

Review of literature relating to competency frameworks for researchers

Summary

This review builds on the work of an initial literature survey conducted by Dr Anne Lee at the University of Surrey, which was commissioned in March 2009, in order to inform the creation of a researcher development framework. Where the initial paper considered skills, attributes and competences using definitions of research and the role of researchers as its basis, this review considered frameworks and their development more specifically.

There is substantial literature on defining competences and competencies as well as on the development of frameworks for effective usage in the workplace. However, much of the public literature pertaining to frameworks in higher education is relatively recent and is often related to 'harder' skills (managing people and resources, dissemination etc.) as well as 'pay and rations' rather than professional development – albeit recommended that they are used for the latter.

This distinction illustrates the two approaches: behaviour-based and task-based – in other words, the distinction between 'competency' and 'competence'.

Full frameworks themselves were not as difficult to find as initially assumed – particularly in higher education. In the corporate sector, however, it proved more challenging to find more than executive summaries, although this review benefits from insight from one major employer's framework.

Through the discussion of the differing theories, as well as the differences in language used between theories, the review demonstrates that the purpose and intended practical usage of the proposed framework need to be clearly defined. This allows for the development of the framework to follow an appropriate path, or to take a 'best of both worlds' approach.

Importantly, the impact of frameworks and their usage was not researched as part of this review.

1. Introduction

This paper reviews literature relating to competency frameworks for the professional development of researchers. It was commissioned by Vitae to contribute to the creation of a national researcher development framework.

1.1 Aims of the review

- To provide a survey of literature pertaining to competency frameworks and their development, including those relating to undergraduate students, postgraduate researchers and staff in higher education institutions, researchers working outside of higher education and broader professional competency frameworks, worldwide.
- To identify the competencies, attributes and skills included within such frameworks in order to support the development of a robust and enduring vocabulary.

1.2 Background to the review

A clear need to develop a comprehensive framework of professional development for researchers in higher education was identified at the 2008 Vitae Policy Forum. This will build on the existing Joint Skills Statement (JSS), encouraging self-reflection and professional development by researchers themselves whilst ensuring appropriate institutional support and provision. The new framework will be progressive and cover the complete researcher continuum: from postgraduate researcher to research staff to research leader.

The Researcher development framework, while being based in HE, will take into account existing frameworks from industry and internationally. Similarly, the new framework will take into account existing frameworks within higher education, including those for undergraduates, researchers and staff.

The Researcher development framework must remain relevant and have a currency to 2020, as well as have currency with employers both within and outside of HE.

An initial literature survey was commissioned in March 2009 and conducted by Dr Anne Lee at the University of Surrey. This paper considered how 'research' is defined, the role and career paths of research staff, and the skills, competences and attributes they require.

It explored various definitions of research with a focus on critical thinking, the different types of role played or potentially played by researchers and research staff and perceptions held by academic researchers themselves of their role. It considered the stages of a research career, from 'apprentice' to 'member' [of community of practice] to 'expert' to 'leader' (Rowley and McCulloch 1999) and the changes which might impact upon the career development of researchers. Finally, it explored the different attributes which might be required of research staff, both in an academic capacity but also more broadly as members of staff of an organisation.

It is the intention of this review to build on this initial survey, in particular the latter section, and consider:

- existing competency frameworks in higher education and the way in which these cater for the specific skills, competencies and attributes required by researchers and research staff
- existing competency frameworks for researchers working outside of higher education
- other competency frameworks developed or used by employers outside higher education.

2. Methodology

2.1 Defining the parameters of the review

Although the search found relatively limited literature on competency frameworks specifically for researchers (in any context), there are many generic competency frameworks in the public domain which could have been included in this review. As such, the review does not explore discipline-based/subject-specific frameworks primarily; rather, it considers generic frameworks pertaining to personal and professional development, in particular for researchers.

Somewhat unsurprisingly, the healthcare sector (worldwide) is the most notable in terms of the number of frameworks available in the public domain. These were excluded from the literature, although research or researcher competency frameworks from within the healthcare sector have been included.

Few large-scale employers place full competency frameworks in the public domain although several refer to their methodologies for both developing and delivering performance management programmes. Patterns in these methodologies are included in this review. The notable exceptions to this are higher education institutions and government organisations; many of the former and some of the latter publish in full their competency frameworks.

For undergraduates there was surprisingly little HEI-specific literature in the public domain. Where this was found it has been included but the majority of work in this particular arena has been conducted on a UK-level by the subject centres of the Higher Education Academy.

2.2 Literature Search

As well as general internet keyword searches (Google and Google Scholar), ERIC, the British Education Index and Emerald were searched. A keyword search is presented at Appendix Two.

Additionally, a selection of literature pertaining to employability and undergraduate competency is held by CRAC/NICEC in Cambridge, and this too was searched.

The Vitae networks were also engaged in this search; the networks were asked for any relevant items they held and several items were received using this method.

3. Review

3.1 Definition and use of terms

The literature is incredibly varied around its use and definition of terms within the competence and professional development field. The use of terms can be crucial, as the various models for the development of a framework hinge upon specific definitions. This section attempts to highlight different uses and definitions in order to provide some insight on the areas of particular debate to better inform the use of vocabulary in the creation of a researcher development framework.

However, it is important to note that few of the competency frameworks found during the course of this review – many of which have been developed in the last five years – refer directly to any specific theory or model.

‘To begin with, an English lesson. We need to distinguish between “competence” and “competency”. Some dictionaries lump them together and present them as interchangeable, but I suggest it is useful to use “competence” to mean a skill and the standard of performance reached while “competency” refers to the behaviour by which it is achieved.’

Rowe, C (1995) Clarifying the use of competence and competency models in recruitment, assessment and staff development, Industrial and Commercial Training, Vol. 27 No. 11 pp12-17

‘The Concise Oxford Dictionary of Current English (Sykes, 1987) defines “competency” and “competence” as: ability (to do, for a task); sufficiency of means for living, easy circumstances; legal capacity, right to take cognisance (of court, magistrate, etc.). According to the dictionary, the word is a noun and the forms of competency and competence are readily interchangeable. In the managerial literature, however, the situation is not so clear, as subtle changes in emphasis can be found.’

Moore, RD, Cheng, MI, Dainty, ARJ (2002) Competence, competency and competencies: performance assessment in organisations, Work Study, Vol. 51 No. 6 pp314-319

‘...there is a considerable conceptual and terminological confusion concerning basic concepts like competence and qualification.’

Ellstrom, P-E (1997) The many meanings of occupational competence and qualification, Journal of European Industrial Training, Vol. 21, Issue 6/7

‘Although in the 1980s and 1990s HR professionals drew a distinction between ‘competencies’ and ‘competences’, now the two terms are often used interchangeably.’

Hogg, C et al (2008) Competency and competency frameworks factsheet, Chartered Institute for Personnel and Development

Even a swift review of the literature around the creation of a framework for professional development will reveal that the words ‘competence’ and ‘competency’ are variously interpreted.

The explanation and illustration by Rowe (1995) is helpful:

‘I suggest it is useful to use “competence” to mean a skill and the standard of performance reached while “competency” refers to the behaviour by which it is achieved. In other words, one describes what people can do while the other focuses on how they do it.’

This is supported by Hogg *et al* (2008):

'Competency' is more precisely defined as the behaviours that employees must have, or must acquire, to input into a situation in order to achieve high levels of performance, while 'competence' relates to a system of minimum standards or is demonstrated by performance and outputs.'

These definitions are helpful as they raise distinctions between types of descriptor (for example 'skills', 'standards of performance' and 'behaviour'), distinctions which are crucial when considering how a framework for professional development might be developed.

By distinguishing between 'competence' and 'competency' we also gain some initial insight in the various models for the development of such frameworks, which will be explored later in the review.

In his influential book, *'The competent manager: a model for effective performance'*, Richard Boyatzis (1982) marries behaviour and skill by defining competency thus:

'an underlying characteristic of a person which results in effective and/or superior performance in a job.'

Rowe (1995) created an illustration which encapsulates the various descriptors:

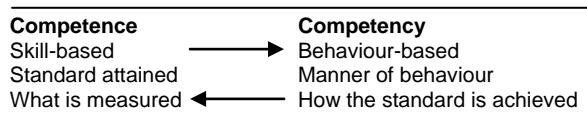


Figure 1 The interface between competence and competency (Rowe, 1997)

This illustration neatly captures the distinctions between the 'competence' descriptors of skills and standards and 'competency' descriptors of behaviour and style in which a standard can be achieved.

In addition, Ellstrom (1997) uses the word 'qualification' as another interpretation of competence:

'...the notion of qualification may now be defined as the competence that is:

- *actually required by the work task; and/or*
- *implicitly or explicitly prescribed by the employer.'*

3.2 Developing Competency Models

Much of the literature refers to an historical split between US and UK models of competence.

McBer and Company, a US consultancy (now part of the Hay Group) headed by Richard Boyatzis and chaired by David McClelland, was commissioned by the American Management Association in the late 70s to identify those characteristics that distinguish superior from average managerial performance (Moore DR, Cheng M-I, Dainty ARJ, 2002). McBer had already begun to work in this field, using contrasting methods to assess

competencies. The first involved the assessment of individuals by employers, peers and clients. The team then developed the 'Behavioural Event Interview' (BEI), a method whereby interviewees are asked to provide, through a series of non-leading questions, a detailed account of the behaviours they employed in a particular situation. From this data, themes are identified, differentiating between 'average' and 'outstanding' performers, and sets of competencies can be produced.

The Boyatzis definition (above) was articulated following the McBer research team's work in this field. Essentially, competency is defined here as a set of motives, traits and behaviours – characteristics – which enable an individual to achieve certain tasks.

"...competencies can be motives, traits, self concepts, attitudes or values, content knowledge, or cognitive or behavioral skills – any individual characteristic that can be measured or counted reliably and that can be shown to differentiate significantly between superior and average performers, or between effective and ineffective performers... Competencies include an intention, action and outcome."

Spencer, L.M., McClelland, D.C. & Spencer, S.M. (1990) Competency Assessment Methods: History and State of the Art. Paper presented at the American Psychological Association Annual Conference, Boston, Mass.

In contrast, the model established by the Management Charter Initiative in the UK (1990) took a 'functional analysis' approach; that is, the model was based on research amongst a large sample (3000) of managers to determine the activities they performed. The resulting conceptual framework and national standards supported the development of National Vocational Qualifications (NVQs), linking formal assessment with predetermined levels of competence performance (Moore DR, Cheng M-I, Dainty ARJ, 2002).

The key distinction here is between a function- or task-oriented approach and a person- or behaviour-oriented approach.

The MCI approach, although in essence used in formal assessment of competencies (NVQs), has not been fully preserved in human resources management. The McBer Behavioural Event Interview technique, though dominant for over a decade (Mansfield, RS, 2005, Practical Questions in Building Competency Models, Workitect Inc.), has also evolved.

'Because of growing confusion, many companies have abandoned standard models (such as MCI) and launched their own "competency models".'

Rowe, C (1995)

This is borne out by a paper produced a decade after Rowe by Mansfield (2005):

'Today, 30 years after the first competency model [McBer], more than half of the Fortune 500 companies are using competency modeling. Consultants working in the McBer tradition are still building many models, but these consultants have been joined by many other consultants using different methodologies. With market pressures to build models more quickly and less expensively, there is less emphasis on methodological rigor.'

Mansfield, RS (2005)

Mansfield continues by providing a variety of reasons why models have had to simplify, and why their development may have less emphasis on methodological rigour:

- changing work processes
- creation of new job roles, for which there have been few or no previous incumbents
- market demand for speed and cost efficiency (in developing a competency framework)
- speed of organisational change
- increased intensity and pace of work resulting in less time to participate in the development process
- employees' attention span, tolerance for complexity and willingness to read have diminished.

The competency frameworks that have been found during the course of this review tend to support this view, both in the relative simplicity of some and in the methodologies for development (where these are given).

More recent methodologies appear to have adapted the behaviour and task approaches, with Mansfield identifying three sources of data upon which competency models are based (often in combination):

- 1) resource panels or focus groups with subject matter experts
- 2) critical event interviews with superior performers
- 3) generic competency dictionaries.

It is important to note that, although less rigorous than the individual Behavioural Event Interview, the resource panel/focus group methodology explores both job tasks and characteristics needed for effectiveness.

The critical event interview (CEI) method can be very similar (and as rigorous) to the BEI; another way of conducting these is to probe less fully a wider selection of situations with the interviewee.

Competency dictionaries, referencing commonly encountered competencies and behaviours, can be useful in a variety of ways: as a starting point for discussion or clustering, for rating by a panel, for guidance when analysing the data gained through CEIs (Mansfield 2005).

The Chartered Institute for Personnel Development, in its 2007 Learning and Development survey, discovered that sixty per cent of organisations have a competency framework in place for their staff, and just under half (48%) of those who haven't say they intend to introduce one in the next two years. Overwhelmingly, those with a competency framework have developed these in-house (85%), either independently (52%) or with the assistance of an external consultant (33%) (Learning and Development Annual Survey Report, 2007, CIPD).

Finally, a note on the perspectives from which a framework may be developed. The frameworks that will be referenced in this review have been written from differing perspectives, the most common of which is that of an organisation seeking to recruit, retain and develop its staff. As mentioned previously, the healthcare sector appears to be the most prolific in the number of competency frameworks in the public domain, and the given perspective here is that of public safety. While both of these perspectives include professional development of staff, the overall objectives are quite distinct. Few prioritise the career progression of the individual regardless of context; although the frameworks specifically developed for researchers are usually highly transferable between higher education institutions, they rarely take into account competencies which may be developed

outside of an institution. 'Other' competencies or attributes may well be developed either in an industrial context or whilst conducting research – although the researcher may still be 'employed' by a higher education institution. This is explored further later in the report.

3.3 Sample Generic Competency Frameworks and Models

The McBer Competency Framework, as published in *Competence at Work* (Spencer, L and Spencer, S, 1993, John Wiley and Sons) and later in the *McBer Scaled Competency Dictionary* (1996, Hay Acquisition Company Inc.), outlines a series of generic competencies drawn from McBer's extensive research using the BEI methodology.

These generic competencies are reproduced in Figure 2; as Raven (Raven, J, and Stephenson, J (eds), *Competence in the Learning Society*, 2001, Peter Lang, Chapter 9) states:

'It must again be emphasised that this is not a framework for classifying observer's ratings. It is a framework for classifying the information obtained from interviews in which a carefully guided effort has been made to discover the kinds of activity people are strongly motivated to undertake and to elicit the respondent's thoughts and feelings while undertaking those activities.'

Raven, J (2001)

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1. **Achievement Orientation (ACH)**
Core: Does the person think about meeting and surpassing goals and taking calculated risks for measured gains?
 2. **Analytical Thinking (AT)**
Core: Does the person understand cause-and-effect chains and relationships?
 3. **Conceptual Thinking (CT)**
Core: Does the person match patterns? Assemble many pieces into a coherent whole? Create new ways to look at things?
 4. **Customer Service Orientation (CSO)**
Core: Does the person act on behalf of the person being served?
 5. **Developing Others (DEV)**
Core: Does the person work to develop the long-term characteristics (not just skills) of others?
 6. **Directiveness (DIR)**
Core: Does the person set firm standards for behavior and hold people accountable to them?
 7. **Flexibility (FLX)**
Core: Can the person change gears or drop the expected task when circumstances demand it?
 8. **Impact and Influence (IMP)**
Core: Does the person use deliberate influence strategies or tactics?
 9. **Information Seeking (INF)**
Core: Does the person go beyond the obvious and seek out information?
 10. **Initiative (INT)**
Core: Does the person think ahead of the present to act on future needs and opportunities?
 11. **Integrity (ING)**
Core: Does the person act in line with beliefs and values even when it is difficult to do so?
 12. **Interpersonal Understanding (IU)**
Core: Is the person aware of what others are feeling and thinking, but not saying?
 13. **Organizational Awareness (OA)**
Core: Is the person sensitive to the realities of organizational politics and structure?
 14. **Organizational Commitment (OC)**
Core: Does the person choose to act in accordance with authority, organizational standards, needs, and goals?
 15. **Relationship Building (RH)**
Core: Does the person take effort to build a personal relationship?
 16. **Self-Confidence (SCF)**
Core: Does the person take on risky tasks or conflicts with those in power over that person?
 17. **Team Leadership (TL)**
Core: Does the person lead groups of people to work effectively together?
 18. **Teamwork and Cooperation (TW)**
Core: Does the person act to facilitate the operation of a team of which he or she is a part?
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Figure 2: Generic Competencies: Summary
From McBer's Scaled Competency Dictionary (1996) as reproduced by Raven, J (2001)

For each of these generic competencies, there are in-depth scoring systems; these are based on behaviours which would support the achievement of the core competency at a number of different levels.

One example of this is reproduced in Figure 3 (below).

Developing Others (DEV)

Developing Others: Involves a genuine intent to foster the long-term learning or development of others with an appropriate level of need analysis and other thought or effort. Its focus is on the developmental intent and effect rather than on a formal role of training.

Core: Does the person work to develop the long-term characteristics (not just skills) of others?

Scoring Notes: The underlying intent to foster others' development must be clear. This is especially important for the lower levels of DEV which may otherwise be confused with lower levels of Directiveness (DIR). The developmental intent is the distinction between the two competencies.

Level	This Person:
1.	Expresses Positive Expectations of Person: Makes positive comments regarding others' developmental future: current and expected future abilities and/or potential to learn even in "difficult" cases. Believes others want to and can learn or improve their performance.
2.	Gives How-To Directions: Gives detailed instructions and/or on-the-job demonstrations, tells how to do the task, makes specific, helpful suggestions.
3.	Gives Reasons, Other Support: Gives directions or demonstrations with reasons or rationale as a training strategy. Gives practical support or assistance to make job easier for subordinate (i.e. volunteers additional resources, tools, information, expert advice). Asks questions, gives tests, or uses other methods to verify that others have understood explanation or directions.
4.	Gives Feedback to Encourage: Gives specific positive or mixed feedback for developmental purposes. Reassures others after a setback. Gives negative feedback in behavioral rather than personal terms, and expresses positive expectations for future performance or gives individualized suggestions for improvement.
5.	Does Longer-Term Coaching or Training: Arranges appropriate and helpful assignments, formal training, or other experiences for the purpose of fostering a person's learning and development. Has people work out answers to problems themselves so they really know how, rather than simply giving them the answer. This does not include formal training done simply to meet corporate requirements. May include identifying a training or developmental need and establishing new programs or materials to meet it.

**Figure 3: Summary of Scoring System for Generic Competencies
McBer Scaled Competency Dictionary (1996) as reproduced by Raven, J (2001)**

Rowe (1995) highlighted some of the issues which have arisen with the growth of organisations launching their own competency models, and in doing so provided another approach to creating a generic framework:

'This...has led to further confusion and what I call the "invention" of competencies. I have seen models that contain integrity, honest, courage, commitment, trustworthiness – none of which is, to my mind, a competency... So, what are they?

It is useful at this juncture (without overcomplicating things) to make a further distinction between behaviours that are intellectually based and those that are morally-based.,,

In my view companies should not seek for one competency model (the holy grail) so much as a framework which incorporates a series of competence and competency models which can be applied in different contexts.'

Rowe, C (1995)

This framework is illustrated in Figure 4 (overleaf). It contains an outer circumference of 'soft' attributes, a middle ring of behaviours and a hard core of measurable competences.

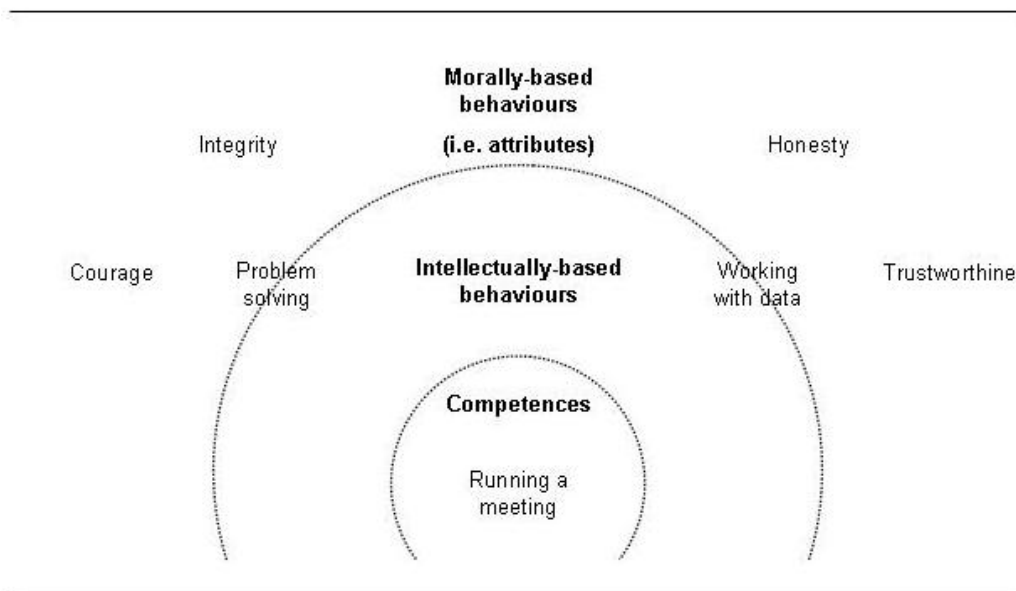


Figure 4: A competency framework Rowe (1995)

This framework provides one mechanism by which competencies can be grouped.

Specifically in UK higher education, although we must be clear that this is **not in itself** a competency framework, the Higher Education Role Analysis (HERA) exercise provides a set of categories against which each role in an HEI is assessed.

HERA is a job evaluation scheme, designed and developed by a consortium of over 100 UK HEIs as well as representatives of the national trades unions. The Equal Opportunities Commission (now the Equality and Human Rights Commission) recognised HERA as a non-discriminatory job evaluation scheme. It aims to assess the relative value of roles equitably, based on the wider aspects of a role rather than specific tasks. There are fourteen categories or ‘elements’ against which roles are evaluated. A weighting is given to each of these elements. These elements and their weightings are shown in Figure 5 (below).

ELEMENT		WEIGHTING
Communication	This element covers communication through written, electronic or visual means and oral communication, formally and informally. This may include the need to convey basic factual information clearly and accurately conveying information in the most appropriate format, and explaining complex or detailed and specialist information.	8%
Teamwork and Motivation	This element covers team work and team leadership when working in both internal and external teams. This may include the need to contribute as an active member of the team, motivating others in the team, and providing leadership and direction for the team.	7%
Liaison and Networking	This element covers liaising with others both within and outside the University and creating networks of useful contacts. This may include passing on information promptly to colleagues, ensuring mutual exchange of information, influencing development's through one's contacts, and building an external reputation.	6.5%

ELEMENT		WEIGHTING
Service Delivery	This element covers the provision of help and assistance to a high standard of service to students, visitors, members of staff and other users of the University. This may include reacting to requests for information or advice, actively offering or promoting the services of the institution to others, and setting the overall standards of service offered.	7%
Decision Making Processes and Outcomes	This element covers the impact of decisions within the institution and externally. This may include decisions which impact on one's own work or team, decisions which impact across the University, and decisions which could have significant impact in the longer term within or outside the University.	7%
Planning and Organising Resources	This element covers organising, prioritising and planning time and resources, be they human, physical or financial. This may include planning and organising one's own work, planning work for others on day to day tasks or on projects, carrying out operational planning, and planning for coming years.	7%
Initiative and Problem Solving	This element covers identifying or developing options and selecting solutions to problems which occur in the role. This may include using the initiative to select from available options, resolving problems where an immediate solution may not be apparent, dealing with complex problems, and anticipating problems which could have major repercussions.	8%
Analysis and Research	This element covers investigating issues, analysing information and carrying out research. This may include following standard procedures to gather and analyse data, identifying and designing appropriate methods of research, collating and analysing a range of data from different sources, and establishing new methods or models for research, setting the context for research.	7%
Sensory and Physical Demands	This element covers the sensory and physical aspects of the role required to complete tasks. This may include physical effort, co-ordination and dexterity, applying skilled techniques and co-ordinating sensory information, and high levels of dexterity where precision or accuracy is essential.	5%
Work Environment	This element covers the impact the working environment has on the individual and their ability to respond to and control that environment safely. This may include such things as the temperature, noise or fumes, the work position and working in an outdoor environment.	6.5%
Pastoral Care and Welfare	This element covers the welfare and well being of students and staff within the institution in both formal and informal situations. This may include the need to be aware of the support services available, giving supportive advice and guidance, and counselling others on specific issues.	6%
Team Development	This element covers the development of the skills and knowledge of others in the work team. This may include the induction of new colleagues, coaching and appraising any individuals who are supervised, mentored or managed by the role holder, and giving guidance or advice to one's peers or supervisor on specific aspects of work.	7%
Teaching Training and Learning Support	This element covers the development of the skills and knowledge of students and others who are not part of the work team. This may include providing instruction to students or others when they are first using a particular service or working in a particular area, carrying out standard training and the assessment and teaching of students.	9.5%
Knowledge and Experience	This element covers the relevant knowledge needed to carry out the role, however acquired, whether this is technical, professional or specialist. This may include the need for sufficient experience to carry out basic, day to day responsibilities, the need for a breadth or depth of experience to act as a point of reference for others, and the need to act as a leading authority in one's field or discipline.	8%

Figure 5: HERA Fourteen Elements and Weightings
 Information taken from University of Cambridge website www.admin.cam.ac.uk/offices/hr/reward/hera.html

As mentioned, these elements alone do not profess to be a competency framework. However, the consortium responsible for managing HERA (Educational Competence Consortium: ECC) are clear that HERA should be integrated with the wider human resources function, and that these categories can and should act as 'building blocks' for recruitment and selection, performance management, career development and succession planning.

The name of the consortium and its origins show an emphasis on competences; the consortium's purpose as defined at its formation in 1994 was:

'To use the combined resources of member Universities to explore approaches, including competences, for developing an appropriate, practicable, equitable and cost effective methodology for analysing job content in Higher Education institutions in a way which is responsive to the differing needs of institutions to support a range of local HRM objectives.'

EEC (2003), The History of HERA

Further, the development of HERA specified that its methodology should combine knowledge and contextual factors with behavioural competencies:

'The Consortium wanted to move away from the traditional concepts of job evaluation based on sizing tasks and defensive responses; they wanted to take a fresh approach. They believed that, in the future, it would be important to be able to recognise the value of the contribution made by individuals in a way that would reflect role requirements in the context of their employing institution.'

In the light of the feasibility study report, made in Summer 1995, the Management Committee decided it wanted a scheme that would combine:

- *a factor-based approach incorporating "input" (what an individual brings to a job or role, e.g. knowledge and experience) and contextual factors*
- and
- *a "throughput" approach focusing on the process by which results are achieved (how an individual performs effectively, i.e. their behavioural competencies).'*

EEC (2003)

The approach taken by the external consultancy hired to develop the scheme was manifold:

- series of individual and group interviews with a cross-section of staff at 14 HEIs
- interview involved discussion of the topic 'what is of value in higher education', prompted by a card exercise
- feedback on data analysis from Management Committee, academic advisers to the project and trades unions
- exploration of a first draft with a further 20 HEIs
- further refinement from experts and advisers – leading to the creation of the 14 elements
- testing the interview method and role profiles with over 200 individuals
- training of institution staff and development of an online tool to support assessment.

As can be seen in Figures 2 and 5, the language differs somewhat – particularly in the style of the descriptor. In the former, questions are used to help define the meaning of the competency; in the latter, actions or tasks are used, despite the combined task-focused/behavioural approach taken in its development.

Not all UK HEIs have used the HERA framework, however. One of the most often-cited job evaluation schemes (in industry in general), the Hay Method of Job Evaluation was adapted for use in HEIs; as a result, several (though not the majority) HEIs have used this approach

(see Figure 6 below). Again – particularly as the McBer Framework is the ‘Hay/McBer’ Framework – it must be clarified that the Hay Method is not a competency framework.

The Hay approach to job evaluation is based on analysing and measuring the extent to which each job in an organisation requires the three elements of:

Know-How

Problem Solving

Accountability.

Additionally Physical and Environmental factors will have a significant impact for some roles.

The elements involved in the Hay Methodology can be defined as follows:

KNOW-HOW is defined as the sum of every kind of knowledge, skill and experience to do a job. It consists of three specific elements:

Depth and Breadth of Know-How

This relates to the depth and breadth of knowledge and experience of practical procedures, specialised skills and techniques and professional disciplines, and covers the specialised knowledge required to do a given job. Such knowledge may be acquired either through formal education or through experience and exposure to practical issues, or a combination of these.

Planning and Organising

This looks at the requirement of jobs for planning and organising and relates to factors such as complexity, time span and scale. It can therefore relate to activities within an individual role and/or that required in managing a network of relationships, line management or advising others to achieve a given end.

Communicating/Influencing

The factor measures the requirement within jobs for working with, and through, others to achieve end results. As such it takes into account elements such as the requirement to exchange information, influence, persuade, negotiate, motivate and change behaviour.

PROBLEM SOLVING is defined as the self-starting thinking required by the job holder in analysing and evaluating information to arrive at conclusions, take actions and make recommendations. It is influenced by:

The Thinking Environment

The extent to which the jobholder has rules, instructions, precedents, policies or parameters to define those issues which should be addressed. The fewer of these that are in place, the greater is the scope for problem solving in a job.

The Thinking Challenge

The complexity and variety of the tasks that the jobholder is required to tackle and the extent to which innovation and originality are necessary.

ACCOUNTABILITY. Accountability is the answerability for action and for the consequences of that action. It is the intended effect of the job on the university, the wider academic community or discipline.

All jobs are accountable for producing or achieving certain end results. The accountability of a job is analysed and measured in terms of three dimensions:

- The extent to which the job holder has Freedom to Act, or can make decisions within limits defined by rules, procedures, policies, precedents or senior direction.
- The type of service provided or the scope of the roles impact on the university, the wider academic community or discipline.

PHYSICAL AND ENVIRONMENTAL FACTORS. These factors assess physical and environmental elements involved in the performance of jobs, over and above those experienced in a normal office environment.

Physical Effort and/or Strain

The physical effort and/or strain placed on the job holder in performing the job to the required standard.

Working Environment

The unfavourable working conditions to which the job holder is necessarily exposed in order to carry out the job to the required standard.

Figure 6: The Hay Method of Job Evaluation (taken from the University of Bristol website)

The predominant main element is 'know-how'; the underlying principle behind this is that the problem-solving requirements of a role should not be greater than the know-how (or skills, knowledge and experienced) requirements, and the accountability requirements should not be greater than the problem-solving requirements.

Under each of the main elements, the specific elements have a series of levels and the number of levels varies by element.

One example of this is the 'Depth and Breadth' specific element of 'Know-How', for which there are eight levels (see Figure 7 below).

Level A

Role requires basic education plus work instruction and demonstration reinforced by work experience over a few days/weeks.

Level B

Role requires familiarisation in standardised work routines and/or simple use of equipment and machines generally gained through some formal training reinforced by work experience over a period of months.

Level C

Role requires a thorough understanding of the techniques and procedures of a complex process or specialised system and may involve the ability to use specialised equipment. Knowledge and skill are normally acquired through broad and significant work experience.

Level D

Role requires knowledge and understanding in methods, systems and procedures gained by extensive practical experience and/or through formal training possibly leading to a part professional qualification.

Level E

Role requires applied and theoretical knowledge, and an ability to work out problems or devise new approaches from first principles. This level is normally associated with a relevant professional or academic qualification or a level and range of understanding gained through a detailed grasp of involved practices and procedures.

Level F

Role requires authoritative understanding of a specialised field gained through broad and deep experience built on concepts and principles, or through wide exposure to complex practices and precedents.

Level G

Role requires mastery of concepts, principles and practices gained through deep development and investigation in a major subject area leading to wide recognition, or through wide experience and definitive leadership of operations, functions and services.

Level H

Role requires outstanding knowledge and recognised world leadership in a profound and broad ranging discipline.

Figure 7: Depth and Breadth of Know How (taken from the University of Bristol website)

These frameworks are not included here as best practice; rather they are varied approaches which act only as examples.

3.4 Researcher development frameworks

Before we explore frameworks which have been developed specifically for researchers, it might be useful to return to the perspectives from which a framework may be written, which we began to explore at the end of Section 3.2.

'The relationship between researchers and their employment organisation is qualitatively different from that of 'normal' professions. The work conducted by professionals in an organisation is work for the organisation and for goals set by the organisation. This relationship... can be applied to the teaching role of academics in universities but not to their role as researchers.'

Gläser, J and Laudel, G (2009), Understanding the Academic Career (DRAFT)

Gläser and Laudel explore the different components of an academic career, arguing that it is an intertwining of three different careers:

- organisational (sequence of **positions** which provide salary and resources)
- community (sequence of **stages of participation** in knowledge production)
- cognitive (sequence of **research topics**).

Gläser and Laudel consider specifically the transition from 'apprentice' stage to independent researcher or 'colleague' stage in the community career. This is significant as it indicates the progression towards autonomy, which is a core characteristic of development of an academic career in two ways: the first, an independence of judgement when considering research problems and ways in which to approach these, and the second, this necessarily means an independence from their organisation – the 'markers' for the researcher come from within their community rather than from their employer. This differs to the kind of progression which might be expected in a non-academic career (or, as Gläser and Laudel term it, a 'career of achievement'); certainly this is borne out by the distinctions evident between organisation- or employer-led frameworks for researcher development and frameworks which have emerged from scientific communities.

Looking again at the UK-wide job evaluation project across higher education, the Joint Negotiating Committee for Higher Education Staff (JNCHES) developed a series of academic role profiles for use with job evaluation schemes in HEIs in 2004 (amended in 2005). The profiles are divided into three categories: teaching and scholarship, teaching and research and research. The language used in the profiles is more closely-aligned to the HERA framework: each category has a series of levels, and each level has a common set of grouped skills and actions. These groupings each have a descriptor which describes the level at which a role can be graded (JNCHES, 2005).

The grouped skills and actions are used across the profiles are:

- Teaching and learning support
- Research and scholarship
- Communication
- Liaison and networking
- Managing people
- Teamwork
- Pastoral Care
- Initiative, problem-solving and decision-making
- Planning and managing resources
- Sensory, physical and emotional demands
- Work environment
- Expertise.

While teaching, learning support, research and scholarship are included, many of the other elements of these profiles are very much organisation-focused and driven.

Again, this does not profess to be a competency framework and there is significant guidance on the usage of these profiles – it is clearly stated, for example, that they are to be used with a job evaluation scheme rather than to be used as a substitute or as a standalone framework. For our purposes, however, they provide a series of groupings which are useful to note given their widespread usage across HE.

Contrast this with the Joint Statement of the Research Councils' Skills Training Requirements for Research Students (JSS), agreed by the UK research councils and UK GRAD in 2001, then we see some clear distinctions.

The JSS has seven core groupings of 'descriptors', which cover both research and personal development:

- Research skills and techniques
- Research environment
- Research management
- Personal effectiveness
- Communication skills
- Networking and teamworking
- Career management

UK GRAD Programme (2001) Joint Skills Statement

The JSS is important; it outlines the expectations of the Research Councils of postgraduate researchers and it was widely adopted by higher education institutions to support postgraduate career development.

In 2004, a working group from the Joint Quality Initiative (JQI) published a report considered the development of a set of descriptors to articulate the outcomes of research-based and professional doctorates. Descriptors had already been proposed for Bachelors' degrees (or 'first cycle') and for Masters' degrees (second cycle) in 2002; following the Berlin Communiqué in 2003 which added the doctoral degree (third cycle) to the Bologna process, the JQI developed the descriptor below.

Qualifications that signify completion of the third cycle are awarded to students who:

- *have demonstrated a systematic understanding of a field of study and mastery of the skills and methods of research associated with that field;*
- *have demonstrated the ability to conceive, design, implement and adapt a substantial process of research with scholarly integrity;*
- *have made a contribution through original research that extends the frontier of knowledge by developing a substantial body of work, some of which merits national or international refereed publication;*
- *are capable of critical analysis, evaluation and synthesis of new and complex ideas;*
- *can communicate with their peers, the larger scholarly community and with society in general about their areas of expertise;*
- *can be expected to be able to promote, within academic and professional contexts, technological, social or cultural advancement in a knowledge based society.*

Joint Quality Initiative Working Group (2004), Shared 'Dublin' descriptors for Short Cycle, First Cycle, Second Cycle and Third Cycle Awards

While there is a heavy slant on the actions directly related to research, the Dublin descriptor for the third cycle also includes behaviours.

Both the JSS and the Dublin descriptor were developed outside of, but in close consultation with, higher education institutions.

Another significant development since the Joint Skills Statement has been the implementation of HERA and other job evaluation schemes in higher education institutions as explored earlier. This means that in the more recent history HEIs have explored the way in which a researcher might be 'described' in terms of outcomes, attributes and behaviours.

It is useful to note that, though perhaps self-evident, HERA, Hay and other bespoke evaluation schemes – with associated job profiles – have been developed either by or in close consultation with institutional staff, for use within HEIs.

The following section explores a selection of varied frameworks for the development of researchers. While many come from HE institutions, several from outside this world have also been included for comparison.

The section identifies the source and type of framework, audience, the way in which the descriptors are organised and the method of assessment. Full descriptors have not been reproduced within this report; links to these are included instead.

3.4.1 Examples of Researcher Frameworks

Charles Darwin University (Au) 2006 Staff Competency Framework

<http://www.cdu.edu.au/pmd/Workforce%20Development/CDUStaffCompetencyFramework17Oct2006.pdf>

Audience: all academic staff

Organisation of descriptors: core competency, elements of competency, performance criteria

Assessment model: Likert-type scale

Core Competencies

- Operation of the University and the environment in which it functions
- Working with your community
- Work attributes and workplace skills
- Leading and managing people
- Assisting staff and students to access programmes and services and achieve at the University
- Advancing appropriate research and its application
- Student-centred innovative teaching
- Developing business opportunities

Department for Work and Pensions (UK) 2009

Competency Framework for the Operational and Social Research Professions

<http://research.dwp.gov.uk/working/applying/experience.asp>

Audience: part of a large framework which is in place for all staff at DWP

Organisation of descriptors: overview set of categories which are subdivided; these have an overview descriptor each as well as very detailed descriptors, at 5 grades. NB there are different detailed descriptors for operation and social researchers.

Assessment model: details unavailable in public domain.

Overview of descriptors:

- Delivering a professional service
 - Applying professional skills and knowledge
 - Acquiring and developing professional skills and knowledge
 - Maintaining professional integrity
- Delivering a customer-focused service
 - Responding to customer needs
 - Providing excellent customer service
- Analysing, improving and changing
 - Analysing and using evidence
 - Improving performance continuously
 - Engaging with change
- Managing people and performance
 - Deploying people and resources effectively
 - Delivering results
 - Managing finance
- Building capacity
 - Developing knowledge and skills
 - Working collaboratively
 - Communicating with impact
- Leading
 - Demonstrating integrity
 - Providing direction

Faculty of General Dental Practice (UK), The Royal College of Surgeons of England 2007

Research Competencies Framework

<http://www.fgdp.org.uk/pdf/competencies.pdf>

Audience: individuals on the Faculty Career Pathway (dental practitioners) to support the development of research competencies

Organisation of descriptors: domain, competency (competency has full description with suggested methodology and further reading)

Assessment model: three levels – familiar with, knowledge of, competent at

Domains

- Practical Skills: develop, maintain, promote and show awareness of the vision, culture and strategic direction of research and the development of methods used within the dental sphere
- Problem-solving, thinking and communication skills: provide a framework to enable continuous improvement and evaluation of research standards and methods used to improve the qualities of dental care

- Personal Attitudes and Professional Ethics: contribute to the development, delivery and evaluation of research, in partnership and alone, to meet the needs of fellow professionals, stakeholders and the community
- Dissemination: contribute to the development, delivery and evaluation of dental care services, in partnership and alone, to meet the needs of fellow professionals, stakeholders and the community
- Roles and Functions: manage and evaluate systems and resources to provide efficient and ongoing support to the dental community.

Government Social Research Profession (UK) 2009 Competency Framework

http://www.civilservice.gov.uk/Assets/gsr_competencies_framework_tcm6-5929.pdf

Audience: all research staff working for the Government Social Research Unit, house by HM Treasury

Organisation of descriptors: grouped by skill set; each skill set has a number of competencies attached, with more detailed descriptors. Further to this high level description, each descriptor has accompanying positive/negative indicators, which differ between five grades of researcher (from research officer to chief research officer).

Assessment model: details unavailable in public domain.

Skill sets and competencies

- Delivery skills
 - Policy and delivery focus
 - Delivering results
 - Learning and improving
- Intellectual capacity
 - Critical analysis and decision making
 - Constructive thinking
 - Professional expertise
- Interpersonal skills
 - Developing constructive relationships
 - Communicating with impact
- Leadership and management
 - Leading and directing

Joint Negotiating Committee for Higher Education Staff 2005 Academic Role Profiles

http://www.ucu.org.uk/media/pdf/4/f/jnches_academicroleprofiles_guidance_1.pdf

Audience: All academic staff, classified as teaching and scholarship-focused, teaching and research-focused and research-focused.

Organisation of descriptors: Five levels (i.e. at which one can be assessed) for each of the three classifications, 12 categories (i.e. competency) which apply across each classification and level and descriptors for each category.

Assessment: specifies they are to be used within a recognised job evaluation scheme (both the Hay and HERA methods use the JNCHES profiles)

Categories

1. Teaching and learning support
2. Research and scholarship
3. Communication
4. Liaison and networking
5. Managing people
6. Teamwork
7. Pastoral care
8. Initiative, problem-solving and decision-making
9. Planning and managing resources
10. Sensory, physical and emotional demands
11. Work environment
12. Expertise

Natural Environment Research Council 2008 Merit Promotion Scheme

Audience: All NERC staff across all functions

Organisation of descriptors: Overall merit promotion criteria. Merit promotion indicators are divided by work area and grade (band), using the same categories. Pen pictures are available to help users identify whether they meet the criteria for merit promotion.

Assessment: written applications are made to assessment panels.

Merit Promotion Criteria

- Your work has developed to a higher level through your application of your individual skills and/or specialist knowledge.
- You have been working at the level expected of the higher band for a sufficient period of time for this to be clearly demonstrable and this performance is expected to be sustained.
- You have the personal skills and qualities needed for the higher grade and you are capable of adapting to meet future NERC needs.
- It is in the organisation's interest and benefit for you to work at the higher level.

Merit Promotion Indicator Categories

- Skills
- Outputs
- Leadership/Management/Teamwork
- Professional Activity and Development
- Stakeholder Focus.

Office of National Statistics Recruitment and Development Centre Competency Frameworks for Researchers and Statisticians

Audience: All existing and potential ONS researchers and statisticians

Organisation of descriptors: There are two different sets of competency frameworks: a recruitment framework and a framework for existing staff. These overlap significantly but differ in style, with different types of descriptor. For the recruitment framework there are three levels, each with 8-10 core competencies. For the existing staff framework there are two levels, each with the same core and technical groupings of competencies.

Assessment: For recruitment there is a comprehensive assessment process which includes a competency based interview, group work, presentation and test. The framework for existing staff is used as the basis for professional development.

Recruitment Frameworks

Graduate Competency Framework:

- Interpersonal qualities/sensitivity
- Communicating
- Professional areas
- Managing work
- Core and desirable technical knowledge
- Collection of data
- Analysis and interpretation
- Dissemination

Experienced Professionals Framework:

As graduate but additionally:

- Managing/leading

Senior Professionals Framework:

As experienced professional but additionally:

- Strategic thinking.

Existing Staff Framework

ONS Generic Competencies

Competency areas	Sub-competency			
Working with others	Collaborating	Team building and team working		
Communicating	Written communication	Verbal and presentation skills	Influencing/negotiating	Maintaining confidentiality
Strategic thinking	Leadership	Strategic thinking	Managing change	
Managing people and developing self and others	Developing others	Developing self	Managing performance	
Managing work	Planning	Finance and resource management	Project and programme management	

ONS Specialist Competencies for careers within the Research, Statistical and Economist professions

Competency areas	Sub-competency					
Collection of data to meet customer requirements	Knowledge about sources	Identifying data fit for purpose	Surveys and data collection	Managing data	Manipulating data	
Analysis and interpretation to meet customer requirements	Establishing information needs within an analytical context	Translating needs into tailored analytical solutions	Awareness of context	Analysing data (e.g. analysis of longitudinal time series, small areas,	Understanding economics, e.g. uses micro and/or macroeconomic	Interpreting statistical and economic output

			economic, geographic, demographic data	principles and econometric methods
Dissemination	Disclosure control	Presenting statistics and economic analysis		

University of Bristol Job Evaluation Scheme 2005 Job Evaluation Categories and Role Profiles <http://www.bris.ac.uk/personnel/reward/jobeval/>

Audience: The job evaluation categories apply to all staff (as does the scheme); the role profile information below is relevant to academic staff only, classified as teaching and scholarship-focused, teaching and research-focused and research-focused. JNCHES role profiles formed part of the basis for the development of the profiles; the scheme is broadly based on Hay.

Organisation of descriptors: Five levels (i.e. at which one can be assessed) for each of the three classifications, 6 sets of descriptors

Assessment: to be used within the University of Bristol job evaluation scheme; for academic staff in particular this takes the form of job matching against a set of locally-agreed benchmarks.

Job evaluation categories

Know How

- Depth and range of know how
- Planning and organising
- Communicating and influencing

Problem Solving

- Thinking environment
- Thinking challenge

Accountability

- Freedom to act
- Nature and area of impact

Role Profiles

- Role Summary
- Qualifications, Skills, Knowledge and Experience Needed at Appointment
- Responsibilities:
 - Teaching Responsibilities
 - Research Responsibilities
 - Other Activities Expected
- Relationships and Contacts

University of Stirling 2009 Researcher Development Framework

<http://www.research.stir.ac.uk/supporting/infostaff/documents/ResearchFramework2009.pdf>

Audience: Researchers Grades 6 and 7 (National Library of Academic Role Profiles Research 1 and 2) and Researchers Grades 8 and 9 (National Library of Academic Role Profiles Research 3 and 4)

Organisation of descriptors: Strands, researcher outputs, researcher descriptors, researcher training and development opportunities

Assessment: not available in public domain

Researchers 1 and 2

Strand	Output	Descriptor
Research	Communicating	Written and/or oral communication in a range of situations, convey information accurately to a specialist audience using a range of media e.g. conferences, lectures, journals, newspapers etc.
	Networking	Exchange information, influence developments and begin to build a reputation. Participate in internal networks and make external contacts. May include relevant organisations and/or individuals based internationally.
	Team working	Collaborate with others in research projects, liaise with colleagues and students. Mentor peers. Contribute to meetings and develop effective working relationships.
	Service delivery	Provide assistance to students, visitors, members of staff and other users of the institution. React to requests for information or advice; actively offer or promote the services of the institution. Conduct research projects according to agreed deadlines and create a positive image of the institution. Find and apply for own research funding.
	Planning and organising	Organise and prioritise time, resources and budgets for a research project. This may include planning and organising one's own work and contributing to planning the work of others.
	Analysis and research	Contribute to the design and implementation of research projects. Follow standard procedures to gather and analyse data; identify and design appropriate methods of research; collate and critically analyse a range of data and establish new methods or models for research.
	Teaching and learning	Develop the skills and knowledge of others who are not part of the research team. May include instruction; carrying out training and assessment on undergraduate and masters teaching programmes. Support PhD students, not necessarily as a supervisor.
Career development	Career and personal development Be aware of research and/or other career opportunities. Develop own personal and professional development plan. Recognise own strengths and weaknesses and take measures to address areas in need of development. Present skills, personal attributes and experiences effectively both orally and in writing.	

Researchers 3 and 4

Strand	Output	Descriptor
	Communicating	Make significant presentations at conferences including international audiences. Disseminate complex information to a wide range of audiences using high profile media.
	Networking	Make an original contribution to practice in own subject area. Lead collaborative partnerships with external bodies. Negotiate with internal and external bodies. Provide advice to external bodies. Act as arbiter in disputes.
	Team working/Leading	Work as Principal Investigator. Chair committees and participate in institutional decision making. Monitor service levels and anticipate development opportunities. Provide academic and departmental leadership and participate in institutional strategic decision making. Coach and mentoring junior staff.
Research	Service delivery	Lead bids for research grants and consultancy projects. Lead development and implementation of departmental research strategies. Promote the work of the department and the institution. Ensure compliance with institutional policies and strategic plans. Have a thorough understanding of institutional management systems and wider Higher Education environment including equal opportunities.
	Planning and organising	Lead and manage research projects. Provide project management advice and determine allocation of departmental resources. Resolve research problems.
	Analysis and research	Participate in quality assurance with external bodies. Lead creative approaches to research and commercial challenges. Identify areas for development of new projects. Contribute to the management of quality in own research area.
Teaching and learning	Teaching and learning	Supervise postgraduate research students. Contribute to teaching programmes and curriculum development in own area.
Career development	Career and personal development	Mentor staff on matters related to personal, professional and career development. Contribute to the appraisal process. Balance competing pressure of research, management and administration.

University of Surrey 2005

Job Families and Competency Framework

http://portal.surrey.ac.uk/pls/portal/docs/PAGE/HUMANRESOURCES/RP/UNIVERSITY_OF_SURREY_COMPETENCY_FRAMEWORK2.DOC
http://portal.surrey.ac.uk/portal/page?_pageid=712,313941&_dad=portal&_schema=PORTAL

Audience: Competency framework applies to all staff; example below includes detail on the Research and Teaching Family.

Organisation of descriptors:

- Competency framework: divided by core and technical competencies; core apply across all staff, graded in three levels
- Job families: there are four job families, which have up to seven levels at which a job may be evaluated. Each level is broken down into three broad categories. These are then subdivided into family-specific groupings.

Assessment: competency framework is used for CPD and recruitment purposes, in conjunction with job families. Job families are also used for the institution's Hay job evaluation scheme.

Competency Framework Core Competencies

- Communication
- Adaptability/flexibility
- Customer/client service and support
- Planning and organising
- Teamwork
- Continuous improvement
- Problem-solving and decision-making
- Leadership/management
- Creative and analytical thinking
- Influencing, persuasion and negotiation skills
- Strategic thinking
- Technical competency

Job Family: Research and Teaching

The Research and Teaching family begins at Level 3 and goes to Level 7.

- Representative Work Activities
 - Research (and specific responsibilities for more research-focused roles)
 - Teaching (and specific responsibilities for more teaching-focused roles)
 - Management and administration
- Knowledge, Skills and Experience required by the jobholder
 - Also specific responsibilities for more research-focused roles
 - Also specific responsibilities for more teaching-focused roles
- Desired Outcomes/Achievements

Research and Teaching Family: Outline

Overall Definition: Roles in this family are wholly or mainly focused on research and teaching. They may combine elements of research, teaching and leadership or

management, but the relative emphasis on these elements and the nature of the contribution will vary. Some roles will be more orientated towards research, while others will tend to concentrate on teaching, leadership and management activities. In the higher levels, there will be a considerable reputation in the UK and internationally, and significant impact on the discipline and on research income.

Level 3 Summary: Roles at this level are generally concerned either with assisting a research team or group by carrying out analyses and tests where the method and purpose are clear, or teaching within a clear and established programme.

Level 4 Summary: Roles at this level may represent the early stages of an academic career before the individual progresses to Level 5 or a specific set of responsibilities within an established research or teaching programme. There may be a combination of research and teaching, with appropriate organising and managing in support of these activities and possibly some team leadership or a specific focus on research or teaching.

Level 5 Summary: Roles at this level are held by individuals experienced in research and/or teaching, often after progression from Level 4. In some cases, their contribution spans research, teaching and leadership or management, although the relative importance of each of these strands will vary from role to role; in others, there remains a concentration on either research or teaching. The research has measurable outcomes and is reflected in growing reputation; the teaching design and delivery for all student levels reflects current thinking and may encompass innovative methods; the contribution to the department through leadership and management may be significant.

Level 6 Summary: Roles at this level commonly reflect extensive professional experience, and may include substantial contributions in research, teaching and leadership or management. There may be a greater depth in one or two of these areas, reflecting a predominant focus on research, on teaching, or on leadership/management, though some roles offer an even spread between the three areas. Individuals will have a substantial reputation in their field, and make a significant impact on the institution and on their discipline. Roles which focus on research will involve an established international reputation and a clear record of impact shown for example in substantial and sustained research income.

Level 7 Summary: Roles at this level reflect recognised leadership and sustained and substantial reputation in research and/or teaching in a major discipline. There will also be significant leadership responsibilities on behalf of the department and/or the University, and there will be a significant leadership or management contribution. There will be a high reputation internationally, based on an extensive track record of innovative research and/or teaching with a major influence on the discipline; and a significant impact shown for example in sustained influence on research income. Any teaching specialists at this level will have broadened and deepened their impact on teaching methods and systems through extensive and widely recognised research.

3.4.2 Researcher Framework Grouped Competencies

Using the examples given above, averages were recorded to gain an understanding of both the variety and frequency of competencies.

Competencies were included if they featured in the first or second rung of their respective frameworks.

Key

CDU:	Charles Darwin University
DWP:	Department for Work and Pensions
FGDP:	Faculty of General Dental Practice
GSR:	Government Social Research Network
JNCHES:	Joint Negotiating Committee for Higher Education Staff Academic Role Profiles
NERC:	Natural Environment Research Council
ONS:	Office of National Statistics

Competency	Frequency	HEIs	Non-HEIs
Contribution to and development of research	9	Bristol, CDU, JNCHES, Stirling, Surrey	FGDP, GSR, NERC, ONS
Leadership and management (including people management)	7	CDU, JNCHES, Surrey	DWP, GSR, NERC, ONS
Expertise/Skill	7	Bristol, JNCHES, Surrey	DWP, GSR, NERC, ONS
Communications, influence and negotiation	6	Bristol, Stirling, Surrey	DWP, GSR, ONS
Teamwork	6	JNCHES, Stirling, Surrey	DWP, NERC, ONS
Initiative, problem-solving and decision-making	6	Bristol, JNCHES, Stirling, Surrey	FGDP, GSR
Service and delivery	6	Stirling, Surrey	DWP, FGDP, GSR, NERC
Teaching and learning	5	Bristol, CDU, JNCHES, Stirling, Surrey	
Planning, organisation and building capacity	5	Bristol, Stirling, Surrey	DWP, FGDP
Career development and continual improvement	5	Stirling, Surrey	DWP, GSR, NERC
Supporting students/stakeholders	3	CDU, JNCHES	NERC
Liaison, networking and relationships	3	Bristol, JNCHES	GSR
University/work environment	2	CDU, JNCHES	
Dissemination	2		FGDP, ONS
Adaptability/flexibility	2	Surrey	DWP
Professionalism	2		DWP, FGDP
Creative/analytical thinking	2	Surrey	DWP
Strategic thinking	2	Surrey	ONS
Managing resources	2	JNCHES	GSR
Technical competency	2	Surrey	ONS
Community	1	CDU	
Innovation in teaching	1	CDU	
Accountability	1	Bristol	
Business development	1	CDU	
Interpersonal skills	1	ONS	
Managing work	1		ONS
Sensory, physical and emotional demands	1	JNCHES	

3.4.3 Non-research competency frameworks**Corporate**

Few corporate employers publish the full literature on internal competency frameworks so it has been challenging to record here any useful comparisons. The one comprehensive example is from a multinational professional services firm; this was developed to provide a common, global language for the business following a merger between two large organisations.

The framework divides 'capabilities' into 'core' and 'market' (i.e. function-focused). The framework is explicit concerning its basis in the firm's international business strategy and values as an organisation: core capabilities are derived from the firm's core attributes and underpin the global business strategy and market capabilities reflect the firm's practice model, which is based on client need.

There are six market capabilities:

Capabilities:

- Strategy/strategic change
- Process/process improvement
- Technology/technology solutions
- Industry
- Project Management
- Practice Building

Each capability has different competencies or specialist capabilities and these vary depending on the market capability.

Each competency has six levels of proficiency, for which there are several descriptors. These are applied across all market competencies.

There are 16 core capabilities:

- Focus on Client Success
- Strategic Leadership
- Making Quality Judgements
- Organising for Results
- Entrepreneurial Spirit
- Leveraging Intellectual Assets
- Flexibility/Handling Ambiguity
- Motivating Others
- Co-operation and Teamwork
- Developing Others
- Interpersonal Effectiveness
- Continuous Professional Development
- Creativity and Innovation
- Communicating with Impact
- Working Globally
- Living our Values.

Each of these has three descriptors and there are only two levels of proficiency: foundation and mastery.

The guidelines for employees are comprehensive as there is an expectation of staff to self-assess against the criteria as a core part of their professional development.

While there is some crossover with this framework and researcher-specific frameworks, few (if any) of the researcher frameworks are as in depth or provide as comprehensive a programme of self-development for the individual. In addition, the employer framework consistently follows the behavioural methodology, where methodologies are not always clear or consistent for the researcher frameworks (regardless of which sector they are from).

Undergraduate

Between 2004 and 2006 the Higher Education Academy (HEA) published a series of Student Employability Profiles, working with Academy York and the Council for Industry in Higher Education (CIHE). These were revised and republished in 2007.

Profiles intend to identify the skills that can be developed through the study of a discipline based on subject benchmark statements developed by UK higher education academic communities and copyrighted by the QAA (Rees, C., Forbes, P. and Kubler, B. Student Employability Profiles: a guide for higher education practitioners, Higher Education Academy 2007).

The CIHE had surveyed its corporate members to create a list of those employability skills, attributes and competencies which are observed in individuals who can transform organisations and add value – very much along the lines of the Hay/McBer methodology.

This generic list comprises:

- **Cognitive Skills/Brainpower:** The ability to identify, analyse and solve problems; work with information and handle a mass of diverse data, assess risk and draw conclusions. (Analysis, Attention to detail, Judgement)
- **Generic Competencies:** High-level and transferable key skills such as the ability to work with others in a team, communicate, persuade and have interpersonal sensitivity. (Image, Influencing, Interpersonal Sensitivity, Planning and organising, Questioning, Teamwork/Working with others, Written Communication)
- **Personal Capabilities:** The ability and desire to learn for oneself and improve one's self-awareness and performance – lifelong learning philosophy, emotional intelligence and performance. To be a self starter and to finish the job (Achievement Orientation, Adaptability/Flexibility, Creativity, Decisiveness, Initiative, Leadership and tolerance of stress)
- **Technical Ability:** For example, having the knowledge and experience of working with relevant modern laboratory equipment. The ability to apply and exploit information technology (Technical Application, Technical Knowledge)
- **Business and/or Organisation Awareness:** Having an appreciation of how businesses operate through having had (preferably relevant) work experience. Appreciation of organisational culture, policies, and processes through organisational understanding and sensitivity. Ability to understand basic financial and commercial principles (Commercial Awareness, Financial Awareness, Organisation Understanding)
- **Practical Elements - Vocational Courses:** Critical evaluation of the outcomes of professional practice; reflect and review own practice; participate in and review quality control processes and risk management.

Kubler and Forbes (2005)

Discipline attributes can be mapped against generic attributes to create a 'map', which are different in size and terminology depending on the subject.

One example can be viewed on pp28-31 at:

http://www.heacademy.ac.uk/assets/York/documents/ourwork/tla/employability_enterprise/student_employability_profiles_apr07.pdf

There are supporting materials for use of the profiles for academics, students, prospective students and employers at each of the Subject Centre websites, hosted by the Higher Education Academy.

Beyond the national profiles, no HEIs appear to have created their own 'competency frameworks' for undergraduates across the board. Individual academic departments may have their own learning outcomes though the national profiles are often used. Several HE careers services and employability units have developed their own employability programmes with clear learning outcomes, but these vary on an institution by institution basis. There is no national employability or career development programme for undergraduates, although there is a careers education benchmarking statement (developed by the Association of Graduate Careers Advisory Services – AGCAS).

Returning to the Dublin Descriptors discussed earlier, there are of course descriptors for the first (Bachelors') and second (Masters') cycles.

Qualifications that signify completion of the first cycle are awarded to students who:

- have demonstrated knowledge and understanding in a field of study that builds upon and their general secondary education, and is typically at a level that, whilst supported by advanced textbooks, includes some aspects that will be informed by knowledge of the forefront of their field of study;
- can apply their knowledge and understanding in a manner that indicates a professional approach to their work or vocation, and have competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study;
- have the ability to gather and interpret relevant data (usually within their field of study) to inform judgements that include reflection on relevant social, scientific or ethical issues;
- can communicate information, ideas, problems and solutions to both specialist and non-specialist audiences;
- have developed those learning skills that are necessary for them to continue to undertake further study with a high degree of autonomy.

Qualifications that signify completion of the second cycle are awarded to students who:

- have demonstrated knowledge and understanding that is founded upon and extends and/or enhances that typically associated with Bachelor's level, and that provides a basis or opportunity for originality in developing and/or applying ideas, often within a research context;
- can apply their knowledge and understanding, and problem solving abilities in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study;

- have the ability to integrate knowledge and handle complexity, and formulate judgements with incomplete or limited information, but that include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgements;
- can communicate their conclusions, and the knowledge and rationale underpinning these, to specialist and non-specialist audiences clearly and unambiguously;
- have the learning skills to allow them to continue to study in a manner that may be largely self-directed or autonomous.

The Joint Quality Initiative working group also published a guideline to differentiate between cycles, which may serve as a useful measuring point for the creation of a researcher development framework:

Cycle	Knowledge and understanding:
1 (Bachelor)	[Is] supported by advanced text books [with] some aspects informed by knowledge at the forefront of their field of study ..
2 (Master)	provides a basis or opportunity for originality in developing or applying ideas often in a research* context ..
3 (Doctorate)	[includes] a systematic understanding of their field of study and mastery of the methods of research* associated with that field..

	Applying knowledge and understanding:
1 (Bachelor)	[through] devising and sustaining arguments
2 (Master)	[through] problem solving abilities [applied] in new or unfamiliar environments within broader (or multidisciplinary) contexts ..
3 (Doctorate)	[is demonstrated by the] ability to conceive, design, implement and adapt a substantial process of research* with scholarly integrity .. [is in the context of] a contribution that extends the frontier of knowledge by developing a substantial body of work some of which merits national or international refereed publication ..

	Making judgements:
1 (Bachelor)	[involves] gathering and interpreting relevant data ..
2 (Master)	[demonstrates] the ability to integrate knowledge and handle complexity, and formulate judgements with incomplete data ..
3 (Doctorate)	[requires being] capable of critical analysis, evaluation and synthesis of new and complex ideas..

	Communication
1 (Bachelor)	[of] information, ideas, problems and solutions ..
2 (Master)	[of] their conclusions and the underpinning knowledge and rationale (restricted scope) to specialist and non-specialist audiences (monologue) ..
3 (Doctorate)	with their peers, the larger scholarly community and with society in general (dialogue) about their areas of expertise (broad scope)..

	Learning skills ..
1 (Bachelor)	have developed those skills needed to study further with a high level of autonomy ..
2 (Master)	study in a manner that may be largely self-directed or autonomous..
3 (Doctorate)	expected to be able to promote, within academic and professional contexts, technological, social or cultural advancement ..

4. Conclusion

As expected, there are similarities between those competencies which have been identified as crucial to professional development and performance, regardless of sector or target audience. However, an understanding of the underpinning theories as well as the methodology used to develop each framework provides a deeper insight into the interpretation and usage of the competencies.

The difference in theories provides us with a choice when developing a framework for researchers – depending on the basis of the core objectives of the framework and its intended usage.

The researcher frameworks identified here may provide a good starting point for the development of the research-specific elements of the framework; it is useful to bear in mind the distinctions between types of researcher and researchers' views of their own work as identified in the initial review of literature conducted by Lee. We might also like to consider the distinctions in language and how these might impact the way in which 'core' and 'role-specific' competencies are described – how would an end-user make practical use of the framework?

Finally: one area which was not explored in this review was the impact and evaluation of the usage of competency frameworks. One might gain some insight when the longevity of the frameworks is discovered – for example, the Hay/McBer Framework (and the related competency dictionary) has been in existence for some decades, while there was evidence that there had been two iterations of the Government Research Profession framework in the last five years. We also know that the corporate framework which used 'core' and 'market' capabilities was developed in 1999; ten years later it is still the basis of professional development, appraisal and reward for one of the world's leading professional services firms.

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Appendix One: References for this report

- Advisory Council for Science Technology and Innovation RoI (2008), *Towards a Framework for Researcher Careers* (2008). Forfas on behalf of Advisory Council for Science Technology and Innovation.
- Archer, W. and Davidson, J. (2008) *Graduate Employability: What do employers think and want?* The Council for Industry and Higher Education.
- Becker, R. Evans, J. Leonard, D. and Metcalfe, J. (2006). *Review of the literature on the impact of working context and support on the postgraduate research student learning experience.* The Higher Education Academy.
- Charles Darwin University (Au) 2006, *Staff Competency Framework*
<http://www.cdu.edu.au/pmd/Workforce%20Development/CDUStaffCompetencyFramework17Oct2006.pdf>
- Chartered Institute of Personnel and Development (2009) *Learning and Development Annual Survey Report* CIPD
- Chartered Institute of Personnel and Development. (2009). *Recruitment, retention and turnover. Annual survey report 2009* CIPD
- Cheng, M. Dainty, A. R.J. and Moore, D. R. (2002). *Competence, competency and competencies: performance assessment in organisations.* Work Study. Vol. 51 (6) Emerald Group Publishing Ltd and MCB UP Limited: 314 – 319.
- Cheng, M. Dainty, A. R.J. and Moore, D. R. (2005). *Towards a multidimensional competency-based managerial performance framework, a hybrid approach.* Journal of Managerial Psychology. Vol. 20 (5) Emerald Group Publishing Ltd: 380 – 396.
- Department for Work and Pensions (2009) *Competency Framework for the Operational and Social Research Professions*
<http://research.dwp.gov.uk/working/applying/experience.asp>
- EEC (2003), *The History of HERA*
<http://www.hera.ac.uk/qfx/media/home/abouthera/thehistoryofhera.pdf>
- Ellstrom, P-E (1997) *The many meanings of occupational competence and qualification,* Journal of European Industrial Training, Vol. 21, Issue 6/7
- Economic and Social Research Council (2009) *Postgraduate Training Framework: A Strategy for Delivering Excellence.*
- European Framework for Work Experience (2005), *Employer Researcher Report,* Research Report on the Employer Perspective of Work Experience and Work-Related Skills, EFWE.
- Faculty of General Dental Practice (UK), The Royal College of Surgeons of England (2007) *Research Competencies Framework*
<http://www.fgdp.org.uk/pdf/competencies.pdf>

- Forbes, P. Kubler, B. and Rees, C. (2006). *Student employability profiles*. The Higher Education Academy.
- Garrick, L. (2006). Supporting Guide – Hay Group Inventory of Leadership Styles Diagnostic. *Report for Senior Careers Development Service*. HayGroup.
- Gläser, J. and Laudel, G. *Understanding the Academic Career*.
- Gray, A. and Metcalf, J. (2005). Employability and doctoral research postgraduates. *Learning and Employability Series Two*. The Higher Education Academy.
- Hansson, B. (2001). Competency models: are self-perceptions accurate enough? *Journal of European Industrial Training*. Vol. 25 (9) MCB University Press: 429 – 441.
- Harvey, L and Locke, W (2002) *Enhancing employability, recognising diversity* [online]. Available at www.universitiesUK.ac.uk/employability, Universities UK
- Hay Group (2009) *The Hay method of job evaluation* [online] available at www.wmin.ac.uk
- Hogg, C *et al* (2008) *Competency and competency frameworks factsheet*, Chartered Institute for Personnel and Development
- Jaeger, A. J. (2002). Emotional Intelligence. *Job Competencies and the Curriculum: An Inquiry into Emotional Intelligence in Graduate Professional Education*. US Department of Education.
- Joint Negotiating Committee for Higher Education Staff (2004) *Academic Role Profiles*
- Joint Quality Initiative Working Group (2004) *Shared 'Dublin' descriptors for Short Cycle, First Cycle, Second Cycle and Third Cycle Awards*
- Lee, A. (2009) *Initial survey of the literature relating to the skills, competences and attributes of researchers*. Vitae.
- Lucas, S. (2007) *Developing Competencies in University Education: Harmonising with Secondary Education and the labor market, from a Social Psychology view of Education*. *Electronic Journal of Research in Educational Psychology*, N11, 5(1), Pages 125 – 158.
- Mansfield, R. S. (2005). *Practical Questions in Building Competency Models*. [online]. Available at: www.workitech.com.
- Mitchell, A. (2009) *Demand-led research graduate transferable skills for small high technology companies*. University of Strathclyde
- Mumford, A. (1995). *Learning in Action. Industrial and Commercial Training*. Vol. 27 (8). MBC University Press: 36 – 40.
- Natural Environment Research Council (2008) *Merit Promotion Scheme*. Staff Notice

05/08 NERC

- Nixon, I. Penhall, S. and Settle, T. (2005). *Entrepreneurship Skills for Graduates, Final Report*. Higher Education Academy.
- Office of National Statistics Recruitment and Development Centre (2009) *Competency # Frameworks for Researchers and Statisticians*
- Quality Assurance Agency for Higher Education Scotland (2007) *Employability: Effective learning and employability*. The Quality Assurance Agency for Higher Education.
- Raven, J. (2001) *The McBer Competency Framework: Competence in the Learning Society* Chapter 9. Peter Lang, New York: 121 – 127.
- Raven, J. (2001) *The McClelland/McBer Competency Models: Competence in the Learning Society* Chapter 15. Peter Lang, New York: 225 – 236.
- Rowe, C. (1995) *Clarifying the use of competence and competency models in recruitment, assessment and staff development*. Industrial and Commercial Training. Vol. 27 (11). MCB University Press: 12 – 17.
- Spencer, L.M., McClelland, D.C. & Spencer, S.M. (1990) *Competency Assessment Methods: History and State of the Art*. Paper presented at the American Psychological Association Annual Conference, Boston, Mass.
- Spencer, L and Spencer, S (1993) *Competence at Work*, John Wiley and Sons
- Spencer, L and Spencer, S (1996) *McBer Scaled Competency Dictionary* Hay Acquisition Company Inc.
- Stanbury, D. (2006). *Careers Education Benchmark Statement*. AGCAS
- UK Civil Service (2009) *Government Social Research Profession Competency Framework*
http://www.civilservice.gov.uk/Assets/gsr_competencies_framework_tcm6-5929.pdf
- UK Commission for Employment and Skills (2009), *Ambition 2020: World Class Skills and Jobs for the UK: Key Findings and Implications for Action*.
- UK GRAD Programme (2001) *Joint Skills Statement of the UK Research Councils' Training Requirements for Research Students*. UK GRAD
- University of Bristol (2007) *Job evaluation scheme booklet*
- University of Cambridge (2008) *Higher Education Role Analysis (HERA) and Job Evaluation* [online]. Available at: <http://www.admin.cam.ac.uk/offices/hr/reward/hera.html>.
- University of Stirling (2009) *Researcher Development Framework*
<http://www.research.stir.ac.uk/supporting/infostaff/documents/ResearchFramework2009.pdf>

University of Surrey (2005) *Job Families and Competency Framework*

http://portal.surrey.ac.uk/pls/portal/docs/PAGE/HUMANRESOURCES/RP/UNIVERSITY_OF_SURREY_COMPETENCY_FRAMEWORK2.DOC

http://portal.surrey.ac.uk/portal/page?_pageid=712,313941&_dad=portal&_schema=PORTAL

Universities UK/Confederation of British Industry (2009) *Future Fit: preparing graduates for the world of work* CBI on Higher Education

Wallace, M. (2009). *Conceptual Framework for Researcher Development*. ESRC

Working group on employability (2009) *Report to Ministers*, Bologna Conference, Leuven.

Appendix Two: Keyword Search

Google and Google Scholar, ERIC, British Education Index and Emerald Insight were all searched as part of this review. Common keywords were used across all sites.

Results for some searches drew thousands of results; the first fifty were considered from Google/Google Scholar. Emerald Insight returned results were investigated more thoroughly with linked searches conducted once relevant publications were highlighted. ERIC and BEI returned fewest results.

Competence
Competency
Competency+framework

Graduate+competence
Graduate+competency
Graduate+competency+framework

Undergraduate+competency
Undergraduate+competency+framework

Employability
Employability+framework

Research+competence
Research+competency
Research+competency+framework

Researcher+competency
Researcher+competency+framework

Professional+competency
Professional+development+framework

Postgraduate+competency
Postgraduate+competency+framework