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Principal Investigators and Research Leaders Survey (PIRLS)

2011 UK aggregate results

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The Concordat
to Support the Career Development of Researchers

RESEARCH COUNCILS UK

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The CROS/PIRLS Steering Group exists to ensure the appropriateness and sustainability of PIRLS and its associated activities, ensuring that PIRLS meets the needs of the higher education sector in collecting principal investigators’ and research leaders’ views and in making these views available to the sector.

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Foreword

I am really pleased that the Principal Investigators and Research Leaders Survey (PIRLS) has been conducted for the first time.

The role of the principal investigator or research leader is a critical one, both for the future of research in the UK and for the experience of researchers.

PIRLS provides a rich dataset with important information on research leadership and the development of future research leaders. As the recommendations indicate, this information raises a number of significant issues for the sector, especially in relation to: clarifying the role and contribution of continuing professional development for research leaders, communicating human resources management procedures, addressing the low levels of satisfaction with work-life balance for some sub-groups of research leaders, and investigating reported inequalities between different sub-groups.

This report offers the initial analysis but there is clearly scope for more detailed work, and in particular for institutions to compare their own data with the national picture presented here. It will be enormously valuable if, as part of this process, institutions are able to identify good practice and to share it across the sector.

The Careers in Research Online Survey (CROS) has been an enormously valuable source of information on the experience of the UK researcher. I am confident that PIRLS will make the same contribution in relation to principal investigators and research leaders and I encourage more institutions to take part when PIRLS is next carried out in 2013.

Finally I offer my thanks to all those who have been involved with the considerable effort that has gone into conducting PIRLS, and especially to the research leaders who have taken the time to respond to the survey and hence to benefit themselves and their colleagues.

Dr Andrew Wilson
Loughborough University
Chair, CROS/PIRLS Steering Group

Executive summary

An introduction to the Principal Investigators and Research Leaders Survey

This publication reports on the findings from the Principal Investigators and Research Leaders Survey (PIRLS), conducted by higher education institutions (HEIs) in spring 2011. This new survey is designed to gather the anonymous views and experiences of research leaders in UK HEIs.

Thirty-three institutions participated in PIRLS 2011. The 2,588 completed responses represent a response rate of 19% for the target sample, which comprises approximately 40% of the estimated UK population of higher education research leaders. The response rate and statistical confidence afforded by the size of the sample suggest that the responses are representative of research leaders in UK higher education.

PIRLS offers a valuable snapshot of the attitudes of the UK's research leaders in higher education in 2011, in terms of their perceived capabilities, the support available to them and their views of what is important in developing future research leaders. As many research leaders are responsible for and manage research staff, the results also provide the opportunity for comparison with the results of the Careers in Research Online Survey (CROS) 2011 and a view of progress by institutions of the implementation of the principles of the Concordat to Support the Career Development of Researchers.

Key findings

Confidence in responsibilities

In terms of the wide range of activities undertaken by principal investigators and research leaders, not unexpectedly, respondents had the greatest overall confidence in directly research-related activities. Fewer were confident in their management and leadership of people and a significant proportion would like to have more confidence in performance management, employment conditions and the application and impact of research.

A substantial majority (two thirds to three quarters) have confidence in activities they undertake as leader of a research group, such as building the group and motivating the researchers, but there is less widespread confidence in management activities such as budget, performance and human resource-related management.

Around half of research leaders are confident in relation to demonstrating research impact, public engagement, knowledge exchange and collaborations outside higher education.

There were positive views of the support available to them, institutionally or through colleagues, to enhance their capabilities for every activity investigated. The extent of their satisfaction broadly correlated with their level of confidence.

Importance of activities for future research leaders

The levels of importance attributed to different activities, in relation to becoming a research leader in the future, varied markedly. Primary activities in research, such as developing a research area, preparing proposals, securing funding and maximising research outputs, were almost universally considered to be critically important. The majority also saw leadership activities, such as building a group and supervision of postgraduate researchers, to be very important.

Most considered activities such as public engagement, demonstrating impact and knowledge exchange to be quite, rather than very, important. Budget management and employment-related management functions were seen by few as very important and significant proportions (20-30%) saw them as unimportant activities for researchers to develop on their path to research leadership.

Participation in continuing professional development was seen as least important for future researchers and a fifth of research leaders did not consider it relevant.

Recognition and value

Appraisal/review of research leaders is widespread (over 80% within the last two years), notably more so than is the case for research staff, and the usefulness of appraisals is regarded as broadly positive. Most research leaders feel recognised for the range of contributions they make to their institutions.

Whereas the majority of research leaders are satisfied with their work-life balance, this is less positively viewed than by research staff. Those in middle age (41-55 years) are less satisfied than those younger or older, as is generally the case in all employment sectors. Female research leaders over 40 years old stand out as the only group with more respondents dissatisfied with their work-life balance than are satisfied.

Equality and diversity

Although the large majority of research leaders, overall, believe that their institutions are committed to diversity and equality, a significant proportion of female research leaders perceive a lack of fairness of treatment in relation to promotion, reward and participation in decision-making. In contrast to less than a tenth of male respondents, a quarter of female respondents reported that they had been discriminated against in their current role; this increased to up to 30% for female research leaders over 40 years old.

Overall, PIRLS 2011 has engaged a significant number of institutions and research leaders, whose responses constitute a useful baseline view of attitudes to their leadership and management activities and their support of other researchers. It provides a new perspective of progress on implementation of the Concordat and increased institutional participation in PIRLS 2013 will provide a valuable opportunity to measure further progress.

PIRLS 2011 gives a valuable insight into the views and experiences of this critically important group within UK higher education and raises a number of significant challenges for the sector, reflected in the recommendations below. The drive towards research outputs is reflected in the priorities and confidence levels of research leaders and their lower engagement in wider professional development, including outward-facing activities such as knowledge exchange and public engagement. Activities relating to human resource management and development, including appraisal and performance management, are also perceived as much less important. Although research leaders generally feel valued by the institution, there is a need to address the low levels of satisfaction with work-life balance and perceived discrimination for significant sub-populations.

Recommendations

For principal investigators and research leaders

- Research leaders are encouraged to become more informed about and to participate in professional development activities in areas where they feel less confident, for their own benefit and also to enable them to support better the leadership development of research staff
- Principal investigators and research leaders should ensure that their research staff have the opportunity and are encouraged to participate in an effective appraisal

For institutions

- Institutions should explore ways to effectively communicate policies and procedures relating to human resource management and the employment of staff, and highlight their relevance to principal investigators and research leaders
- Institutions and research funders should consider how to remove obstacles and provide more positive drivers, including workload allocation models, to enable research leaders, and research staff, to engage more effectively in outward-facing activities
- Institutions should explore ways to provide and encourage research leaders to engage in effective development activities to increase their confidence in:
  - developing proposals and securing research funding
  - financial and budgetary management
  - performance management and effective appraisals
  - demonstrating impact, knowledge exchange and public engagement
- Institutions should review policies and processes, including working conditions, to guard against inequalities between different sub-populations of research leaders, particularly in relation to progression, reward and participation in institutional and departmental decision-making
- Institutions should seek to identify any sub-populations of research leaders who are less satisfied with the balance of their life and work, and work with them to develop strategies to improve this
- Institutions are encouraged to review their institutional free-text responses to PIRLS relating to equality and diversity, and explore in more detail issues around perceived discrimination or unfair treatment, especially in relation to gender
- Participating institutions are encouraged to compare their own PIRLS data with the UK aggregate and benchmarking results, taking into account local factors, and to provide feedback to their research leaders and others
- Participating institutions are encouraged to consider their data alongside their CROS results, and together with their Concordat implementation plans
- All institutions are encouraged to participate in PIRLS in the future as an effective tool to explore research leaders' views and experiences and to support the development of research leaders in relation to the principles of the Concordat

For UK organisations

- The Concordat Strategy Group is encouraged to consider continuation of support for the development, implementation and analysis of PIRLS, alongside CROS, as the UK benchmark of research leaders' views and experiences in relation to implementation of the principles of the Concordat
- The CROS/PIRLS Steering Group should explore how PIRLS can be enhanced further by seeking feedback from institutions and reflecting on the experience of conducting PIRLS 2011
- The CROS/PIRLS Steering Group should explore whether PIRLS could be used for further investigation to understand better research leaders' perceptions of continuing professional development and their needs in relation to participation in personal and career development

1 Introduction

This report presents findings from the 2011 Principal Investigators and Research Leaders Survey (PIRLS). This new web-based survey is designed to gather the anonymous views of principal investigators (PIs) and research leaders in UK higher education institutions (HEIs) concerning their activities and attitudes in relation to research leadership and the management of research staff and supervision of postgraduate researchers. It aims to capture respondents' views on the capabilities that make them research leaders and how these capabilities may be developed in research staff as they seek to become the research leaders of the future.

The findings are based on the aggregate results from a common PIRLS question set conducted by 33 institutions between May and June 2011. This report provides the aggregate view of the activities and attitudes of research leaders, which can be used as a UK context against which individual institutions can compare their PIRLS results.

In presenting the results and findings, comparisons are made where appropriate with selected results from the contemporaneous Careers in Research Online Survey (CROS) 2011[1], and other relevant UK information where available.

The full set of aggregate results is given in Appendix 1.

2 Context

The importance of research innovation and a highly-skilled research workforce has repeatedly been articulated in the policy of recent governments as key elements of strategy to support the future economic prosperity and well-being of the UK. This underpins the Science and Innovation Investment Framework and was recently highlighted in the 2011 Higher Education White Paper[2].

Optimising the economic and societal impact of research is also the goal of Higher Education Funding Council for England (HEFCE) Higher Education Innovation Fund (HEIF)[3] and other funding councils' 'third stream' funding. Increasingly it is recognised that obtaining greater impact from research requires investment in good leadership and management and in the development of researchers, as well as effective knowledge exchange with businesses and others dependent on the research base.

Announcing the institutions gaining the HR Excellence in Research award, David Willetts, Minister for Universities and Science said "It is right that as we put research at the heart of our plans for future prosperity, we prioritise the development of excellent researchers able to capitalise on the impact of that research."

The HEFCE 2010 overview[4] of the higher education workforce in England identified some of the challenges and conditions for achieving a healthy and sustainable workforce:

"It is essential that universities and colleges are able to attract, retain and motivate talented staff if they are to remain successful within a changing national and global higher education environment. Staff in higher education must continue to adapt and change in response to the new expectations placed on them if we are to maintain the highest quality of higher education and research."

Sir Alan Langlands, Chief Executive, HEFCE

Several contributors to the HEFCE 2010 report recommended that institutions should develop clearer frameworks and processes for performance review and development:

"Those staff tasked with the performance management of others should receive appropriate guidance and be assured of the institution's full support as they carry out their managerial function."

The report also identified staff well-being as an emerging area of interest and practice across the sector:

"Delivering improved staff health, engagement and support through well-being programmes can help individuals to remain motivated and committed, responding creatively and flexibly, and performing to the best of their abilities. It should also help HE employers to achieve a more resilient and engaged workforce for the future."

A report for HEFCE in 2005[5] identified that human resource management practised by research leaders within institutions varied greatly, with patches of excellence but inconsistency. It suggested that some research leaders' drive to pursue research goals was at the expense of the management of the research staff for whom they had responsibility.

The appraisal/review of research staff was highlighted as a resulting issue of concern. Amongst the report's recommendations were that research leaders and higher education human resources and staff developers needed to co-educate each other, and that stakeholders such as research funders might beneficially encourage or facilitate such progress.

[1] 'Careers in Research Online Survey (CROS) 2009: Analysis of aggregated UK results'. Vitae

[2] Higher Education White Paper: Students at the Heart of the System, BIS, 2011 www.bis.gov.uk/assets/biscore/higher-education/docs/h/11-944-higher-education-students-at-heart-of-system.pdf

[3] Higher Education Innovation Fund: www.hefce.ac.uk/econsoc/buscom/heif/heif.asp

[4] The higher education workforce framework, 2010, HEFCE 2010/05

[5] 'Researchers in higher education institutions: scoping study of career development and human resource management', HEFCE, 2005

A Leadership Foundation for Higher Education (LFHE) report in 2007 on human resources management identified the challenge associated with developing and embedding effective performance management in higher education:

'HEIs have faced difficulties implementing successful approaches to performance management due to a combination of cultural resistance and a misunderstanding of the role and value of performance management in higher education. This active resistance and lack of belief in the value of practices, such as appraisal and performance review, has resulted in an implementation gap, as new systems and approaches are not prioritised or are carried out in a ritualistic and ineffective way.'

This was reinforced in a 2009 report to HEFCE on the impact of policy and investment in human resources management, which indicated that although managing performance in relation to institutional strategies had improved over the previous ten years, it still remained a priority area for human resources directors.

The introduction of new duties under the Equality Act 2010[6] reinforces the importance of institutions promoting equality of opportunity for all researchers. As an HEFCE workshop on equality and diversity in research careers[7] identified, 'making progress on equality and diversity in research careers is increasingly important if the country is to benefit from the endeavours of the pool of talented and committed researchers we have in our higher education (HE) sector'.

The importance of investment and development of human resources for all staff is formally recognised within the Research Excellence Framework[8] which assesses the quality of research in UK higher education institutions. Draft panel guidance on the research environment element of the Research Excellence Framework makes explicit references to evidence and indicators of the implementation of the Concordat to Support the Career Development of Researchers and 'how the unit [of assessment] has been developing the research of early career researchers and support for integrating them into a wider, supportive research culture'.

2.1 The Concordat to Support the Career Development of Researchers

The Concordat to Support the Career Development of Researchers was launched in June 2008, signed by Universities UK and the main research funders, and supported by a range of interested stakeholders. It incorporates a set of principles to enhance the attractiveness and sustainability of research careers.

The Concordat recognises that research leaders play a key role in leading and managing research staff within universities and research institutes. It encourages research managers to 'participate in active performance management, including career development guidance' and 'actively encourage researchers to undertake continuing professional development'.

The Concordat stresses 'that developmental activity can often have a direct impact on the success of the project, by distributing work, taking advantage of individual strengths and talents, and increasing the skill and effectiveness of researchers in key areas such as writing for publication or communicating with a wider audience. Funding bodies acknowledge that the training of researchers is a significant contribution to research output and they encourage employers and mentors to adopt these practices'.

The Concordat is having a significant influence and impact across the higher education sector. A survey of institutional strategies in spring 2010[9] showed that 70% of institutions had implemented changes to their policies and procedures, many had a specific implementation plan and more were in the process of producing such a plan. 81% of all institutions reported that their governing body was kept regularly informed about and involved in Concordat implementation.

The Concordat recognises that benchmarking and regular review of progress is required in order to assess impact and effectiveness. The alignment of CROS in 2009 with the Concordat principles provided an important mechanism in reviewing progress based on the views and experiences of research staff. In parallel, PIRLS provides a perspective from research leaders who are central to the implementation of the management and employment procedures that institutions are seeking to deploy in response to the Concordat. Together with a number of other initiatives, CROS and PIRLS provide important measures of progress in the implementation of the Concordat.

The Concordat is also the mechanism through which UK institutions can demonstrate alignment with the principles of the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers. A UK-wide process, incorporating both the QAA Code of Practice for Research Degree Programmes and the Concordat to Support the Career Development of Researchers, enables institutions that have published Concordat implementation plans to gain the 'HR Excellence in Research' badge[10]. UK institutions lead the way in Europe in gaining the award.

[6] 'Equality Act 2010 implications for higher education institutions', ECU, 2010 www.ecu.ac.uk/publications/equality-act-2010
[7] Workshop on equality and diversity in research careers, HEFCE, 2010 www.hefce.ac.uk/research/careers/event_notes.pdf
[8] Research Excellence Framework www.hefce.ac.uk/research/ref/

The Concordat to Support the Career Development of Researchers embodies seven key principles:

1. Recognition of the importance of recruiting, selecting and retaining researchers with the highest potential to achieve excellence in research.
2. Researchers are recognised and valued by their employing organisation as an essential part of their organisation's human resources and a key component of their overall strategy to develop and deliver world-class research.
3. Researchers are equipped and supported to be adaptable and flexible in an increasingly diverse, mobile, global research environment.
4. The importance of researchers' personal and career development, and lifelong learning, is clearly recognised and promoted at all stages of their career.
5. Individual researchers share the responsibility for and need to pro-actively engage in their own personal and career development, and lifelong learning.
6. Diversity and equality must be promoted in all aspects of the recruitment and career management of researchers.
7. The sector and all stakeholders will undertake regular and collective review of their progress in strengthening the attractiveness and sustainability of research careers in the UK.

2.2 Vitae

Research Councils UK funds the Vitae programme, launched in 2008 and managed by CRAC. Its vision is for the UK to be world-class in supporting the personal, professional and career development of researchers; its four overarching aims are to:

- build human capital by influencing the development and implementation of effective policy relating to researcher development
- enhance higher education provision to train and develop researchers through generation of key resources/programmes and regional implementation
- empower researchers to make an impact in their careers through UK-wide researcher web resources and support and targeted activities to meet specific needs
- evidence the impact of professional and career development support for researchers.

From April 2011, Vitae assumed responsibilities for the implementation of the Concordat alongside its researcher development activities. During 2011, Vitae will undertake a three-year review of progress in implementation of the principles of the Concordat; the results of both CROS and PIRLS will form important inputs to this review.

Vitae has supported the redevelopment and management of CROS since 2008, and more recently the development of PIRLS, with the Concordat Implementation Coordinator. In addition to providing managerial and financial support to the CROS/PIRLS Steering Group, Vitae analyses and publishes the UK aggregate results of both CROS and PIRLS. (Appendix 2)

Vitae also hosts the 'Leadership development for principal investigators' web pages providing online resources for new and aspiring principal investigators. This was the outcome from the second stage of a HEFCE Leadership, Governance and Management funded project[12].

2.3 Development of PIRLS

In 2005 an online Research Leaders Survey, under the auspices of CROS, was funded by HEFCE and piloted by 15 universities. This aimed to establish baseline data on research leaders' experiences of managing and leading the research process, and a preliminary analysis of aggregate results was produced[13].

The Concordat Strategy Group recognised that many in the higher education sector see the engagement of principal investigators as key to the successful implementation of the Concordat principles. As part of the benchmarking exercise for the Concordat, one project was to explore the views and perceptions of principal investigators and identify a benchmark against which to measure the extent of the cultural change that needs to happen within the sector to truly achieve the aims of the Concordat.

In 2010 the Concordat Strategy Group agreed to fund a project with the CROS/PIRLS Steering Group to redevelop the Research Leaders Survey, which was developed and piloted by 15 universities as part of the Establishing and Meeting the Leadership and Development Needs of Principal Investigators project.

The CROS/PIRLS Steering Group and Vitae agreed to work with the Concordat Implementation Coordinator to develop PIRLS from the 2005 survey. This included workshops at the Vitae Conference and Policy Fora, focus groups/interviews with principal investigators, input from a range of stakeholders and trials of the question set with principal investigators.

PIRLS has been developed along the lines of CROS with the ability for institutions to compare their results confidentially with the UK aggregate of all participating institutions and benchmarking groups of institutions. Similarly it has the potential to track changes over time by comparison of results of successive surveys.

[9] Higher education institutions' strategic responses to the Concordat, London, 2010

[10] HR Excellence in Research badge www.vitae.ac.uk/hrexcellencebadge

[11] www.vitae.ac.uk/pi

[12] Establishing and Meeting the Leadership and Development Needs of Principal Investigators. This stage of the project was led by the University of Nottingham with input from seven institutions, Vitae, Research Councils UK, Leadership Foundation for Higher Education, Association of Research Managers and Administrators and Universities UK.

[13] Careers in Research Online Survey for Research Leaders 2005-6: preliminary analysis of aggregate results from all participating institutions, Vitae www.vitae.ac.uk/cros

3 Implementation of PIRLS 2011

3.1 Target audience

PIRLS is targeted at staff employed in UK higher education institutions who act as principal investigators and research leaders. The invitation to participate in the survey suggested:

'[PIRLS] should be completed if you are principally responsible for setting the intellectual direction of the research and are also personally responsible for the management/supervision of research staff and/or postgraduate researchers'.

The intended participants are therefore defined by their role in relation to both research and their responsibility for other researchers. It is expected that respondents encompass professors, lecturers and other HEI staff who have research and teaching roles, as well as research-only staff with management responsibility for other researchers.

Individual institutions were responsible for identifying their respective target sample and for promoting the survey to potential participants.

3.2 Methodology

PIRLS comprised a series of parallel surveys conducted by individual institutions, all hosted on the Bristol Online Surveys (BOS) platform, using methodology developed and used for CROS. The BOS platform provides a secure web environment for the design, delivery, administration and analysis of online surveys. Institutions' individual surveys used a common core question set, to which they could add bespoke questions for their own participants if desired. Linkage of the survey responses through the BOS tool enabled collation of the results of all the surveys for core questions on a confidential basis, to protect the anonymity of individual respondents and their institutions. The free-text responses to open-ended questions remained confidential to the respective institutions.

The core question set for the survey was developed by the Concordat Implementation Coordinator under the guidance of the CROS/PIRLS Steering Group and with input from the higher education sector at the Vitae Conference and Policy Forum. The survey is structured into five sections:

A. Your experience as a principal investigator/research leader (questions 1-4)

B. Support for your role as principal investigator/research leader (questions 5-14)

C. Preparing the research leaders of tomorrow (questions 15-16)

D. Equality and diversity (questions 17-21)

E. About you (questions 18-26)

The full question set is given in Appendix 1. All quantitative questions in the survey were compulsory, except where subsets of respondents were invited to respond. All open-ended questions were voluntary.

Administrative and technical support for the implementation of the survey was provided by the Institute for Learning and Research Technology (ILRT) at the University of Bristol.

The costs for developing and administering PIRLS, and the analysis of the results, were provided from the Concordat implementation budget. Vitae provided administrative support and resources for the CROS/PIRLS Steering Group and has conducted the analysis and prepared this publication, on behalf of and with the guidance of the Steering Group.

3.3 Report aims and structure

The responses from PIRLS 2011 comprise a novel and potentially rich dataset which is worthy of sustained analysis. The CROS and PIRLS Steering Group agreed that the primary analysis of the data should be to provide overall aggregate results and findings for the UK higher education sector, highlighting results for selected sub-populations or groups where distinctive findings emerge. There is likely to be potential for further analysis of the dataset as the findings are considered by different audiences.

Given the varied environments, infrastructure and practice to support research and those leading it within individual universities, responses from a particular HEI cohort may well differ markedly from the aggregate responses reported here. Institutions are therefore encouraged to analyse and use their own data to record and report the position for their own staff, and to consider benchmarking results through the BOS tool against other groups of institutions and the aggregate UK results reported here.

4 Participation and response sample characteristics

This section summarises the extent and nature of participation in PIRLS 2011, including characteristics of the overall sample of respondents. How this represents and compares with the overall population of principal investigators and research leaders in UK HE is difficult to assess, as they are not recorded as a grouping within the Higher Education Statistics Agency (HESA)[14] staff record data. Some comparisons are made with findings of other investigations, including a UK survey of research leaders conducted in 2005-06.

4.1 Participation in the survey

This report is based on the participation of the 33 institutions that had completed PIRLS by 30 June 2011. A small number of institutions kept their surveys open beyond this date: their data are not included in the aggregate results.

At the time of the survey closure, 3,262 responses had been received from participants. After removal of duplicate and incomplete responses, 2,588 completed responses remained, providing the final dataset for analysis. Approximately 500 of the 674 incomplete responses did not continue the survey beyond the end of Section 1 of the questionnaire.

Individual institutions identified their respective principal investigator/research leader populations and reported these target populations in BOS. These were compared with the HESA staff record data[15] and an overall target population of just over 14,000 estimated for the 33 participating institutions. Based on this estimate, 2,588 completed responses represented an overall response rate of 18.5% within the participating institutions.

The 33 participating institutions comprised eight Russell Group[16] institutions, eight 1994 Group[17] institutions and 17 other institutions, including both pre-1992 and post-1992 institutions. Russell Group institutions provided just over half of the total responses (Table 1). Based on the revised target sample sizes, the response rate at 18-19% was very similar within each of the institutional groups.

Table 1 Participation in PIRLS 2011 by institutional group

	Institutions	Total responses	% of responses
Russell Group institutions	8 (of 20)	1,323	51
1994 Group institutions	10 (of 18)	458	18
Other institutions	17	807	31
Total	33	2,588	100

4.2 Profile of respondents

4.2.1 Demographic characteristics

Personal characteristics of respondents were compared with the HESA staff record data for academic staff and research staff responding to CROS 2011. The primary characteristics are summarised in Table 2.

Table 2 Demographic characteristics of respondents compared with known parameters of UK academic staff (HESA 2009-10) and research staff (CROS 2011)

	PIRLS 2011 %	HESA 2009-10 %	CROS 2011 %
Age (yrs)			
35 & under	1	28	56
36-45	35	28	26
46-55	35	25	12
Over 55	21	18	4
Gender			
female	33	39*	53
male	67	61	47
Ethnicity (UK)			
White (all)	93**	93	93
Mixed (all)	2	–	1
Asian (all)	2	3	2
Black (all)	<0.5	1	<1
Chinese	2	1	2
Other	2	2	1
Nationality			
UK	81	80	67
Other EU	13	10	19
Rest of world	7	10	14

Notes:

* Gender proportion for 'teaching and research' academic staff

** Ethnicity percentages are for UK nationals of known ethnicity only, with corresponding HESA data for academic staff (which combine 'mixed' and 'other')

The majority of respondents were aged 36 to 55 years, with the modal ages 41-45 and 46-50 years, each almost 19%. Only 1% of respondents were aged 30 years or younger. This was an older profile than UK academic staff recorded in the HESA data. Not unexpectedly, both populations were considerably older than research staff respondents to CROS 2011. However, respondents to PIRLS 2011 had a very similar age profile to respondents to the Research Leaders survey 2005-06[18].

[14] www.hesa.ac.uk

[15] Staff in Higher Education Institutions 2009-10, HESA. PIRLS sample is compared with 'academic professionals'. This includes academic staff classified as 'research only', 'teaching and research', 'teaching'

[16] Russell Group www.russellgroup.ac.uk

[17] 1994 Group www.1994group.ac.uk

[18] 'Careers in Research Online Survey for Research Leaders 2005-06: preliminary analysis of aggregate results from all participating institutions', Vitae

One third of PIRLS respondents were female, significantly lower than the proportion of female research staff, which is close to parity with males in CROS and HESA. Recent HESA staff data record that 44% of all academic staff are female. In the Research Leaders Survey 2005-06, 30% of respondents were female.

When respondents' age and gender were analysed together (Figure 1), the proportion of female respondents was 30-35% in every age range, decreasing slightly with increasing age, except in the range 31-35 years, where females made up 43% of respondents, and over 60 years, where only 20% of respondents were female.

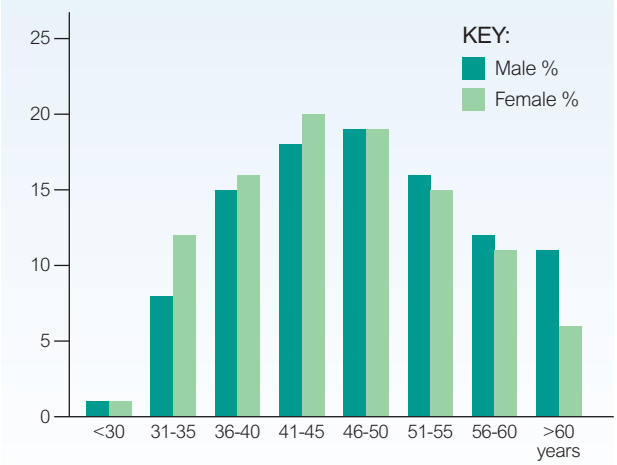

Figure 1 Age profile or respondents by gender (%)

In terms of nationality, over 80% of respondents were UK nationals, with 13% from other EU states and 7% from the rest of the world. A slightly lower proportion of UK national respondents were female, compared with those of other nationality. Within CROS 2011, around two thirds of respondents were of UK nationality, while HESA reports that around 80% of academic staff are UK nationals.

Investigating the ethnicity of UK nationals, identified by 95% of respondents, 93% were of white ethnicity (86% white British), and 2% or less were from any single other main ethnic minority grouping. These figures compare well with the proportion of ethnic minority background within UK higher education academic staff of 7% overall recorded in the HESA data, and with CROS 2011. Although analysis is limited by the small number of respondents of ethnic minority background, women were under-represented in all ethnic minority groups, except for those of Asian background.

Less than 5% of respondents declared some form of disability, of whom almost half identified this to be a long-standing illness or health condition. HESA reports that 2.5% of UK academic staff, and around 2% of research-only staff, are declared disabled. The reason for this difference is uncertain. It could be that respondents feel more able to report disability in an anonymous survey than to declare it formally to their employer, or it could be that research leaders are proportionally older than academic staff overall, which might result in a higher incidence of disability.

4.2.2 Field of research, experience and responsibility

Respondents identified their current research specialism within JACS subject groups[19], which were aggregated into broad subject groupings for analysis (Table 3).

This shows a broadly similar distribution with that obtained for research staff in CROS 2011, although with a lower representation for biological sciences, which has been noted as unexpectedly high in CROS. There is also broad agreement with the distribution of respondents' subjects in the Research Leaders Survey 2005-06, although that used several different subject categories, so reducing comparability.

Table 4 shows that just over half (51%) of respondents had been a principal investigator or research leader for ten or more years in total, while 13% had less than three years' experience. Over a third had been with their current institution for ten or more years. This was broadly similar to the pattern obtained in the Research Leaders Survey 2005-06.

Table 3 Respondents by broad subject group compared with results from the Research Leaders Survey 2005-06 (RL), CROS 2011 and HESA 2008-09 data for academic staff

	PIRLS 2011 %	RL 2005-06 %	CROS 2011 %	HESA 2008-09 %
Medical and biomedical sciences	22	29	21	22
Biological sciences	19	14	28	17
Physical sciences and engineering of which:	33	32	33	24
Physical sciences	14	23	13	10
Engineering and technology	13	9	14	8
Mathematics and computing	7		6	6
Social sciences	15	16	13	18
Arts and humanities	8	7	5	15
Education	3	2	2	5
Total	100	100	100	100

[19] Joint Academic Coding System (JACS) www.hesa.ac.uk/index.php?option=com_content&task=view&id=158&Itemid=233

Table 4 Respondents' length of experience in total and in their current institution

Years of experience	Total %	In current HEI %
Less than 3	13	20
3-5	18	25
6-9	18	20
10 or more	51	35

A higher proportion of male respondents (56%) had ten or more years of experience, compared with female respondents (42%). The proportion of male respondents with over ten years' experience at their current institution (39%) was also higher than that of female respondents (27%).

There was a wide variation in the number of postgraduate researchers and research staff for whom respondents were responsible (Table 5). Only 10% of respondents were not currently supervising postgraduate researchers, but just over a quarter had no current responsibility for research staff and a further quarter responsibility for only one member of research staff. The majority of respondents were not responsible for other academic staff (71%) or technical/support staff (59%). Compared with respondents to the Research Leaders Survey 2005-06, PIRLS respondents tend to have more responsibility for postgraduate researchers, but a higher proportion has responsibility for only one or no research staff.

By gender, there was little difference in the proportions supervising different numbers of postgraduate researchers or responsible for research staff, although the proportion of female respondents with responsibility for one or no research staff was somewhat higher (54%) than that of males (48%).

When analysed by broad subject group, significant differences in responsibility profiles were obtained. In terms of supervising postgraduate researchers, 14% of physical sciences respondents supervised no or just one postgraduate researcher compared to 22% overall. Biological science respondents displayed a somewhat similar trend, but with many respondents supervising between one and three postgraduate researchers. On the other hand, many more arts and humanities respondents (34%) than overall, and to a lesser extent more social sciences respondents, supervised no or just one postgraduate researcher. It also appeared that supervision of seven or more postgraduate researchers was more common for physical sciences respondents than in any other area.

The trend was more pronounced in relation to responsibility for research staff. In this case the profile for physical and biological sciences respondents was close to the overall profile. However, 70% of arts and humanities respondents and 65% in social sciences had responsibility for no or one member of research staff, compared with 51% overall and 37% of those in medical and biomedical sciences. In fact 45% in arts and humanities and 37% in social sciences had no research staff responsibilities at all, compared with 26% overall and 17% in medical and biomedical sciences.

This seems to suggest that a greater proportion of research leaders in the arts and humanities, especially, and the social sciences are 'singleton' researchers, i.e. without responsibility for any research staff, whereas larger research groups are most prominent in medical and biomedical sciences.

The significant differences in responsibility for research staff by broad subject groupings are particularly pertinent in this study, where respondents were specifically asked certain questions in relation to management activities/functions and the development of research staff.

Table 5 Respondents' responsibilities for postgraduate researchers and research staff by broad subject groups

	None	1	2-3	4-6	7-10	11+	N
Postgraduate researchers	%	%	%	%	%	%	
All respondents	10	12	36	28	10	5	2588
Physical sciences (incl. engineering/technology)	5	9	37	31	12	6	879
Biological sciences	7	18	42	25	5	3	498
Medical and biomedical sciences	10	12	35	29	10	4	571
Social sciences	16	12	32	26	9	5	386
Arts and humanities	22	12	30	22	8	5	205
Research staff							
All respondents	26	25	30	13	4	4	2588
Physical sciences (incl. engineering/technology)	23	27	33	11	3	3	879
Biological sciences	24	24	31	14	4	3	498
Medical and biomedical sciences	17	20	32	19	6	7	571
Social sciences	37	28	22	9	3	2	386
Arts and humanities	45	25	21	5	1	3	205

4.2.3 Summary of the profile of research leaders

Overall the sample of respondents displays the following characteristics:

- two thirds male
- 70% aged 36-55 years, with very few aged 35 or under
- 81% British, with 7% of ethnic minority background, and 13% from other EU nations
- over half with at least ten years' total experience as a research leader
- over one third with at least ten years as a research leader in their current institution
- 74% with responsibility for one or more members of research staff, falling to 21% with responsibility for more than three
- 90% supervise postgraduate researchers, of whom 43% supervise more than three.

4.3 Representativeness of the sample

Statistically, for a random sample of known size from a known total population, the confidence interval (effectively the error bar) can be calculated to a certain level of confidence. Typically, statistical analysis is conducted on the basis of a 95% confidence level. On this basis, 2,588 PIRLS responses from a target population of 14,000 principal investigators and research leaders produce a confidence interval of under 2%. This relatively small confidence interval suggests that the responses are representative of the population sampled, were this to be a random sample in the participating institutions. In turn, the 33 participating institutions collectively employ approximately 40% of the estimated total national population of research leaders, reflecting that many of the participating institutions were large, research-intensive institutions.

In many studies, a separate indication of confidence in how well respondents collectively represent the wider target population sampled is gained by comparing the demographic profile of respondents with that of the known total target population. The challenge for PIRLS is that principal investigators and research leaders are not recognised in HESA staff records or other UK sources of information as a discrete sub-population, so there is no readily available UK dataset against which to compare PIRLS respondents' characteristics.

While respondents' proportions in relation to ethnic minority background and disability seem to match those of UK academic professionals in total within HESA, there is not a good match in relation to age, gender or subject to any reported subset of HEI academic staff. Therefore these comparisons do not provide any supporting evidence that PIRLS respondents represent the broader UK population of principal investigators and research leaders.

Nevertheless, neither does it demonstrate that the PIRLS sample is not representative, but purely reflects that principal investigators and research leaders are not established as a discrete sub-population with a known demographic profile. Individual institutions will no doubt encounter similar difficulties in assessing how representative their PIRLS respondents are compared with their total population of principal investigators and research leaders. As more institutions participate in PIRLS, and with increasing response rates, it will be possible to build a better picture of the characteristics of principal investigators and research leaders.

It is possible to compare PIRLS respondents' characteristics with results of certain other surveys. For example, in an Athena survey of academic staff in Science, Technology, Engineering and Maths (STEM) subjects[20] (with 4,500 responses), 31% of respondents were female, which was similar to the picture in PIRLS, while their age distribution was between those displayed by respondents to PIRLS 2011 and academic staff proportions according to HESA, as shown in Table 2.

[20] ASSET 2010: Athena Survey of Science, Engineering and Technology www.athenasurvey.org.uk

5 Results

This section presents the main aggregated results for PIRLS 2011. This includes research leaders' confidence across a range of activities and their satisfaction with the support available, how recognised and valued they feel and their views on their work-life balance. It also reports research leaders' views on how important various activities are in preparing future research leaders. Some results are examined further for selected sub-populations of respondents, including by age, gender and discipline. The full aggregate results for PIRLS 2011 are presented in Appendix 1.

5.1 Principal investigators' and research leaders' activities

Respondents to the survey were asked to consider the extent to which they were confident in their ability in a range of areas of research experience and skills. For each area, they were also asked whether they were satisfied with the range and quality of development activities available, both informal and formal, and the support available to them from colleagues and mentors.

5.1.1 Research experience and skills

At 94% almost all respondents reported most confidence in presenting at conferences (Table 6). Over three quarters of respondents reported confidence in activities including developing a research area (81%), good research conduct (80%), academic collaborations (78%) and leading their research team (76%). Just over two thirds were confident in their activities to maximise research outputs (69%) and in preparing research proposals (67%).

Around 70% of respondents were satisfied with the development activities and support available in each of these areas; notably higher for research conduct (80%) and presentations (81%).

Almost a third of respondents reported that they would like to be more confident in maximising their research outputs (30%) and preparing research proposals (32%), corresponding with a lower expression of satisfaction with support.

Research-related experiences and activities where respondents reported less confidence are summarised in Table 7. Less than half of respondents were confident in securing research funding (40%), knowledge exchange (46%), public engagement (47%) and collaborations outside academia (47%). Similar proportions expressed a desire to be more confident in these areas. Only between 6-8% of respondents reported that these outward-facing activities were not relevant to them. Satisfaction with support was reported by between 50-55% of respondents for these activities.

Table 6 Research-related experiences and activities where more than two thirds of respondents reported confidence

	Confident %	Would like to be more confident %	Not relevant %	Satisfied with support %
Presenting at conferences	94	5	1	81
Developing a research area/programme	81	18	1	70
Good research conduct (ethics, IP etc)	80	17	3	80
Academic collaborations	78	21	1	70
Leading your research team	76	21	3	73
Maximising research outputs	69	30	1	68
Planning/preparing research proposals	67	32	<1	66

Table 7 Research-related experiences and activities where respondents reported least confidence

	Confident %	Would like to be more confident %	Not relevant %	Satisfied with support %
Securing funding	40	59	1	54
Knowledge exchange	46	47	7	58
Public engagement and outreach	47	47	6	55
Collaborations outside HE	47	45	8	50
Participating in continuing professional development	54	26	21	57
Knowledge of research strategies/priorities	54	44	2	62
Demonstrating impact	55	44	1	57

Just over half of respondents expressed confidence in demonstrating impact (55%) and knowledge of local/UK/international research strategies (54%), as well as for participation in continuing professional development (54%). For the latter, 21% of respondents indicated that this was not currently relevant to them, a much higher proportion than for any other activity.

For all activities there was a general correlation between extent of confidence in activities and satisfaction with the range and quality of support available. However, some respondents noted in their free-text responses that they were not provided with an option to record a lack of knowledge in the support and development opportunities available to them. Achieving better understanding of levels of knowledge and satisfaction will be considered for PIRLS 2013.

5.1.2 Leadership and management

Table 8 shows that in terms of support available for leading and managing a team of researchers, most respondents expressed confidence in supervising postgraduate researchers (84%). Two thirds of respondents expressed confidence in building and managing a research group (68%) and motivating individuals (67%). A lower proportion (just over half) was confident in budget management (53%). Notable proportions of respondents would like to be more confident in these three areas, particularly budget management (43%).

Respondents' confidence levels in some of the specific skills necessary to manage a research team tended to be somewhat lower than the general leadership skills (Table 9). 72% of respondents were confident about recruiting and selecting research staff and around 60% were confident about the processes of induction, probation and appraisal (59%), as well as providing career development advice (62%). Only half of respondents reported confidence in relation to managing performance (51%) and the terms and conditions of employment for research staff (48%).

Significant proportions of respondents would like to be more confident in all these areas, particularly managing performance (44%) and terms of conditions of employment (43%). This echoes the findings of the review of the use of fixed-term contracts. This found that much effort has been made by institutions in reviewing and developing formal processes and procedures; even so, principal investigators do not necessarily identify with the role of 'line-manager' in terms of the implementation of human resources policies, so more communication is needed to embed these processes[21].

5.1.3 Differences between sub-populations

For almost all activities the proportions of respondents reporting confidence correlated strongly with levels of research experience. Respondents with ten or more years' experience as a research leader expressed more confidence than overall respondents for every activity, except for participation in continuing professional development, where the proportion was similar. A higher proportion of more experienced respondents (24%) suggested that continuing professional development was not currently relevant to them.

Slightly higher proportions of experienced respondents were satisfied with the support available for most activities than overall respondents and for other activities the proportion was similar.

Table 8 Respondents' confidence and satisfaction with support available for leadership and management activities

	Confident %	Would like to be more confident %	Not relevant %	Satisfied with support %
Supervision of postgraduate researchers	84	14	2	77
Building and managing a research group	68	29	3	60
Motivating individuals	67	30	3	61
Time management	67	32	1	61
Budget management	53	43	4	50

Table 9 Respondents' confidence and satisfaction with support available for employment-related activities

	Confident %	Would like to be more confident %	Not relevant %	Satisfied with support %
Recruitment and selection	72	23	6	67
Induction	62	28	11	63
Providing career development advice	61	33	7	58
Probation and appraisal	59	31	10	62
Managing performance	51	44	5	58
Terms and conditions of employment for research staff	48	43	9	56

[21] 'Researchers, fixed-term contracts and universities: understanding law in context', 2010, Vitae

Table 10 Respondents' confidence in good research conduct and participation in continuing professional development by broad subject groups

	Medical and biomedical %	Biological sciences %	Physical sciences %	Engineering and technology %	Social sciences %	Arts and humanities %	Overall %
Confidence in good research conduct	81	81	81	75	83	72	80
Confidence in continuing professional development participation	69	47	46	55	51	44	54
Seek more confidence in continuing professional development participation	20	33	24	26	24	34	26
Continuing professional development participation not relevant	11	21	30	20	24	22	21
Number of responses (N)	571	498	525	326	386	205	2588

Significantly lower proportions of female respondents than males expressed confidence in all the activities listed, except for research conduct and public engagement, where proportions were similar. Female respondents also tended to express slightly or significantly lower levels of satisfaction in the support available for most activities. The only activity in which proportionally more females expressed confidence than males was participation in continuing professional development, and a lower proportion of female respondents (16%) indicated that it was not relevant to them.

Respondents who currently had no responsibility for research staff were analysed as a discrete sub-population. The profile of their confidence levels was similar for most activities to that displayed by respondents with least research experience. In relation to the employment and management functions, significantly fewer respondents with no research staff responsibilities expressed confidence, and relatively higher proportions stated that the activity was not currently relevant to them. In many cases it was this group of respondents that provided the majority of 'not relevant' responses in these areas.

Analysis by broad subject groups revealed extensive differences, some of which were significant (Table 10). These significant levels of variation between different subject groupings merit further detailed exploration and suggest caution is needed when interpreting aggregate HEI results. Analysis by subject groups, or department/faculty if available, may be needed to understand better apparent variations in responses.

For example, lower proportions of respondents working in arts and humanities (72%) and in engineering and technology (75%) expressed confidence in relation to good research conduct than overall (80%). Confidence levels were slightly higher than average for respondents in social sciences (83%).

Responses in relation to participation in continuing professional development were particularly complex by subject. A significantly higher proportion of those in medical and biomedical sciences (69%) were confident about participation in continuing professional development than overall (54%). While those in arts and humanities (44%), biological (47%) and physical sciences (46%) were the least confident.

A third of respondents in the arts and humanities (34%) and biological sciences (33%) would like to be more confident about participating in continuing professional development, compared to a fifth or a quarter of those in other broad subject groups. A significant proportion of respondents in the physical sciences (30%) reported that participation in continuing professional development was not currently relevant to them; this was much higher than amongst respondents in medical and biomedical sciences (11%) or overall (21%).

5.2 Recognition and value

Respondents were asked about their participation in appraisal and its usefulness for a range of topics. They were asked to identify the extent to which they believed that their institution recognises and values their contributions to various aspects of being an academic.

5.2.1 Appraisal and staff review

82% of respondents reported that had been appraised or reviewed within the last two years, a considerably higher proportion than the 55% of research staff reported in CROS 2011. Of those respondents who had not undertaken an appraisal or review, the majority (59%) reported that they would have liked the opportunity to have done so.

The reported incidence of appraisal/review was similar for male and female respondents, and slightly higher (84%) amongst those between 41-55 years than younger (79%) or older respondents (78%). In relation to their experience as a research leader, 86% of those with three to nine years' experience reported having had an appraisal in the last two years, and 81% of more experienced respondents, compared with 70% of those with two years' or less experience. This may well reflect that those who have only relatively recently become a research leader have yet to be appraised formally. A somewhat lower proportion of respondents from Russell Group institutions (74%) had participated in appraisal than respondents from other types of institution (89%).

Table 11 Usefulness of appraisal/review for respondents who had undertaken this in the previous two years compared to research staff (CROS 2011)

	Applicable %	Useful or very useful %	CROS Useful or very useful %
For reviewing your personal progress	90	63	68
For setting clear expectations and objectives	90	61	-
Helping to focus on career aspirations and how met by current role	89	49	58
In leading to training and development opportunities	88	40	53
For finding solutions to problems	88	35	-
In leading to changes in work practices	88	31	36

Of those who had not participated in appraisal, more female respondents (69%) than males (54%) wished to have the opportunity to be appraised, as did the majority of younger respondents under 40 years of age (70%). Conversely, fewer than half of respondents with ten or more years of experience, who were not appraised in the last two years, wished to participate in the process.

Respondents who had participated in appraisal/review were asked about its usefulness in relation to a range of activities (Table 11). In terms of reviewing progress and setting objectives/expectations, over 60% of respondents felt that their appraisal had been useful or very useful, but about a third did not.

On the other hand, only around a third of respondents believed their appraisal had been useful or very useful, in relation to finding solutions to problems or leading to changes in work practices; similarly only 40% found it useful or very useful in leading to training and development opportunities. Generally, although appraisal is more widespread amongst research leaders than research staff, research leaders perceive its usefulness to be somewhat lower.

5.2.2 Recognition of contributions to institution

Significantly higher proportions of respondents agreed than disagreed that their contributions to a range of activities were recognised and valued by their institution (Table 12). The highest proportions expressing perceptions of recognition and value were in relation to publications (68%) and research income (64%), and the lowest in relation to managing their research group (47%), other management and administration in the HEI (51%) and demonstrating research impact (52%).

The proportion of respondents who felt that they were not recognised or valued was between a quarter and a third for almost all activities. While 6% to 14% did not know whether they were valued or recognised for these activities. Full results are reported in Appendix 1.

There was a consistent trend when the perceived level of recognition was investigated by gender. For all activities, a lower proportion of female respondents than of male respondents agreed that they felt recognised and valued by the institution (Figure 2). In particular, almost as many female respondents disagreed as agreed with respect to recognition of their contribution to management and administration in the institution, and managing their research group.

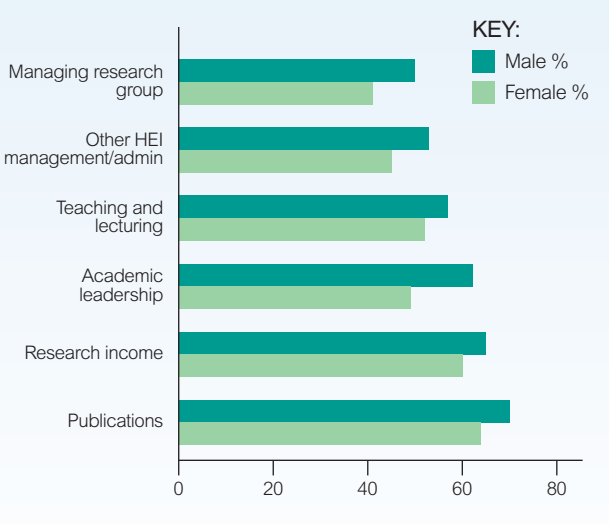

Figure 2 Respondents agreeing or strongly agreeing that their contributions are recognised and valued by their HEI, in relation to selected activities; by gender N=1744 males, 844 females

Table 12 Extent of agreement that instutions recognise and value respondents' contributions in a selection of activities

	Agree strongly %	Agree %	Disagree %	Disagree strongly %	Don't know %	Not applicable %
Research income	21	43	18	9	7	3
Publications	20	48	17	8	6	1
Demonstrating research impact	11	41	23	8	14	3
Management and administration	11	40	22	13	10	5
Managing your research group	9	38	25	9	13	6

Some of these gender differences were more pronounced for some activities when analysed further by age. Fewer female respondents in the middle age range (41-55 years) agreed that they felt recognised and valued for their contribution to management and administration and academic leadership than in other age ranges. Notably, over half of female respondents aged 41-55 years disagreed that they felt recognised and valued in relation to academic leadership.

5.3 Preparing future research leaders

Respondents were asked to rate the importance of the range of research, leadership and management activities in helping research staff to become effective research leaders (Table 13). Generally all research experience and skills were rated highly. Four activities were reported as very important by over 80% of all respondents, and by almost every respondent as very or quite important. These activities were developing a research area (99%), securing research funding (98%), maximising outputs (98%) and preparing research proposals (98%).

Other activities that were rated as very or quite important by over 90% of respondents, but only very important by between half to three quarters of respondents, included academic collaborations (98%), building a research group (96%), good research conduct (90%), motivating individuals (96%), supervising postgraduate researchers (95%) and managing performance (90%).

The activities that the largest proportions of respondents deemed not at all or not very important were participating in continuing professional development (41%), induction, probation and appraisal (35%), terms and conditions of employment for research staff (29%), and public engagement (27%). Along with budget management and providing career development advice, less than a quarter of respondents rated these activities as very important in developing research leaders (Table 14).

Table 13 Activities rated by 90% or more of respondents as very or quite important in helping research staff become effective future research leaders

	Very important %	Quite important %	Not very important %	Not at all important %
Securing funding	87	11	1	<1
Developing research area	84	15	1	0
Preparing research proposals	84	14	1	<1
Maximising research outputs	82	16	1	<1
Academic collaborations	74	24	1	<1
Motivating individuals	69	27	2	<1
Leading a research team	67	28	3	<1
Building a research group	65	31	3	<1
Supervising postgraduate researchers	64	31	3	<1
Good research conduct	53	37	8	1
Managing performance	44	46	7	1

Table 14 Activities rated by a fifth or more of respondents as not very or not at all important in helping research staff become effective future research leaders

	Very important %	Quite important %	Not very important %	Not at all important %
Participating in continuing professional development	14	41	32	9
Induction/probation/appraisal	14	49	29	6
Terms and conditions of employment for research staff	22	46	26	3
Public engagement	21	50	23	4
Providing career development advice	21	53	21	4
Knowledge exchange	25	48	21	2
Collaborations outside HE	31	44	19	3
Budget management	21	57	19	1

Further investigation of the perceived importance by respondents of research staff participating in continuing professional development revealed a marked difference between male and female respondents. 48% of male and 30% of female respondents viewed participating in continuing professional development as not very or not at all important in becoming a research leader. Respondents with the least experience rated it as more important. By subject, more than 60% of respondents in physical sciences (excluding engineering), and 47% in biological sciences, held the view that participating in continuing professional development was unimportant, much higher than in the other broad subject groups.

For most activities, the rating of the importance of most activities was influenced more by the level of confidence expressed by the sub-groups in the activity than by differences in the respondents' research experience, age or gender. On the other hand, variations by broad subject groupings appear more significant and may merit more detailed analysis.

Mapping respondents' perceptions of the importance of activities for future research leaders against their own confidence in these activities revealed a fairly strong correlation (Figure 3).

While it should be noted that this comparison is of respondents' own confidence in these activities compared to their view of the importance of these activities for the development of others, CROS 2011 respondents report that their principal investigator is a critical source of advice for research staff on their career development.

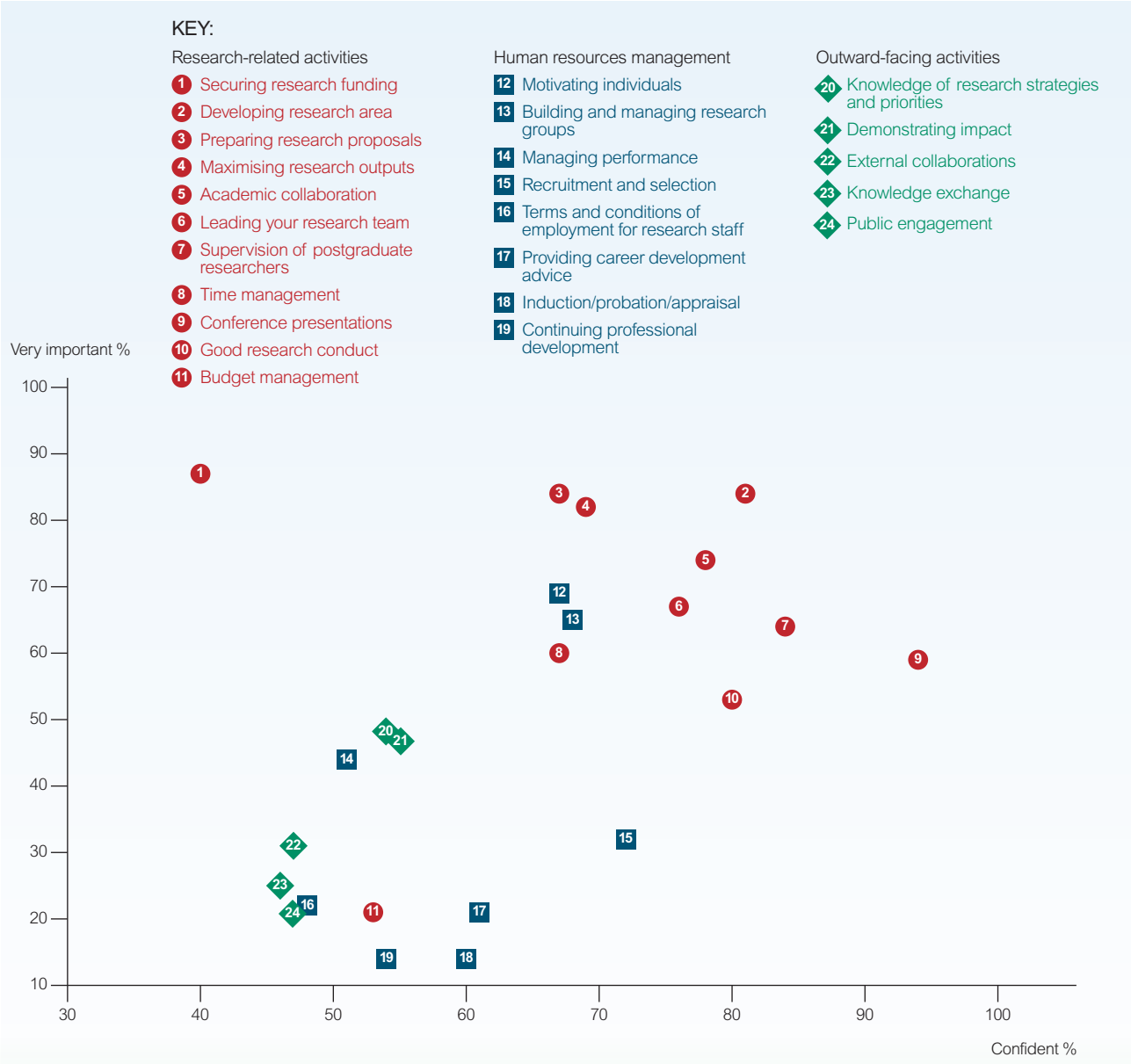

Figure 3 Respondents' perception of importance of activities and functions for development of research leaders, against their own confidence in those activities

5.4 Equality and diversity

Respondents were asked whether they believed their institution was committed to equality and diversity and whether all staff were treated fairly. They were asked whether they had felt discriminated against in their current post.

86% of respondents believed that their institution was committed to equality and diversity, with 10% disagreeing and 5% who did not know. This is consistent with the 87% of research staff responding positively to the same question in CROS 2011.

Analysed by gender, 16% of female respondents disagreed that the institution was committed to equality and diversity, compared with 7% of male respondents. There were no significant differences with age of respondent overall, but the proportion of female respondents aged 41-55 years in disagreement with the statement was higher (19%) than for female respondents overall.

The majority of respondents believed that their institution treated staff fairly irrespective of their ethnic background, gender, religion or belief, sexual orientation, disability or age (Table 15). Only for age (13%) and gender (17%) did more than 10% of overall respondents disagree, although substantial proportions of respondents did not know in relation to certain protected groups.

These perceptions were investigated further for the effected sub-group of respondents. Responses for different age ranges were not significantly different in their perceptions of fair treatment with respect to age, although younger respondents tended to be slightly more positive. The proportion of female respondents (22%) expressing strong belief in fair treatment was much lower than overall (35%). More than three times (31%) as many female than male respondents disagreed that there was fair treatment in relation to gender.

When analysed by both age and gender, no significant differences were observed between male and female respondents in particular age ranges when asked about fair treatment in relation to age. However, the proportion of female respondents aged 41-55 disagreeing that there was fair treatment in relation to gender was considerably higher at 36%, than amongst younger female respondents (23%) or older (29%).

Table 15 Extent of agreement that the institution treats staff fairly overall, irrespective of age or gender

	Agree strongly %	Agree %	Disagree %	Disagree strongly %	Don't know %	N
Age (overall)	32	48	11	2	7	2588
40 and under	37	44	9	3	7	665
41-55	31	49	12	2	7	1382
Over 55	31	48	12	2	6	541
Gender (overall)	35	42	14	3	7	2588
Females (all)	22	41	25	6	7	844
Females 40 and under	26	45	18	5	7	248
Females 41-55	19	39	29	7	6	454
Females over 55	22	42	25	4	9	142
Males (all)	42	43	8	1	7	1744

Table 16 Extent of agreement that HEI treats staff fairly, regardless of background or protected group for selected activities

	Agree strongly %	Agree %	Disagree %	Disagree strongly %	Don't know %	N
Progression/promotion						
Overall	31	41	16	5	7	2,588
Females	19	42	24	7	8	844
Females 41-55 yrs	17	41	26	9	8	454
Reward						
Overall	27	41	18	5	9	2588
Females	16	40	26	8	11	844
Females 41-55 yrs	15	40	26	9	10	454
Participation in decision-making						
Overall	27	41	18	8	7	2,588
Females	18	41	24	10	8	844
Females 41-55 yrs	17	39	25	12	8	454

Overall, the great majority of respondents believed that their institution treated staff fairly, regardless of ethnic background, gender, religion or belief, sexual orientation, disability or age, in relation to access to training and development (90%), treatment at work (85%), and recruitment and selection (88%).

Somewhat lower proportions of respondents agreed that their institution treated staff fairly, regardless of ethnic background, gender, religion or belief, sexual orientation, disability or age in relation to reward (68%), career progression/promotion (72%) and participation in decision-making (68%). Over 20% did not think the institution treated staff fairly, and a further 7-9% did not know for these three activities (Table 16).

Investigating by gender, higher proportions of female respondents disagreed that the HEI treated staff fairly in relation to all protected groups compared to overall respondents. Relatively high proportions of female respondents disagreed that their institution treated staff fairly in relation to career progression/promotion (31%), reward (34%) and participation in decision-making (34%). The proportions of female respondents in disagreement were higher still for those aged 41-55 years in relation to promotion/progression (35%) and participation in decision-making (37%) than amongst all female respondents. This pattern was not seen with respect to reward.

15% of respondents reported that they had felt discriminated against in their current post (Table 17), compared to 10% in CROS 2011. Responses differed considerably by gender, with 26% of female respondents reporting discrimination, compared to 9% of males. Analysis by gender and age groups revealed further variation. 30% of female respondents aged 41-55 years and 28% of those older reported discrimination compared to 18% of female respondents aged 40 or less. Although this may indicate that discrimination could be reducing for younger female researchers, this level of reported discrimination was still more than twice that reported by male respondents (8%) aged 55 years or below.

Table 17 Respondents reporting discrimination in current post

	Yes %	No %	N
Overall	15	85	2.588
40yrs or less	12	88	665
41-55yrs	15	85	1.382
56 or over	18	82	541
Females	26	74	844
40yrs or less	18	82	248
41-55yrs	30	71	454
56 or over	28	72	142
Males	9	91	1.744
40yrs or less	8	92	417
41-55yrs	8	92	928
56yrs or over	14	86	399

The proportions of respondents expressing disagreement in relation to perceived fairness of treatment were distinctly higher than expressed by research staff responses to comparable questions in CROS 2011. Similarly, although there were some differences in attitudes between the genders in CROS, these were much less significant than expressed by research leader respondents to PIRLS.

5.5 Work-life balance

When asked about satisfaction with their work-life balance, just over half of respondents (51%) felt satisfied, while 31% disagreed, 15% disagreed strongly and 1% did not know. This was a substantially lower level of satisfaction than reported by research staff in CROS 2011, where around 70% reported that that they were satisfied with their work-life balance. Within CROS 2011, there was a slight difference by gender, with slightly more female respondents reporting dissatisfaction than males. There was also a sub-population, of those with long service, but employed on repeated fixed-term contracts, who were least satisfied with their work-life balance.

In PIRLS significant variations in the proportions of respondents expressing satisfaction with their work-life balance were identified in a range of sub-groups, although many of these variations may not be independent:

- more respondents in their first two years of research leadership were satisfied with their work-life balance (58%), beyond this the level remained consistent at around 51%
- 56% of male respondents were satisfied with their work-life balance compared to 46% of female respondents
- 49% of respondents between 41-55 years old were satisfied with their work-life balance compared to those aged 40 or less (57%) or over 55 years (56%)
- 42% of female respondents aged 41-55 years and 43% of those over 55 years were satisfied with their work-life balance, compared to younger female respondents (53%) and male respondents in any age group (53%-62%)
- more respondents in biological sciences (57%) and in physical sciences (55%) were satisfied with their work-life balance than overall (51%)
- 46% of respondents in the social sciences were dissatisfied with their work-life balance
- more respondents in Russell Group institutions (56%) and 1994 Group institutions (53%) were satisfied with their work-life balance than those employed in other institutions (46%)
- satisfaction with work-life balance did not appear to be related to the number of research staff for which respondents had responsibility
- more respondents expressing confidence in leading a research team (55%) or managing performance (57%) were satisfied with their work-life balance than those who would like to be more confident (43% and 47%, respectively).

6 Conclusions and recommendations

PIRLS was developed to provide more knowledge and understanding of the views and experiences of research leaders to inform the implementation of the principles of the Concordat at institutional and UK level. Principal investigators and research leaders from 33 UK institutions engaged with PIRLS 2011 providing 2,588 complete responses. The best comparative data suggest that this is approximately a 19% response rate and a reasonably representative sample of research leaders from UK institutions. The responses provide an illuminating insight into the views of this important cohort of their confidence in activities relating to being a research leader, how important these are for future research leaders and how recognised and valued they feel by their institution.

6.1 Role as a research leader

The vast majority of respondents reported high confidence levels in the activities involved in conducting, managing and supervising research, such as developing a research area, presenting at conferences, good research conduct, collaboration with other academics and leading a research group, including supervision of postgraduate researchers.

Reflecting the increasingly competitive funding environment, two thirds of respondents expressed potentially an unrealistic desire to be more confident in securing research funding. A third would like to be more confident in planning and preparing research proposals.

A third of respondents also reported a desire to be more confident in activities relating to the management of people in their research group/s, such as building and managing a research group, time management, recruitment and selection, probation and appraisal, motivating individuals, and providing career development advice.

Almost half of all respondents would like to be more confident in specific people management activities such as managing performance and the terms and conditions of employment of researchers.

Similar proportions of respondents would like to be more confident in outward-facing and impact-related activities, such as knowledge exchange, collaborations with other sectors and research users, public engagement and outreach activities, and demonstrating the impact of their research. These activities are becoming increasingly important for all researchers, especially future research leaders.

The desire of between a third and half of respondents to be more confident across a range of activities can be considered in the context of responses relating to participation in continuing professional development and satisfaction with the range and quality of support available. Just over half reported that they are confident in their participation in continuing professional development, a quarter would like to be more confident, while a fifth did not believe professional development was currently relevant to them. Between 20%-40% of respondents were not satisfied with the range and quality of support available to them.

Recommendations

- Research leaders are encouraged to become more informed about and to participate in professional development activities in areas where they feel less confident, for their own benefit and also to enable them to support better the leadership development of research staff
- Institutions should explore ways to effectively communicate policies and procedures relating to human resource management and the employment of staff, and highlight their relevance to principal investigators and research leaders

6.2 Research leaders' views on preparing future research leaders

Respondents' ratings of the importance they attributed to the range of activities in developing research staff to become future research leaders revealed a broad correlation with groupings of activities by confidence level.

Activities which respondents deemed very important for future research leaders were predominately a cluster of research-related activities, including developing a research area, supervising postgraduate researchers, conference presentations and academic collaborations. This cluster also included leading a research team, managing groups and motivating individuals.

Demonstrating the impact of their research and managing performance were both identified as very important by almost half of respondents, a similar proportion to those expressing confidence in these activities. Both these activities were identified as very or quite important by 90% of respondents.

The cluster of outward-facing activities, such as knowledge exchange, public engagement and external collaborations, were only rated as very important for future research leaders by an average of a quarter of respondents, and similarly ranked fairly low in the level of confidence of respondents in these areas. However, the importance of these activities was recognised by around three quarters of respondents when including those rating them quite important.

Employment-related activities, such as induction/probation/appraisal, recruitment and selection, employment terms and conditions, were rated as very important by very few respondents, indicating that these may be seen as necessary rather than critical activities to becoming a research leader. Budget management also fell within this cluster of activities.

In some way reflecting the disengagement expressed by a significant proportion of respondents in their own development, participation in continuing professional development for future research leaders was rated very important by the lowest number of respondents (14%). When including respondents who think continuing professional development is quite important for future research leaders, this only increases to 55% of respondents.

Given the increasing breadth and complexity of activities that research leaders are expected to engage in, and the levels of confidence expressed by some research leaders in some activities, it could be useful to understand better research leaders' perceptions of continuing professional development.

Research outputs continue to dominate priorities for all researchers and particularly principal investigators and research leaders. It is not surprising, therefore, that activities directly relating to achieving research outputs are rated as most important for future research leaders. Respondents have recognised the growing importance of more outward-facing activities, such as demonstrating impact, knowledge exchange and public engagement. While the dominant driver continues to be research outputs, and with current workloads and research leaders' reported levels of confidence in outward-facing activities, significant change is needed to shift research leaders' priorities and enable them to be effective role models and mentors to future research leaders.

It would be beneficial for institutions to focus on developing support for activities which are deemed very important, but in which research leaders are least confident. This would benefit the development of research leaders themselves, but also ensure that they are able to assist on a more confident basis in the development of research staff.

Recommendations

- Institutions and research funders should consider how to remove obstacles and provide more positive drivers, including workload allocation models, to enable research leaders, and research staff, to engage more effectively in outward-facing activities
- Institutions should explore ways to provide, and encourage research leaders to engage in, effective development activities to increase their confidence in:
  - developing proposals and securing research funding
  - financial and budgetary management
  - performance management and effective appraisals
  - demonstrating impact, knowledge exchange and public engagement

6.3 Recognition and value

Most research leaders report that they are recognised and valued by their institution. Appraisal or review of research leaders appears to be widespread, well embedded and reasonably effective in reviewing progress and setting objectives. However, respondents reported lower levels of usefulness of appraisal in career progression advice and identifying development opportunities.

A significantly higher proportion of research leaders was reviewed than research staff, although research staff report higher levels of usefulness (CROS 2011). While research leaders report high levels of confidence in undertaking appraisal of their staff (62%), only 14% rate it as a very important activity within the development of research staff towards becoming research leaders, despite the perceived usefulness by research staff. Research leaders may need persuading of the value of appraisal as a process in the development of research careers in terms of reviewing progress, performance management and identifying development needs for both themselves and their staff.

Half of respondents reported satisfaction with their work-life balance although there is some imbalance in the views of research leaders according to gender. The majority of male respondents (56%) report that they are satisfied with their work-life balance, but the majority of female respondents (54%) report that they are dissatisfied. Overall, the proportion satisfied with their work-life balance was much lower than amongst research staff (CROS 2011), and those in the middle age ranges seemed to be less satisfied than other age groups.

Recommendations

- Principal investigators and research leaders should ensure that their research staff have the opportunity and are encouraged to participate in an effective appraisal

6.4 Equality and diversity

Although the great majority of research leaders believe their institutions as employers are committed to equality and diversity, some equality issues emerge in relation to gender. As many as a third of female respondents perceive unfair treatment of female staff in relation to progression and promotion, reward and participation in decision-making. A quarter of female respondents believed they have been discriminated against in their current role, which increased to around a third for those over 40 years old.

The perceived gender imbalance, unfairness and perceptions of discrimination, is considerable higher than reported by research staff in CROS 2011, implying that these may be issues related to career progression.

This imbalance was also reflected in respondents' perceived satisfaction with their work-life balance, where respondents expressing least satisfaction were female research leaders over 40 years old. This was the only sub-population with more respondents dissatisfied than satisfied with their work-life balance.

Respondents in the middle age range were more likely to participate in appraisal than overall, reporting average levels of usefulness. Female respondents in this age range expressed higher confidence in participating in continuing professional development and average levels of satisfaction with the range and quality of support available.

Overall, research leaders between 41-55 years old are the least satisfied with their work-life balance and most likely to perceive unfairness of treatment by their employer. This is significantly more pronounced for female research leaders in this group, who are also most likely to feel discriminated against. A lower level of satisfaction with work-life balance in middle age is a widely observed phenomenon[22], although generally males are more likely to express lower job satisfaction than females[23].

It is likely that female respondents are reporting their views and experiences of the structural and cultural environment within higher education that has created a well-recognised gender imbalance[24]. The expectations and practice of long working hours and managing research, teaching and administrative workloads, impact on personal lives, particularly for those with caring responsibilities, who predominately tend to be female. These pressures are likely to be exacerbated in middle age by a combination of parental responsibilities and an increasing need to care for ageing relatives.

Recommendations

- Institutions should review policies and processes, including working conditions, to guard against inequalities between different sub-populations of research leaders, particularly in relation to progression, reward, and participation in institutional and departmental decision-making
- Institutions should seek to identify any sub-populations of research leaders who are less satisfied with the balance of their life and work, and work with them to develop strategies to improve this
- Institutions are encouraged to review their institutional free-text responses to PIRLS relating to equality and diversity, and explore in more detail issues around perceived discrimination or unfair treatment, especially in relation to gender

6.5 Summary and next steps

PIRLS 2011 has engaged a significant number of institutions and research leaders, whose responses constitute a useful baseline view of attitudes to their leadership and management activities, their support of other researchers and whether they feel valued and recognised. This provides a valuable new insight on progress in implementing the principles of the Concordat from this critically important group.

As for every new survey, the experience of conducting PIRLS 2011 has revealed ways in which it can be improved, for example exploring in more detail research leaders' understanding of continuing professional development and allowing more flexibility of responses by making questions optional. The CROS/PIRLS Steering Group will seek additional feedback from participating institutions in how PIRLS can be improved further.

Following the successful launch of PIRLS 2011, the intention of the CROS/PIRLS Steering Group is for PIRLS to continue to run on a biennial basis alongside CROS. The initial funding from the Concordat Strategy Group was to develop and run PIRLS in 2011, analyse and report on the UK aggregate results. Future versions of PIRLS will depend on continued financial support.

Recommendations

- Participating institutions are encouraged to analyse their own PIRLS data and compare with the UK aggregate and benchmarking results, taking into account local factors, and to provide feedback to their research leaders and others
- Participating institutions are encouraged to consider their data alongside their CROS results, together with their Concordat implementation plans
- The Concordat Strategy Group is encouraged to consider continuation of support for the development, implementation and analysis of PIRLS, alongside CROS, as the UK benchmark of research leaders' views and experiences in relation to implementation of the principles of the Concordat
- All institutions are encouraged to participate in future versions of PIRLS as an effective tool to explore research leaders' views, experiences and support for the development of research leaders in relation to the principles of the Concordat
- The CROS/PIRLS Steering Group should explore how PIRLS can be enhanced further by seeking feedback from participating institutions and reflecting on the experience of conducting PIRLS 2011
- The CROS/PIRLS Steering Group should explore whether PIRLS could be used for further investigation to understand better research leaders' perceptions of continuing professional development and their needs in relation to participation in personal and career development

[22] 'Is well-being U-shaped over the life cycle?', Social Science & Medicine, Elsevier, vol. 66(8), pages 1733-1749, April 2008

[23] Work-Life Balance Practices and the Gender Gap in Job Satisfaction in the UK: 'Evidence from Matched Employer-Employee Data', 2008,Institute for the Study of Labor, Discussion Paper No. 3582

[24] HEFCE workshop on equality and diversity in research careers, July 2010 www.hefce.ac.uk/research/careers/event_notes.pdf

Appendix 1: PIRLS 2011 UK aggregate results

This appendix contains the full aggregated percentage responses for the Principal Investigators and Research Leaders Survey (PIRLS) 2011 by question. Results have been rounded to whole percentages, therefore may not sum to 100%. All questions were mandatory except for free text responses (N=2588).

PIRLS 2011

Welcome to the Principal Investigators and Research Leaders Survey (PIRLS) 2011. Thank you for taking the time to share your experience of leading research in UK higher education.

It should only take 15-20 minutes to complete the survey, but the information you provide will be of long-lasting benefit to you, your peers, and the research leaders of the future.

PIRLS has been designed to capture the anonymous views and experiences of principal investigators (PIs) and research leaders working in higher education in the UK.

You should complete PIRLS if you are principally responsible for setting the intellectual direction of the research of your group, and are personally responsible for the management/supervision of research staff and/or research students.

The results from PIRLS will be used by institutions and research funding bodies to improve their understanding of research leadership and to inform actions within the institution, the sector, and research funders. PIRLS will capture respondents' views on what skills and capabilities were essential to their becoming research leaders, the support offered by their institutions and what the research leaders of tomorrow will need to gain the experience and capabilities that they will need.

PIRLS is designed to parallel the Careers in Research Online Survey (CROS), which asks research staff about their experiences and career development.

PIRLS and CROS will have a significant impact on the lives of those conducting and leading research in the UK. Your input and that of your colleagues is therefore very important and highly valued, and we appreciate the contribution you are making by telling us about your experiences.

Section A – examines your experiences as a Principal Investigator/Research Leader

Section B – asks you about support for your role as PI/Research Leader

Section C – asks about your work priorities supporting research staff to become the research leaders of tomorrow

Section D – asks equality and diversity questions

Section E – asks some demographic questions about you

CROS and PIRLS - their purposes and who should complete which one

Please read this section carefully. If you should be completing PIRLS, then simply 'continue'. If you should not be completing PIRLS, then please exit the survey at this point by simply closing the browser tab or window.

Purposes of CROS and PIRLS

CROS: to gather anonymous data about working conditions, career aspirations and career development opportunities for research staff.

PIRLS: to gain responses from PIs about research leadership that will inform actions within the institution, the sector, and the research funders.

PIRLS will capture respondents' views on how they gained the experience and capabilities that have made them research leaders, and on how the research leaders of tomorrow may gain the experience and capabilities that they will need.

Which should you complete?

CROS should be completed if the principal focus of your role – i.e. the primary reason why you are employed – is to undertake research. You may be employed on a fixed-term or open-ended contract. You may be working as a member of a research project group. You may have delegated responsibility for the guidance of research staff or students; you do not, however, have management responsibility for them.

PIRLS should be completed if you are principally responsible for setting the intellectual direction of the research and are also personally responsible for the management/supervision of research staff and/or research students.

A – Your Experience as a PI/Research Leader

1. How long have you been a PI/Research Leader (please include time spent in other institutions)?

	%
Less than a year	4
1-2 years	9
3-5 years	18
6-9 years	18
10 or more years	51

2. How long have you been a PI/research leader in your current institution?

	%
Less than a year	7
1-2 years	13
3-5 years	25
6-9 years	20
10 or more years	35

3. What is your main subject specialism?

	%
Architecture, Building and Planning	1
Biological Sciences	19
Business and Administrative Studies	3
Creative Arts and Design	1
Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects	<1
Education	3
Engineering	10
European Languages, Literature and related subjects	2
Historical and Philosophical studies	3
Law	1
Linguistics, Classics and related subjects	1
Mass Communications and Documentation	1
Mathematical and Computer Sciences	7
Medicine and Dentistry	11
Physical Sciences	14
Social studies	10
Subjects allied to Medicine	10
Technologies	1
Veterinary Sciences, Agriculture and related subjects	2

4. How many people are you responsible for? (%)

	None	1	2-3	4-6	7-10	11-20	>20
Postgraduate research students	10	12	36	28	10	3	2
Research staff	26	25	30	13	4	2	2
Academic staff	71	8	9	4	3	3	3
Technical/administrative/support staff	59	20	13	5	2	1	1

B - Support for your role as PI/Research Leader

For each of the following areas, please consider your abilities, and the range and quality of developmental activities and support available to you (e.g. the support of colleagues or mentors; 'on-the-job' activities; both formal and informal development support).

Please identify in each case

- Whether you are confident in your ability in the area or whether you would like to be more confident
- AND whether or not you are satisfied with the range and quality of developmental activities and support available
- OR whether this area has no current relevance to you.

5. Please indicate whether you are confident, or would like to be more confident, in the following areas of research experience and skills (%)

	I am confident	I would like to be more confident	This area is not currently relevant
Developing a research area or programme	81	18	1
Demonstrating the impact of my research (e.g. academic, economic and societal)	55	44	1
Good research conduct (ethics, IP etc)	80	17	3
Knowledge exchange (through collaborative training, people exchange, commercialisation and development)	46	47	7
Knowledge of research strategies and priorities (locally, nationally and internationally)	54	44	2
Leading your research team	76	21	3
Maximising research outputs (publications etc)	69	30	1
Planning and preparing research proposals	67	32	<1
Public engagement and outreach activities	47	47	6
Securing research funding	40	59	1

6. Please indicate whether you are satisfied or not with the range/quality of activities and support available to develop the following areas of your research experience and skills (%)

	I am satisfied	I am not satisfied	This area is not currently relevant
Developing a research area or programme	70	27	3
Demonstrating the impact of my research (e.g. academic, economic and societal)	57	40	3
Good research conduct (ethics, IP etc)	80	16	5
Knowledge exchange (through collaborative training, people exchange, commercialisation and development)	58	34	8
Knowledge of research strategies and priorities (locally, nationally and internationally)	62	35	3
Leading your research team	73	22	5
Maximising research outputs (publications etc)	68	29	2
Planning and preparing research proposals	66	32	2
Public engagement and outreach activities	55	37	8
Securing research funding	54	44	2

7. Please indicate whether you are confident, or would like to be more confident, in the following areas of your professional profile and networks (%)

	I am confident	I would like to be more confident	This area is not currently relevant
Academic collaborations (including inter-disciplinary and international)	78	21	1
Collaborations outside HE (with other sectors, research users)	47	45	8
Participating in Continuing Professional Development	54	26	21
Presenting at conferences	94	5	1

8. Please indicate whether you are satisfied, or not satisfied, with the range/quality of activities and support available to you to develop the following areas of your professional profile and networks (%)

	I am satisfied	I am not satisfied	This area is not currently relevant
Academic collaborations (including inter-disciplinary and international)	70	27	3
Collaborations outside HE (with other sectors, research users)	50	41	10
Participating in Continuing Professional Development	57	24	19
Presenting at conferences	81	13	5

9. Please indicate whether you are confident, or would like to be more confident, in your ability to manage the following areas of your research groups and projects (%)

	I am confident	I would like to be more confident	This area is not currently relevant
Building and managing a research group	68	29	3
Budget management	53	43	4
Conditions of employment for research staff	48	43	9
Induction	62	28	11
Managing performance	51	44	5
Motivating individuals	67	30	3
Probation and appraisal	59	31	10
Providing career development advice	61	33	7
Recruitment and selection	72	23	6
Supervision of research students	84	14	2
Time management	67	32	1

10. Please indicate whether you are satisfied or not with the range/quality of activities and support available to you to develop your management of research groups and projects (%)

	I am satisfied	I am not satisfied	This area is not currently relevant
Building and managing a research group	60	34	6
Budget management	50	44	6
Conditions of employment for research staff	56	34	10
Induction	63	25	12
Managing performance	58	35	8
Motivating individuals	61	33	7
Probation and appraisal	62	28	10
Providing career development advice	58	34	9
Recruitment and selection	67	25	8
Supervision of research students	77	18	5
Time management	66	29	5

11. Have you been appraised/reviewed in the past two years?

	%
Yes	82
No	18

If your answer was NO, would you have liked the opportunity to be appraised/reviewed?

	%
Yes	59
No	41

12. If you have participated in your institution's staff review/appraisal scheme how would you rate this scheme's usefulness in helping you to reflect on your role and responsibilities as a PI/Research Leader… (%)

	Very useful	Useful	Not very useful	Not at all useful	Not applicable
In setting clear expectations and objectives?	13	43	23	12	10
In identifying your strengths and achievements?	13	42	22	13	10
In leading to training or other development opportunities?	8	27	34	19	12
In leading to changes in work practices?	5	22	37	24	12
For highlighting challenges?	10	42	23	15	11
For finding solutions to problems?	6	25	34	23	12
In helping you focus on your career aspirations and how these are met by your current role?	10	34	26	19	11
In reviewing your personal progress?	15	42	20	13	10

13. To what extent do you agree that your institution recognises and values the contributions that you make to… (%)

	Agree strongly	Agree	Disagree	Disagree strongly	Don't know	Not applicable
Promoting the institution?	14	44	19	10	13	2
World-class research?	19	42	19	10	8	2
Academic leadership?	16	39	23	10	10	2
Research income?	21	43	18	9	7	3
Publications?	20	48	17	8	6	1
Demonstrating impact of research?	11	41	23	8	14	3
Managing your research group?	9	38	25	9	13	6
Teaching and lecturing?	12	44	18	11	8	8
Supervising research students?	11	46	21	9	9	4
Management and administration within the institution?	11	40	22	13	10	5

14. Please use this space if you would like to make any comments about your role as a PI/Research Leader that you feel have not been addressed in the questions above (Optional)

C – Preparing the research leaders of tomorrow

15. For each of the following, which lists alphabetically most of the items in Questions 8-10, please rate how important each is in helping research staff become effective research leaders. (These items are in addition to the critical requirements of securing funding and research outputs) (%)

	Very important	Quite important	Not very important	Not at all important	Don't know
Academic collaborations (including interdisciplinary and international)	74	24	1	<1	1
Budget management	21	57	19	1	1
Building and managing a research group/research staff	65	31	3	<1	1
Collaborations outside HE (with other sectors, research users)	31	44	19	3	3
Conditions of employment for research staff	22	46	26	3	3
Participating in Continuing Professional Development	14	41	32	9	3
Demonstrating the impact of their research (e.g. academic, economic and societal)	47	41	9	2	2
Developing a research area or programme	84	15	1	0	1
Good research conduct (ethics, IP etc)	53	37	8	1	2
Induction, probation and appraisal	14	49	29	6	3
Knowledge exchange (through collaborative training, people exchange, commercialisation and development)	25	48	21	2	3
Knowledge of research strategies and priorities (local, nationally and internationally)	48	42	7	1	1
Leading a research team	67	28	3	<1	1
Managing performance	44	46	7	1	2
Maximising research outputs (publications etc)	82	16	1	<1	1
Motivating individuals	69	27	2	<1	1
Planning and preparing research proposals	84	14	1	<1	1
Presenting at conferences	59	37	4	<1	1
Providing career development advice to others	21	53	21	4	2
Public engagement and outreach activities	21	50	23	4	2
Recruitment and selection process	32	48	15	2	2
Securing research funding	87	11	1	<1	1
Supervision of research students	64	31	3	<1	1
Time management	60	35	3	<1	1

16. Please use this space if you would like to make any comments about preparing the Research Leaders of tomorrow that you feel have not been addressed in the questions above (Optional)

D – Equality and Diversity

17. Please indicate your level of agreement or disagreement with the following statements (%)

	Agree strongly	Agree	Disagree	Disagree strongly	Don't know
I believe my institution is committed to equality and diversity.	40	46	8	2	5
I am satisfied with my work-life balance	11	41	31	15	1

18. Overall, I think that staff at my institution are treated fairly, regardless of ethnic background, gender, religion or belief, sexual orientation, disability or age with regard to… (%)

	Agree strongly	Agree	Disagree	Disagree strongly	Don't know
Recruitment and selection	41	47	6	2	5
Career progression / promotion	31	41	16	5	7
Reward	27	41	18	5	9
Day to day treatment at work	35	50	8	3	4
Access to training and development	40	50	4	1	6
Participation in decision making	27	41	18	8	7

19. Overall, I think that staff at my institution are treated fairly irrespective of… (%)

	Agree strongly	Agree	Disagree	Disagree strongly	Don't know
Age	32	48	11	2	7
Ethnicity	41	46	4	1	9
Disability	38	45	3	1	14
Gender	35	42	14	3	7
Gender identity	33	39	3	1	25
Nationality	39	46	5	2	8
Pregnancy and maternity	34	44	7	2	14
Sexual orientation	36	41	1	<1	22
Religion/belief	39	43	1	1	16

20. Have you felt unfairly discriminated against in your current post?

	%
Yes	15
No	85

If YES, please explain in what way you felt discriminated against?

21. Please provide any additional comments you have about diversity and equality (Optional)

E – About You

22. What is your age?

	%
25 and under	0.2
26 – 30	1.0
31 – 35	9.1
36 - 40	15.5
41 – 45	18.9
46 - 50	18.9
51 – 55	15.6
56 – 60	11.8
61 or older	9.1

23. What is your gender?

	%
Female	32.6
Male	67.4

24. Are you a UK/British national?

	%
Yes	80.6
No	19.4

(a) If you are a UK/British national, how would you classify your ethnic group and cultural background?

	%
White	
White British	56.1
White English	15.8
White Scottish	7.4
White Welsh	2.6
White Irish	1.3
Any other White background	5.7
Mixed	
Mixed White and Black Caribbean	0.1
Mixed White and Black African	1.1
Mixed White and Asian	0.4
Any other Mixed background	0.3
Asian	
Asian, Asian British, Asian English, Asian Scottish or Asian Welsh Indian	1.1
Asian, Asian British, Asian English, Asian Scottish or Asian Welsh Pakistani	0.2
Asian, Asian British, Asian English, Asian Scottish or Asian Welsh Bangladeshi	0.1
Any other Asian background	0.2
Black	
Black, Black British, Black English, Black Scottish, or Black Welsh Caribbean	0.1
Black, Black British, Black English, Black Scottish, or Black Welsh African	0.1
Any other Black background	0
Chinese, Chinese British, Chinese English, Chinese Scottish, Chinese Welsh	2.0
Rather not say	4.4
Other	1.7

(b) If no, are you a national of another EU member state?

	%
Yes	64.7
No	35.3

25. Do you consider yourself to have any form of disability? (Select all that apply)

	%
No	95.1
Specific learning disability	0.5
General learning disability	0.1
Cognitive impairment	0.2
Long-standing illness or health condition	2.2
Mental health condition	0.5
Physical impairment or mobility issues	0.9
Deaf or serious hearing impairment	0.5
Blind or serious visual impairment	0.1
Multiple disabilities	0.1
Other	0.9

26. Please provide any final, additional comments (Optional)

Appendix 2 CROS/PIRLS Steering Group

The Careers in Research Online Survey and Principal Investigators and Research Leaders Survey (CROS/PIRLS) Steering Group exists to ensure the appropriateness and sustainability of CROS and PIRLS and their associated activities in collecting and reporting the views and experiences of research staff, principal investigators and research leaders employed in higher education (HE).

Terms of reference

1. Ensure that CROS meets the needs of the HE sector in collecting research staff views of their career development needs and opportunities and in making these views available to the sector.
2. Ensure that PIRLS meets the needs of the HE sector in collecting the views and experiences of principal investigators in developing research leaders in HE and in making these views available to the sector.
3. Provide sector and key stakeholder input to the ongoing development of CROS and PIRLS, consulting with the sector where appropriate.
4. Promote the value of CROS and PIRLS to the sector, encouraging institutional engagement and the sharing of practice.
5. Responsible for the control and coordination of CROS and PIRLS, including the timings and frequency of operation.
6. Work with the Institute of Learning and Research Technology (ILRT), a department of the University of Bristol and Vitae, to ensure the availability of sufficient resources, administrative support and appropriate protection of the CROS and PIRLS data.
7. Be the custodian of the CROS and PIRLS data, including overseeing the specification and production of any reports of the aggregate CROS and aggregate PIRLS results by Vitae and responding appropriately to requests for access to the results.
8. Work with Vitae to ensure appropriate links with the implementation of the Concordat principles and other relevant policy developments.

Current membership

Glyn Atherton	University of Liverpool
Rosie Beales	Research Councils UK
Lisa Burman	University of Coventry
Frank Chambers	University of Gloucestershire
Hannah Chaplin	HEFCE
Odette Dewhurst	University of Leeds and Vitae Research Staff Development Advisory Group (ReSDAG)
Ian Forristal	Queen Mary, University of London
Mike Gulliver	ILRT, University of Bristol
Rob Hardwick	University of Leicester and UK Research Staff Association (UKRSA)
Lesley Heseltine	Newcastle University
Lucy Lee	University of Sheffield
Alison McCleery	Edinburgh Napier University
Janet Metcalfe	Vitae
Anna Price	Kings College London
Meg Tait	University of Cambridge
Jane Wellens	University of Nottingham
Sara Williams	Cardiff University
Andy Wilson (chair)	Loughborough University

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of researchers

The PIRLS survey has been developed by the Research Concordat Strategy Group and the CROS (Careers in Research Online Survey) Steering group from the 2005 Research Leaders survey. Its aim is to gain responses from principal investigators' and research leaders' views on how they gained the experience and capabilities that have made them research leaders, and on how the research leaders of tomorrow may gain the experience and capabilities that they will need. Outputs will inform actions within the institution, the sector, and research funders.

The CROS/PIRLS Steering Group exists to ensure the appropriateness and sustainability of PIRLS and its associated activities, ensuring that PIRLS meets the needs of the higher education sector in collecting principal investigators' and research leaders' views and in making these views available to the sector.

Vitae provides administrative support and resources for the CROS/PIRLS Steering Group. It has analysed the PIRLS 2011 results and produced this publication on behalf of and under the guidance of the CROS/PIRLS Steering Group.

PIRLS is hosted on the Bristol Online Survey (BOS) tool provided by the Institute of Learning and Research Technology (ILRT), based at the University of Bristol. BOS provides a secure web environment for the design, delivery, administration and analysis of online surveys.

Vitae is supported by Research Councils UK,(RCUK), managed by CRAC: The Career Development Organisation and delivered in partnership with regional Hub host universities.

Vitae works with UK higher education institutions (HEIs) to embed professional and career development in the research environment. Vitae plays a major role in innovating, sharing practice and enhancing the capability of the higher education sector to provide professional development and training for researchers.

Our vision is for the UK to be world-class in supporting the personal, professional and career development of researchers.

Our aims:

- build human capital by influencing the development and implementation of effective policy relating to researcher development
- enhance higher education provision to train and develop researchers
- empower researchers to make an impact in their careers
- evidence the impact of professional and career development support for researchers.

For further information about the range of Vitae activities go to www.vitae.ac.uk or contact website@vitae.ac.uk

Vitae c/o CRAC, 2nd Floor, Sheraton House, Castle Park, Cambridge, CB3 0AX

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