fact that many were excluded from staff meetings within their departments, and from email lists on which departmental news and information were circulated.

Such a situation presents a number of risks. Researchers are likely to feel isolated and, on occasion (eg, Anecdote 4) may be exploited. Projects too are at risk. If relationships between Principal Investigators and researchers break down and the researcher's commitment is to the PI rather than to the department or University, he or she is likely to concentrate on seeking work elsewhere, and may take potentially lucrative project ideas with them (as in Anecdote 1).

Recognition

The perception that research staff are post-doctoral and en route to becoming academics is, as has been discussed, an anachronistic view based on an outdated perception of higher education. Unfortunately however, it is the view that underpins

the Research Assessment Exercise. As a result of the RAE ignoring the work of researchers, it increases the chance that their contribution to their departments will go acknowledged.

It not unreasonable that university departments should be subject to evaluation. However, the activities evaluated by the RAE represent only a small proportion of what a successful department should be doing. A list of activities to be performed by the 'ideal' university department may include:

- research;
- teaching;
- dissemination of research findings through academic publications;
- knowledge transfer through other channels;
- generation of research funding;
- administration.

At one time it may have been possible for academic staff to perform each of these activities successfully. The growing pressures on academic staff however, make it increasingly difficult for them to carry out all of the activities equally well. Unfortunately, the most widely recognized route for demonstrating excellence is through the Research Assessment Exercise. Often, an academic's most significant contribution to his or her department is in ways other than the publication of refereed articles. However, these contributions are not valued by the RAE. Frequently therefore, academics are obliged to demonstrate their activity by listing papers where the principal author was a researcher on a fixed term contract.

Some of the University of Sheffield's RAE returns were studied in the preparation of this article. There are many instances in which researchers have contributed to four

or more publications – often as principal author. Indeed, one researcher contributed to twelve articles returned for the 2008 RAE.

These publications however, are selected to demonstrate the research outputs of permanent academics. Researchers on fixed term contracts generally have formal say in which of their publications are submitted for the RAE. Consequently, their best work may be excluded. There is no official mechanism which allows them to demonstrate excellence. Not only is this discouraging for researchers, it also deprives departmental managers of a tool for recognizing and rewarding good work.

Although individual universities can do little to reform the assessment of UK Higher Education, it would be useful to academics and researchers alike if they maintained electronic repositories of publications. In addition to providing useful reference tools, they would also make it possible for researchers to demonstrate the level of their contribution to their department's research output.

Summary

This article attempts to explore two questions relating to research:

1) What is the best environment in which to carry out research?

2) What is the best way to manage employment in order to maintain this environment?

It began with a description of the current working conditions of researchers in UK universities. This was to highlight many of the ways in which the current environment is not conducive to research. It then introduced suggestions made by the participating researchers and Principal Investigators in response to the two questions. The answers arrived at are summarised below.

The best environment for research will, unsurprisingly, vary with discipline. However, key components are summarised below:

1. *Opportunities to reflect: opportunities to discuss*
    - *Communications* – opportunities to engage in planned and unplanned exchanges with colleagues from a range of disciplines promotes the inception and development of ideas;
    - *Personal space* – research relies on a periods of discussion and periods of reflection, so ideally, there need to be places of privacy as well as exchange;
    - *Variety* – access to and involvement in a range of projects helps to develop research skills, to maintain flexibility of thought, and to promote communication.

2. *Project ownership and project membership*
    - *Ownership* – Involvement in several projects is important, but so too is the opportunity to play a significant part in the management of a principal project;
    - *Appropriate security* – a sense of belonging to an institution helps to encourage loyalty to that institution and to its aims, and concentrates a researcher's focus on achieving those aims, rather than seeking employment elsewhere;
    - *Appropriate insecurity* – requiring researchers to attract the funding needed to keep themselves in employment, and to play a key role in managing projects and funds, ensures that they are fully committed to their research, and to maintaining its originality and validity;
    - *Supervision and mentoring* – a team that comprises researchers with a range of experiences provides an environment in which fresh insights can be effectively directed by experience.

Suitable management of researchers within an ideal environment would ensure the right combination of recognition and reward, and would allow researchers the possibility of greater autonomy.

Many of the problems experienced by researchers need to be tackled at a national level. There are however, actions that individual Universities could take to alleviate some of the problems. Suggestions fall broadly into two categories:

1. *Recognition of status and acknowledgement of experience*
    - Comprehensive programmes of induction would help to increase researchers' awareness of their role within the university that employs them;
    - Where appropriate, a shift in terminology would emphasize the fact that some researchers aspire to having a career in research and that employers do not see it as merely as a transition phase that follows the completion of a PhD. In the UK for instance, this would lead to researchers being given titles that reflected their experience as independent researchers, rather than being labelled 'Post-doc's', 'Assistants' or 'Associates';
    - The establishment of a central repository of publications written by University staff would facilitate dissemination, and would highlight the contribution of researchers to the University's outputs;

2. *Funding patterns and project management*
    - Targets could be set to promote an increase in the number of researchers on fixed term contract being registered as Principal Investigators or Co-Investigators (or their equivalent) on projects;
    - Bridging funds would help to finance researchers whose funding is likely to resume within a known period of time;

- The establishment of interdisciplinary “research consultancy centres”, with financial administration would allow individual researchers to be funded from several sources and to contribute to a range of projects;
- The use of interdisciplinary “research consultancy centres” would provide a pool of talent to work with academics in related departments;
- Project managers (eg, Principal Investigators in the UK) who employ researchers could be provided with management training;
- Project managers could receive administrative support to ensure that contract renewals and terminations are appropriately handled.

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