Annex B

Approaches to transferable skills training for researchers: Country notes

Australia[1]

Australian government response (Department of Innovation, Industry, Science and Research)

Transferable skills training for researchers

The Australian government does not have a specific strategy or agenda for transferable skills training for researchers. However, its Research Workforce Strategy, introduced in 2011, recognises the importance of generic skills training for Higher Degree by Research (HDR) students, particularly for allowing them to operate in diverse workplaces. With respect to programmes, at a national level, the Commercialisation Training Scheme (CTS) aims to equip researchers with skills to bring research-based ideas to market. Introduced in 2007, the programme offers 6 (24) months of full-time (part-time) training (additional to the regular course load) via lectures and practical learning, and caters for around 250 HDR students each year. The course is funded by the Department of Innovation, Industry, Science and Research and successful completion results in a graduate certificate qualification. The programme was evaluated in 2010; it found that government support of commercialisation training was appropriate, and recommended some possible approaches for future training initiatives.

Training for Master's-level students

There is no specific strategy or programmes for Master's-level students; however, the CTS described above is open to Master's by research students.

Workplace experience

The government described two programmes that support the development of transferable skills via workplace experience. The first, Researchers in Business, was introduced in 2009 and supports the placement of researchers

from universities or public research bodies into firms that wish to develop a new idea with commercial potential. Over 100 doctoral candidates or post-docs have participated since the beginning of the scheme; placements are for 2-12 months and funding for up to 50% of salary costs (up to AUD 50 000) are paid by the government. The second example is the Cooperative Research Centres (CRC) programme, introduced in 1991. This programme aims to support end-user driven research collaboration, but also includes significant education and training activity, since each centre must offer an education programme that trains PhDs (many go beyond this to train students in all levels of postgraduate degrees, and some also target lower levels). The length of experience offered depends on the research project. In 2009-10, 305 higher degrees were awarded by universities to students studying through a CRC, including 218 PhDs. Funding comes from government, industry and research participants, and industry participants may sponsor additional student placements within their organisations. The CRC programme has been evaluated; the issue of research training via CRCs was assessed as requiring more analysis (see O'Kane Review (link below), 2008, p. 65-66).

Wider research career development agenda

The Australian government recognises that university research training programmes must include "soft" and generic skills development to support students in diverse employment contexts. It also considers that it has a role in facilitating research workforce mobility by providing funding and incentives to overcome financial barriers to intersectoral mobility.

International co-operation

With collaborative and multidisciplinary research environments becoming the norm, the Australian government supports the international movement of researchers, and research collaboration and exchange via numerous programmes.

Links:

- Research Workforce Strategy: *www.innovation.gov.au/Research/ResearchWorkforceIssues/Documents/ResearchSkillsforanInnovativeFuture.pdf*
- Commercialisation Training Scheme: *www.innovation.gov.au/Research/ResearchBlockGrants/Pages/CommercialisationTrainingScheme.aspx*

- Researchers in Business: *www.enterpriseconnect.gov.au/services/pages/researchersinbusinessgrant.aspx*
- Cooperative Research Centres: *www.crc.gov.au*
- O'Kane Review (2008) – Collaborating to a Purpose: *https://www.crc.gov.au/HTMLDocuments/Documents/PDF/CRCReviewReport.pdf*

Austria

Austrian federal government information (Federal Ministry of Economy, Family and Youth; Federal Ministry for Science and Research)[2]

The Austrian federal government's strategy for research, technology and innovation, presented in March 2011, identifies the need for adequate human resources, along with their mobility and career development, as a key challenge, and the development of human resources is targeted by higher education programmes. However, there are no specific federal government strategies directly aimed at building transferable skills in researchers, and the curricula of higher education programmes seldom feature specific criteria related to transferable skills.

Various stakeholders offer programmes that provide transferable skills, such as:

- Structured doctoral programmes ("Doktoratskollegs"): the Austrian Science Fund offers a programme to fund structured doctoral programmes at research institutions that are entitled to award a doctoral degree. The programmes are formed as a result of a joint initiative by several scientists or scholars whose research is of an internationally leading standard and are based on clearly defined research programmes. The programmes provide for a stay abroad and offer transferable skills training.
- The "fForte Coaching" programme: this programme offered by the Federal Ministry for Science and Research (BMWF) is a two-semester course aimed at helping women put together successful grant proposals. It also provides information on various sources of funding as well as personal development, *inter alia*, in order to increase the proportion of women in a range of research funding programmes.

- Research competences – grant application writing skills: funding organisations such as the Austrian Science Fund and the Austrian Research Promotion Agency provide/offer seminars on proposal writing to enhance the writing skills of PhDs and postdocs. The Austrian Agency for International Co-operation in Education and Research also provides guidelines, recommendations and seminars for the elaboration of grant proposals.

- The LISA (Life Science Austria) programme: this programme run by Austria Wirtschaftsservice on behalf of the Federal Ministry of Economy, Family and Youth, promotes the creation of start-ups in the area of life sciences and the commercial application of research results. Specific qualification activities within this programme are aimed at researchers and students as potential entrepreneurs in the life science sector. Examples include business seminars on issues such as team building, leadership and legal issues, and training modules on business in life science courses at the University of Vienna and University of Applied Sciences of Vienna. There is also an international business plan competition – "Best of Biotech" – that is designed to encourage entrepreneurial potential in life science research and exploit research results commercially.

- The publicly-funded organisation "dialog<>gentechnik" holds an annual competition for scientists/students to write press releases as part of their remit in science communication.

There are also several industry-oriented initiatives that enhance transferable skills in researchers. For instance, the programme "Building Research Capacity in Industry", introduced in 2011, is designed to provide targeted funding to support companies in the systematic development and qualification of their research and innovation staff. It encompasses short-duration seminars for employees of Austrian companies through to tertiary level courses provided in conjunction with companies in industry-driven topics. A goal of the programme is a stronger anchoring of business-relevant teaching and research at universities and universities of applied sciences as well as sectoral mobility. In another example, the promotion of collaboration between science and business has given rise to a broad spectrum of temporary institutions that sit alongside universities and firms in Austria. Depending on the particular objectives and parameters of the underlying programmes, these institutions can run for up to 10 years and offer a broad spectrum of researchers the opportunity to acquire a wide range of transferable skills and relevant experience with participating industry partners. Examples of such temporary institutions include Competence Centres for Excellent Technologies (COMET), Christian Doppler Laboratories,

Josef Ressel Centres, Laura Bassi Centres of Expertise and Research Studios Austria (RSA).

Belgium[3]

Flemish government response (Department of Economy, Science and Innovation)

Transferable skills training for researchers

The Flemish government (on behalf of the Flemish community and region of Belgium) currently has no overarching strategy or agenda regarding formal transferable skills training for researchers, and no formal training programmes for developing researchers' transferable skills. However, the government is developing a funding programme for transferable skills training for researchers, which is scheduled for introduction before the end of 2011. Funding of EUR 4 million per year will be provided to universities to support young researchers in doctoral programmes; these programmes include transferable training activities. In addition to explicit government funding, Flemish institutions are also encouraged to respect and implement the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers.

Training for Master's-level students

There are currently no strategies or programmes for Master's-level students. Some funding is foreseen for "innovation internships", although this has still to be developed.

Workplace experience

The Flemish government's Baekeland programme supports the development of researchers' transferable skills through workplace experience. This voluntary "on demand" programme, introduced in 2008, aims to improve research and enable doctoral graduates to work in both the academic and non-academic labour markets. It targets interpersonal skills, research competencies and enterprise skills. The workplace experience accounts for 50% of the candidate's time over four years and is funded 50:50 by the Flemish government and industry. Co-operation between candidates, the supervising academic institution and the enterprise is a key element, as is a commitment to the continuing high standards of doctoral research. Research may be carried out both in the university lab and the company. An agreement on IPRs is made before the start of each project.

Wider research career development agenda

The funding and programmes delivered by the Flemish government are consistent with the directions for researchers' career development set out in the Flemish action plan (Vlaanderen in actie) and a 2010 Action Plan for Researchers.

International co-operation

The Flemish government co-operates internationally on research career development in the framework of the European partnership for researchers and the Innovation Union. It noted an important activity here is the EURAXESS network.

Institutional responses

Three universities from Belgium responded to the questionnaire. For each, doctoral schools were described as the strategy/programme for developing researchers' transferable skills. These schools were introduced in the last five years, and have a common aim of preparing graduates for academic and non-academic careers as well as supporting research. No strategies or programmes for Master's-level students were described. The doctoral school programme described by Universiteit Hasselt includes some workplace experience, and some doctoral students at Ghent University participate in the Flemish government's Baekeland programme.

Universities	Institutions: Key features
Ghent University	Strategy: Doctoral Schools Visietekst Programmes for researchers: Doctoral Training Programme Workplace experience: Student participation in the government's Baekeland programme
Universiteit Antwerpen	Strategy: Antwerp Doctoral School Programmes for researchers: Doctoral Study Programme
Universiteit Hasselt	Strategy: Doctoral Schools at UHasselt Programmes for researchers: Doctoral School of Medicine and Life Sciences Workplace experience: Via doctoral school training

Links:

- Flemish action plan (Vlaanderen in actie): *http://vlaandereninactie.be/?lang=en*
- Action plan for researchers: *www.ewi-vlaanderen.be/sites/default/files/documents/Daar%20zit%20beweging%20in_Een%20Vlaams%20actieplan%20voor%20onderzoekers_web.pdf*
- European Charter and Code for Researchers: *http://ec.europa.eu/euraxess/index.cfm/rights/brochure*
- Ghent University Doctoral School: *www.ugent.be/doctoralschools*
- Universiteit Antwerpen Doctoral School: *www.ua.ac.be/ads*
- Universiteit Hasselt Doctoral School of Medicine and Life Sciences: *www.uhasselt.be/ds-medicine*

Canada

Canadian federal government information (Industry Canada)[4]

There are no specific federal government strategies, policies or programmes directly aimed at building transferable skills in researchers. However, some programmes offered by the Canadian government's research councils and related entities contain elements of such training. For example:

- The National Research Council of Canada manages an Industrial Research Assistance programme (NRC-IRAP) which provides innovative small- and medium-sized enterprises with financial assistance to hire post-secondary science, engineering, technology, business and liberal arts graduates. Graduates work on innovative projects within the enterprise environment and may participate in research, development and commercialisation of technologies. This programme contributes to the Youth Employment Strategy of the Canadian government, part of which is aimed at helping graduates develop advanced work skills.
- The Natural Sciences and Engineering Research Council of Canada (NSERC) provides several programmes that give workplace experience to researchers. The Industrial R&D Fellowships programme (IRDF) provides financial assistance for recent doctoral graduates who wish to engage in research and development in the private or non-for-profit sectors. The Industrial Postgraduate Scholarships (IPS) programme provides financial support to science

and engineering graduates to allow them to gain research experience in industry while undertaking advanced studies, and aims to encourage scholars to consider research careers in industry. The Collaborative Research and Training Experience (CREATE) programme provides experienced researchers with funding to offer a defined research training programme to students and postdoctoral fellows, which provides experience relevant to both academic and non-academic careers.

- The Networks of Centres of Excellence of Canada (financed by investments from Industry Canada, NSERC, the Canadian Institutes of Health Research, and the Social Sciences and Humanities Research Council) offers Industrial Research and Development Internships (IRDI). This programme supports collaborative projects involving graduate students and postdoctoral fellows, their supervising professors and industrial partners.

Institutional response[5]

The Ontario Centres of Excellence (OCE), an independent not-for-profit organisation that is involved in commercialisation, talent and technology transfer activities, responded to the questionnaire. The OCE operates a Talent Strategy, under which several programmes are delivered for researchers and masters-level students and for workplace experience. The Strategy aims to "develop the next generation of innovators who will enable Ontario companies to succeed in the knowledge-based global economy".

Other organisation	Institutions: Key features
Ontario Centres of Excellence	Strategy: Ontario Centres of Excellence (OCE) Talent Strategy Programmes for researchers: OCE Value-Added Personnel Program (also for Master's-level students) Workplace experience: OCE First Jobs Program; Experiential Learning Program

Links:

- National Research Council of Canada Industrial Research Assistance programme (NRC-IRAP): *www.nrc-cnrc.gc.ca/eng/services/irap/youth-initiatives.html*
- Youth Employment Strategy: *www.youth.gc.ca/eng/common/yes.shtml*
- Natural Sciences and Engineering Research Council of Canada (NSERC):
  - Industrial R&D Fellowships programme (IRDF): *www.nserc-crsng.gc.ca/Students-Etudiants/PD-NP/Industrial-Industrielle_eng.asp*
  - Industrial Postgraduate Scholarships (IPS): *www.nserc-crsng.gc.ca/Students-Etudiants/PG-CS/IPS-BESII_eng.asp*
  - Collaborative Research and Training Experience (CREATE) programme: *www.nserc-crsng.gc.ca/professors-professeurs/grants-subs/create-foncer_eng.asp*
- Networks of Centres of Excellence of Canada – Industrial Research and Development Internships (IRDI): *www.nce-rce.gc.ca/NCESecretariatPrograms-ProgrammesSecretariatRCE/IRDI-SRDI/Index_eng.asp*
- OCE Value-Added Personnel Program: *www.oce-ontario.org/Pages/Talent_VAP.aspx*
- OCE First Job Program: *www.oce-ontario.org/Pages/Talent_FJ.aspx*
- OCE Experiential Learning Program: *www.oce-ontario.org/Pages/ELP.aspx*

Denmark[6]

Danish government response (Danish Agency for Science and Technology)

Transferable skills training for researchers

While not an overarching strategy or agenda for transferable skills training, the Ministerial Order on PhD Programmes at Universities (a regulatory document related to the Danish University Act) contains some guidance on transferable-type skills for PhD students. In particular, Section 3 requires PhD students to gain experience of teaching and knowledge dissemination and universities must offer students a course and guidance on teaching (broadly defined to imply "communication"). The Ministerial Order aims to enhance the employability of researchers in academia and enhance teaching.

As part of the Industrial PhD programme (see below), the Danish government funds a 6-day business course aimed at interpersonal skills, communication skills and enterprise skills. The compulsory (for Industrial PhD students) residential course aims to strengthen students' insights into the creation of knowledge, leadership and business economic aspects of their research. The course is provided by the Technical University of Denmark (DTU), on a contract from the Danish Agency for Science, Technology and Innovation.

Training for Master's-level students

There are currently no strategies or programmes for Master's-level students.

Workplace experience

The Danish government's Industrial PhD programme was introduced in 2002 and allows students to complete a 3-year PhD while employed at a private company. It has three broad aims: to educate researchers at a PhD level with knowledge of industrial aspects of research and innovation; to create growth in the Danish business community through the promotion of co-operation on research and innovation between universities and Danish companies; and to facilitate knowledge transfer and networking between Danish companies and researchers at universities in Denmark and abroad. The programme helps prepare researchers for a wider labour market and improves research work. Approximately 116 students participate each year and funding is provided by the Danish Agency for Science, Technology and Innovation.

The programme has had positive effects. Industrial PhDs' wages are approximately 7-10% higher than those of regular PhDs and comparable university graduates. They are also more likely to be in the top levels of their organisations' hierarchies and in positions requiring high-level specialist knowledge. Companies that host Industrial PhDs experience increased patent activity, are characterised by high growth in gross profit, and experience more positive developments in gross profit and employment growth than control firms. Users of the programme also claim very high satisfaction.

Institutional response

Aarhus University described its LEADER programme, introduced in 2011 and funded by the European Union, which provides doctoral students with a mix of transferable skills in a standalone course. The university has international co-operation in transferable skills training through its participation in the Coimbra Network (a network of European multidisciplinary universities). No strategies or programmes for Master's-level students or for workplace experience were described, although the university is investigating possible options for the latter.

University	Institutions: Key features
Aarhus University	Programmes for researchers: LEADER programme

Links:

- Industrial PhD programme:
  http://en.fi.dk/research/industrial-phd-programme
- Business course (Industrial PhD):
  http://en.fi.dk/research/industrial-phd-programme/what-is-an-industrial-phd/the-business-course
- Evaluation of Industrial PhD programme:
  www.fi.dk/filer/publikationer/2011/analysis_of_industrial_phd/index.htm

Estonia[7]

Estonian government response (Ministry of Education and Research)

Transferable skills training for researchers

At the strategy level, the Estonian government supports entrepreneurship training with its "Entrepreneurship studies for non-economic fields: Action Plan for 2010-2013". The plan is overseen by the Ministry of Economic Affairs and Communications and the Ministry of Education and Research. It addresses the content and quality of entrepreneurship education and the wider availability of business education and its integration into professional training. Planned activities include defining learning outcomes, updating curricula (with the priority in science and engineering fields), creating study materials, providing opportunities for teaching personnel to refresh competencies, and launching schemes to facilitate academic-industry mobility. There will also be further development of the Tallinn University of Technology-University of Tartu "technology management" programme, with funding for students to prototype business ideas. The action plan aims to enhance the employability of researchers in academia and the wider labour market, improve research and support better teaching and supervisory skills. Funding is from European Structural Funds.

While not an overarching strategy or agenda for transferable skills training, Estonia's qualifications framework sets some requirements for proficiency in transferable-type skills. In particular, the learning outcomes for doctoral students (described in the Standard of Higher Education, Regulation No. 178, 18 December 2008) demand that PhD recipients can, for example, act independently in complex environments requiring leadership and team work skills, innovative thinking and strategic decision-making, analyse social norms and relationships, present orally or in written form the problems and conclusions of their research to specialist and non-specialist audiences, and hand down knowledge via teaching or instruction.

At the programme level, the Estonian government introduced PRIMUS in 2008, with the aim of supporting improved professional competencies for academic staff (professors, lecturers, doctoral students, researchers). The stand-alone training courses provided under the programme are based on a university teacher competence model and are offered to research staff of partner universities (currently 19 Estonian higher education institutions). Courses include activities to improve teaching and supervisory skills and support strategic management capacity building, and target the full range of transferable skills. Participation is voluntary, although some partner institutions plan to make certain courses mandatory for their staff. In 2010, over

200 different training courses were offered (*e.g.* 17% on communication, 7% on supervision-mentoring), using a variety of delivery methods (*e.g.* lectures, workshops, e-learning) and involving more than 2500 individuals. Courses are provided mainly by training centres run by the University of Tartu and the University of Tallinn, and are supported financially by the European Union Social Fund. Evaluation of the programme is planned for 2013.

Training for Master's-level students

The Estonian government's "Entrepreneurship studies for non-economic fields: Action Plan for 2010-2013" applies also to Master's students.

Workplace experience

Estonia's Operational Programme for Human Resource Development for 2007-2015 (outlining activities and financing funded by the European Social Fund) provides the overarching strategy for transferable skills development via workplace experience. In 2008, the government introduced the Doctoral Study and Internationalisation Programme "DoRa": Training doctoral students in co-operation with business. This programme aims to link research with practical problem solving, and particularly targets enterprise skills, as well as interpersonal, organisational and communication skills. DoRa is targeted to students of Estonian universities in accredited PhD programmes in Estonia's priority R&D areas (as specified in the national RD&I strategy), namely information and communication technology, materials technology, environmental technology, biotechnology, power engineering and health. The programme is funded by the European Structural Fund (EUR 2.6 million for 2008-2015); in addition, participating businesses must be willing to conclude an employment contract and pay at least the minimum wage to students. Training is for four years (the standard period of doctoral study) and 50 students are expected to complete the DoRa programme in the 2008-2015 period. DoRa helps to strengthen co-operation between university academic staff and enterprises.

Wider research career development agenda

The aims of the Primus programme fit within the aims of the Estonian Higher Education Strategy 2006-2015, the National Strategic Reference Framework 2007-2013 (and the Operational Programme for Human Resource Development created from it), and the development plan "Tark ja tegus rahvas" (Wise and active people) 2008-2011.

International co-operation

The Estonian Science Foundation is participating in a European Science Foundation Member Organisation Forum study of a pan-European professional development framework for researchers.

Institutional responses

Three Estonian universities responded to the questionnaire. Two described explicit roles in implementing government programmes, through acting as trainers under PRIMUS, managing doctoral schools and implementing PhD regulations. The University of Tartu noted its Strategic Plan makes reference to transferable skills for students and employees, and all three institutions noted programmes at the university-level (for the Estonian Business School, this involved delivery of training for PRIMUS). Baltic- and European-level co-operation was noted by two institutions. Looking ahead, the Estonian Rectors Conference is working on a new Quality Agreement with Estonian public universities, which will address the mandatory components of doctoral study, including transferable skills, and may trigger change. Tallinn University offers Master's programmes related to transferable skills, while the University of Tartu and Tallinn University noted their participation in DoRa (which involves workplace experience).

Universities	Institutions: Key features
Estonian Business School	Programmes for researchers: partner in government's PRIMUS programme
Tallinn University	Programmes for researchers: Educational Sciences PhD programme; Learning and teaching in multi-cultural study groups (programme under PRIMUS) Master's-level training: Meet government regulations; offer Master's programmes in Organisational Behaviour and Communication Management Tallinn University also participate in government's DoRa programme, although this was mentioned in terms of internationalisation activities, not workplace experience activities.
University of Tartu	Strategy: University of Tartu Strategic Plan 2009-2015 Programmes for researchers: Blocks on general elective subjects and the practice of teaching in the PhD curriculum. The University is involved in delivering the PRIMUS programme. Workplace experience: Participate in government's DoRa programme

Links:

- Entrepreneurship studies for non-economic fields: Action Plan for 2010-2013 (in Estonian): *www.koda.ee/public/MKM_raport.pdf*
- Operational Programme for Human Resource Development for 2007-2015 (in Estonian): *www.hm.ee/index.php?popup=download&id=8838*
- PRIMUS (in Estonian): *http://primus.archimedes.ee/node/5*
- University of Tartu Strategic Plan: *www.ut.ee/544423*

Finland[8]

Finnish government response (Ministry of Education and Culture)

Transferable skills training for researchers

The Finnish government currently has no overarching strategy or agenda regarding formal transferable skills training for researchers, and no formal training programmes for developing researchers' transferable skills. The Ministry has no role in explicitly defining educational content, but in future some guidance for universities may be provided via the steering and funding links between the Ministry of Education and Culture and universities. In particular, an Academy of Finland working group has suggested increasing the structure of doctoral education and giving students similar/equal rights and responsibilities. This would include providing a pan-discipline curriculum of transferable skills at the university level, instead of the traditional doctoral programme-based provision. The majority of Finnish universities have restructured their doctoral training programmes in line with the Academy's suggestions, although they are not yet implemented within the official steering and funding process.

Training for Master's-level students

There are no government strategies or programmes for formal transferable skills training for Master's-level students.

Workplace experience

There are no government strategies or programmes that support the development of researchers' transferable skills through workplace experience. The Academy of Finland has had funding instruments that would support this type of activity, but the aim has been collaboration across sectoral borders rather than learning transferable skills.

Wider research career development agenda

The development of the doctoral education system fits with the strategic emphasis on research careers contained in the current university funding model and with the "four stage researcher career" framework applied by Finnish universities.

Institutional responses

Two Finnish research institutions responded to the questionnaire. Each has some sort of agenda for staff development, and the Finnish Meteorological Institute (FMI) offers several courses to staff to improve various transferable skills. The Institute of Occupational Health (FIOH) lectures in Master's degree programmes, and hosts PhD students. FMI provides opportunities for staff to gain experience in other organisations and abroad.

Research institutions	Institutions: Key features
Finnish Institute of Occupational Health	Strategy: A forum for qualitative and mix-method researchers Master's-level training: Provide lectures in degree programmes Workplace experience: Hosting PhD students
Finnish Meteorological Institute	Strategy: An agenda to develop staff skills, commitment and work satisfaction Programmes for researchers: Project management; Manager training; Language courses Workplace experience: The institute encourages mobility for skill acquisition

France

French government information (Ministère de l'Enseignement supérieur et de la Recherche)[9]

There is no specific French government strategy or agenda directly aimed at building transferable skills in researchers. However, doctoral studies in France aim to support the acquisition of transferable skills, via several paths:

- The new frame for doctoral studies is consistent with the statement made in Bergen (Norway) in 2005 by the ministers of higher education of the 45 countries involved in the Bologna Process, which recommended that doctoral study programmes guarantee interdisciplinary training and the development of transferable skills. Doctoral schools offer students preparation for employment and "doctoriales" (seminars) seek to promote meetings between doctoral

students and economic actors. Specific training organised by doctoral schools (*e.g.* in communication, foreign languages, project management) complement these seminars. Evaluation criteria for doctoral schools include factors related to transferable skills.

- The CIFRE process (conventions industrielles de formation par la recherche) enables doctoral students to study towards their PhD while carrying out research work within both the academic laboratory and a company. This process was initiated in 1981 and is run by the Association Nationale de la Recherche et de la Technologie (ANRT). Students are recruited on either a permanent or a 3-year contract and receive an annual salary. The ANRT (on behalf of the State) provides companies with an annual subsidy, and expenses related to hiring a CIFRE doctoral student are eligible for the Crédit d'Impôt Recherche (CIR – Research Tax Credit). Students receive joint supervision and gain both field experience and academic skills.

In addition, the "Investments for the Future" programme may provide opportunities for researchers to build transferable skills. This programme aims to build larger scientific and technological centres with excellent researchers and scientific institutions. The integration of institutions (universities, colleges, research organisations) in the framework of a common scientific strategy aims to increase international visibility, synergies and impact, as well as improve working conditions for researchers.

Links:

- Doctoral studies (in French):
  www.recherche.gouv.fr/cid20185/le-doctorat.html
- Evaluation of doctoral schools:
  www.aeres-evaluation.com/index.php/Evaluation/Evaluation-of-programmes-and-degrees/Doctoral-school-evaluation-criteria
- CIFRE:
  www.anrt.asso.fr/fr/pdf/plaquette_cifre_complete_avril2009_GB.pdf
- Investments for the Future (in french):
  http://investissement-avenir.gouvernement.fr/content/action-et-projets

Germany[10]

Regional government responses[11]

Transferable skills training for researchers

For most German regions (Länder), training is the direct responsibility of universities, with governments contributing to its financing through their role as principal funder of public higher education institutions. Funding for skills training is also available via the Exzellenzinitiative (Excellence Initiative) and through supra-regional funding organisations such as the Deutsche Forschungsgemeinschaft (DFG – German Research Foundation).

Nevertheless, the Bavarian government has a strategy/agenda and programmes that address transferable skills training for researchers. The strategy – the Elite Network of Bavaria – was introduced in 2002/03 and gives financial assistance and wider support to talented students and young scientists at Bavarian universities. It aims to enhance employability of researchers in academia and improve research work, and to increase Bavaria's competitiveness in attracting talent. Soft skills courses, funded by the Bavarian government, are offered to all members of the Network (doctoral candidates, post-docs and other early stage researchers) –these courses take the form of 2-4 day workshops and target the full range of transferable skills. Over 350 researchers participate each year. In addition, some doctorate programmes of the Network incorporate voluntary 1-7 day courses in soft skills, with approximately 130 candidates participating each year. As well as the Network activities, the government also launched the Bavarian Elite Academy in 1998. This programme is targeted at excellent students (at the undergraduate-, Master's- and doctoral-level) who may choose to become researchers, and around 30 students participate each year. It aims at developing leadership skills through a series of three compulsory 4-week training sessions (during term breaks), using workshops, seminars, projects, internships and excursions. The full range of transferable skills is targeted by the programme.

Looking ahead, the government of Rhineland Palatinate has declared its intent to design and improve human resource development plans, including the issue of transferable skills, for post-docs and early stage researchers. The aim is to improve the status and career opportunities of early stage researchers. Development of these plans and an overarching agenda for all levels of academic careers will take into account the programmes and institutions already in place.

Training for Master's-level students

As well as the Elite Academy, Bavaria's Elite Network is also open to Master's-level students. As such, students may choose to participate in the Max-Weber programme of 2-4 day workshops that target interpersonal, organisational, cognitive and communication skills. These are funded by the government and around 270 students participate each year. Students may also attend the soft skills seminars offered within the Elite Graduate programmes. These target the full range of transferable skills, with training via seminars, workshops and excursions over a period of 1-5 days. They are attended by around 325 students per year.

Workplace experience

The Free State of Thuringia's Research Strategy, introduced in 2008, aims to enhance the region as a centre for research. Within this, there are goals for enhancing the employability of researchers in academic and wider labour markets, improving research, and spurring commercialisation and international co-operation. The strategy takes the view that practical experience is preferable to formal teaching programmes. Two programmes linked to the strategy provide workplace experience for researchers and target the full range of transferable skills. The programme "Funding of management, implementation and publication of R&D activities" offers experience of 2-3 years and has 100-150 participating researchers each year. The "Agenda Proexcellence" aimed to help Thuringian institutions compete in the Excellence Initiative II, and offered experience from 2008-2011 for 100-200 researchers each year.

The development of human resource plans in Rhineland Palatinate will consider the role of workplace experience in career development.

Wider research career development agenda

Bavaria's Elite Network aims to build connections between various scientific and academic centres and across boundaries of individual academic fields. The soft skill courses that are open to all members are seen as fostering this network. Further, by enabling Master's-level students to participate in training programmes, the government aims to give students a chance to have early contact with researchers.

International co-operation

Bavarian universities are linked with each other and with international institutions to create the best possible environment for research and to attract talent.

Institutional responses

One research institution (the Helmholtz Association) replied to the questionnaire. It has a strategy and programmes for transferable skills training for its researchers, which are part of its wider strategy that spans preschool to experienced personnel. Helmholtz noted ongoing change related to continuous improvement of programmes, and pointed to international linkages in its training activities. No specific Master's-level or workplace experience programmes were noted; however, the Helmholtz Association hosts PhD students, offering transferable skills workshops throughout their PhD programme.

Ten universities also submitted replies to the questionnaire. All but one has a strategy or agenda on transferable skills training for researchers, and all offer training programmes. For eight of the universities, graduate academies or schools play an important role in training. These offer co-ordinated programmes to students, usually with the aim of improving employment prospects, research and teaching (supporting international co-operation was also mentioned by some respondents). Three universities described programmes for Master's-level students. One university noted a long-standing practice of supporting workplace experience (via industry PhDs or part-time PhDs).

Through their programmes for researchers, the universities offer a diverse range of transferable skills training opportunities, targeting various combinations of skills and using a variety of approaches. This variety was noted by the government of Rhineland Palatinate, which observed that its universities and polytechnics take different approaches to transferable skills training, with some integrating learning into the curriculum of respective disciplines, and others offering separate courses covering various topics in different formats.

Over half of the universities noted some conditions on funding that required transferable skills training; usually this was related to doctoral programme rules or to conditions of funding from the Deutsche Forschungsgemeinschaft (DFG – German Research Foundation). Six pointed to future changes in their training – either via continuous improvement, or via expansion (*e.g.* more courses and widening the scope). One university noted plans to establish a university-wide graduate academy, while another suggested making the courses obligatory. Half of the universities noted international linkages related to their training activities.

Research institution	Institutions: Key features
Helmholtz Association	Strategy: Talent Management Programmes for researchers: Transferable Skills courses for PhD students; Effective Leadership course; Helmholtz Management Academy Workplace experience: Helmholtz hosts PhD students
Universities	Institutions: Key features
Carl von Ossietzky University Oldenburg	Strategy: Establishment of graduate academy with two graduate schools Programmes for researchers: "olwin" (Human Resources Development for Oldenburg young academics and early stage researchers); CoachWIN (planned for 2012)
Freie Universität Berlin	Strategy: International Network University strategy Programmes for researchers: Dahlem Research School
Friedrich Schiller University Jena	Strategy: Conceptual frame of the Graduate Academy at Friedrich Schiller University Programmes for researchers: Study programme at the graduate academy
Heinrich-Heine-Universität Düsseldorf	Strategy: Part of the university's development plan Programmes for researchers: iGRAD (Interdisciplinary Graduate and Research Academy) and affiliated PhD programmes; Medical Research School; Professional Teaching Competence for university-level teaching Master's-level training: Also part of university development plan; offer Studium Universale and KUBUS (Barriere und Berufsorientierung und Studium) programmes Workplace experience: Part of doctoral regulations and a longstanding practice in faculties
Leibniz Universität Hannover	Programmes for researchers: Promotion Plus
Philipps-Universität Marburg	Strategy: Marburg University Research Academy (MARA) Programmes for researchers: Certificate "Entwicklung und Management von Forschungsprojekten" (Design of and Application for Research Projects); Certificate "Kompetente Hochschullehre" (teaching in the context of institutions for higher education); Softskill programmes of the Graduate Centres and Career Development Program Master's-level training: Strategy to deliver instrumental, systemic and communicative competences; offer approximately 60 Master's programmes that comply with the German National Qualifications Framework
Technische Universität Berlin	Strategy: Continuing Education Program for the Scientific Staff of TU Berlin Programmes for researchers: Grouped under three main topics in the Scientific Continuing Education Program (improving teaching in higher education, research management, working and management techniques)
Technische Universität München	Strategy: Qualification programme for doctoral candidates as part of the German Excellenz Initiative Programmes for researchers: Qualification programme at the TUM Graduate School; programmes from TUM-wide institutions (*e.g.* language centre)
University of Bamberg	Strategy: Scientific Career Service Programmes for researchers: TRAc Doctoral Academy; Fortbildungszentrum Hochschullehre FBZHL (Further Education Centre – Teaching at universities); Sprachenzentrum (university language centre) Master's-level training: Studium Generale; Sprachenzentrum (university language centre)
University of Magdeburg	Strategy: Graduate School Programmes for researchers: Graduate School course programme

Links:

- Elite Network of Bavaria:
  https://www.elitenetzwerk.bayern.de/22.0.html?&L=2
- Bavarian Elite Academy:
  www.eliteakademie.de/index_content.html#home
- Freie Universität Berlin – Dahlem Research School:
  www.fu-berlin.de/en/sites/promovieren/drs/index.html
- Friedrich Schiller University Jena – Graduate Academy:
  www.jga.uni-jena.de/index.php?id=95&L=1
- Heinrich-Heine- Universität Düsseldorf:
  - Faculty of Mathematics and Natural Sciences' Interdisciplinary Graduate and Research Academy (iGRAD):
    www.uni-duesseldorf.de/iGRAD/
  - Medical Research School (in German):
    www.medrsd.uni-duesseldorf.de/MedRSD
  - Studium Universale (in German):
    www.hhu.de/home/Zentrale_Einrichtungen/StudiumUniversale/schluesselkompetenzen
  - KUBUS (in German):
    www.phil-fak.uni-duesseldorf.de/kubus/das-kubus-programm/master-kubus/
- Philipps-Universität Marburg – Marburg University Research Academy (MARA) (in German): *www.uni-marburg.de/mara*
- Technische Universität Berlin – Centre for Scientific Continuing Education and Co-operation (ZEWK) (in German):
  www.zewk.tu-berlin.de/v-menue/wissenschaftliche_weiterbildung/
- Technische Universität München (TUM) Graduate School courses:
  http://portal.mytum.de/gs/kurse/index_html/document_view?
- University of Bamberg – Trimberg Research Academy:
  www.uni-bamberg.de/en/trac/
- Helmholtz Association – Talent Management:
  www.helmholtz.de/en/working_at_helmholtz/

Italy[12]

Institutional response

The Istituto Superiore Mario Boella described its forthcoming Strategic Plan for HR, which will target "soft skills" for researchers, with the goal of stimulating internal communication and creativity on important strategic topics. Activities for skill development will aim to support the evolution of the institute as well as researchers' careers and roles.

Research institution	Institutions: Key features
Istituto Superiore Mario Boella	Strategy: HR Strategic Roadmap Programmes for researchers: A new HR Action Plan to start 2012

Japan[13]

Japanese government response (Ministry of Education, Culture, Sports, Science and Technology)

Transferable skills training for researchers

Japan does not have an explicit strategy or agenda on transferable skills training for researchers. However, its Committee for Human Resources in Science and Technology (of the Council for Science and Technology) has released several recommendations since 2003 that implicitly and explicitly set a direction for enhancing transferable skills training in doctoral and postdoctoral training.[14] The Central Education Council has expressed a need to introduce something similar to transferable skills training in its 2005 report "Graduate School Education in the New Era" and its 2011 report "Graduate School Education in a Globalizing Society". The Ministry of Education, Culture, Sports, Science and Technology (MEXT) has developed and operated many programmes in line with such reports.

The Promotion of Internship Program for Postdoctoral Fellows was introduced in 2008 to help develop wider career paths for postdoctoral researchers and doctoral candidates, and provides systematic career development activities as well as workplace experience. It is provided through universities, and choices on the length of training and method of delivery are a university responsibility. The programme targets all transferable skills and is voluntary. A mid-term evaluation of the programme suggested activities performed jointly with a company have been important. In addition, Japan's Global COE (Centres of Excellence) programme includes training for transferable skills as part of various activities of the programme. The

programme provides funding support for establishing education and research centres with a goal of excellence and international competitiveness. It aims to enhance the education and research functions of graduate schools and to foster young researchers. The training for transferable skills is provided through universities and decisions on training length and methods are taken by these institutions.

Training for Master's-level students

No strategies or programmes for Master's-level students were described.

Workplace experience

No specific strategies or programmes for workplace experience were described. However, the Promotion of Internship Program for Postdoctoral Fellows includes opportunities for workplace experience.

Institutional responses

Three Japanese universities responded to the questionnaire. Each plays a role in delivering national government programmes that contribute to transferable skills training for researchers (such as the Global Center of Excellence Program of the Ministry of Education, Culture, Sports, Science and Technology – MEXT) and each described university-level programmes for researcher training. Some programmes have quite specific goals, such as giving students "global negotiation" skills, while others are broadly aimed at diversifying the skills of researchers and assisting their careers. Master's- and PhD-level training activities are often combined in Japan, and Nagoya University noted its Preparing Future Faculty programme is open to both groups. All the universities described internship programmes that offered workplace experience to develop the skills of doctoral candidates (as well as Master's students and post-doctoral researchers in some cases). Looking ahead, Tsukuba and Nagoya Universities are planning for transferable skills training for researchers to become more systematic.

Universities	Institutions: Key features
Nagoya University	Strategy: Mid-term Plan for FY2011-2015 Programmes for researchers: Preparing Future Faculty programme; Center for the Studies of Higher Education (CSHE) skill-up seminar series for postgraduates Master's-level training: See above – handled together with doctoral training Workplace experience: Strategy part of Mid-term Plan; offer Research Internship Programme for graduate students in engineering
Tokyo Institute of Technology	Programmes for researchers: Innovation Skill-up Program at the Productive Leader Incubation Platform Workplace experience: the Value Creating Internship programme
University of Tsukuba	Strategy: Mid-term Plan for FY2010-2015 Programmes for researchers: the Graduate General Education system; the Post-Doc Career Development program provided by the Office of Gender Equality; the Global Negotiation Program (a postgraduate certificate programme) Workplace experience: International Internship (part of the Graduate General Education system)

Links:

- Mid-term evaluation of the Promotion of Internship Program for Postdoctoral Fellows (formerly the Young Researchers Training Program for Promoting Innovation) (in Japanese): *www8.cao.go.jp/cstp/tyoutyou/20100805hyoka/siryo-1.pdf*
- Young Researchers Training Program for Promoting Innovation: *www.jst.go.jp/shincho/en/program/ino_wakate.html*
- Global COE (Centers of Excellence) Program: *www.jsps.go.jp/english/e-globalcoe/index.html*
- University of Tsukuba:
  - Graduate General Education: *www.tsukuba.ac.jp/english/education/g-courses/kyoutsuukamoku.php*
  - Global Negotiation Program: *http://gnp.hass.tsukuba.ac.jp/index.html*
- Nagoya University – Center for the Studies of Higher Education: *www.cshe.nagoya-u.ac.jp/index_en.html*

Korea

Korean government response (Ministry of Education, Science and Technology) [15]

Transferable skills training for researchers

The Korean government's 2nd National Comprehensive Plan on Nurturing and Supporting National Talents in the field of Science and Technology 2011-2015 was introduced in May 2011 with an overarching goal of increasing Korea's competitiveness by supporting creative Korean S&T talent. With respect to transferable skills, it aims to enhance employability of researchers in academia, prepare researchers for a wider labour market and improve research work.

Two training programmes are targeted at developing researchers' transferable skills. The first, the Degree and Research Centre Support Program (DRC), was introduced in 2008 with a rationale of bridging universities and government-funded research institutions and enabling staff exchange between the two sectors. Doctoral candidates can undertake six months of coursework (designed for specific research areas and incorporating transferable skills training) and two months of site work (for practical training), with the government funding the training provided by participating universities and institutes. The programme targets interpersonal, organisational and communication skills, as well as research competencies and cognitive abilities, and around 150 researchers participate each year. The second programme funded by the government, Education and Training for Fostering Experts in R&D Service Work, was introduced in 2010. It aims to improve the management of R&D activities in institutes, universities and industry, through basic and tailored training via stand-alone courses, for other early stage researchers and research personnel. The training is provided by the Korea Institute of R&DB Human Resources Development (KIRD) and is discussed further below from that institute's perspective.

Training for Master's-level students

The DRC (described above) is also open to Master's-level students.

Workplace experience

There are no specific government strategies or programmes that support the development of researchers' transferable skills through workplace experience, although the Degree and Research Centre Support Program allows for site work.

Institutional response

The Korea Institute of R&DB Human Resources Development (KIRD) is a training and educational institute funded by the Korean government. In its questionnaire response, it described examples of transferable skills training programmes for researchers and Master's-level students, under its Long-Term Development Strategy for 2020. Research competencies are a key target of many of these courses; organisational and communication skills also feature as frequent targets. KIRD also offers courses aimed at improving research and commercialisation, such as intellectual property management and R&D project management. Notably, participants contribute to the cost of KIRD's courses in a number of cases. In the future, KIRD plans to develop longer courses, and wishes to establish strong global networking and co-operation with other countries on transferable skills training and career development. Its vision is to become a global centre of excellence by 2020. Further information is presented in Box B.1.

Other organisation	Institutions: Key features
KIRD	Strategy: KIRD Long-Term Development Strategy for 2020
	Programmes for researchers: Basic competency; Leadership competency; R&D competency
	Master's-level training: English academic paper writing; Research experimental planning methods; Research data analysis
	Workplace experience: KIRD offers work-relevant courses on R&D project management, intellectual property management, and research performance commercialisation

Links:

- KIRD: *www.kird.re.kr/home/role/roadmap-en.jsp*

Box B.1. The Korea Institute of R&DB Human Resources and Development (KIRD)

KIRD, founded in 2007, provides a variety of transferable skills training programmes for researchers and staff in the public sector and government-funded institutions, and for masters and doctoral-level students and professors in universities that participate in national R&D programmes in science and technology (S&T).

KIRD's vision is to pursue global excellence in human resources management and development in S&T. KIRD directs its efforts towards the provision of systematic continuing education and training for the management of the entire R&D phase. Its training is in accordance with career development programmes and the improvement of national R&D capabilities so researchers can cope with the rapidly changing S&T environment.

Based on the three key missions of education and training, policy research and consulting, the core roles and responsibility of KIRD are:

- The development and provision of education and training programmes to R&D personnel.
- The execution of R&D personnel training and project co-ordination for co-operation between institutions.
- The establishment and operation of R&D training systems and programmes.
- Providing advice and consultations, and studies of policy strategy and research about R&D human resources development and management.
- Providing advice for planning and pursuing training projects regarding overall R&D promotion.

Ultimately, the key missions of KIRD are to enhance the productivity and efficiency of national R&D investment.

As of 2012, KIRD provides training programmes for four types of customers as well as 100 on-line courses and e-learning in the field of R&D capabilities:

- For government supported research institutes and key public research institutes in the areas of S&T, KIRD services 19 capability reinforcement training programmes for heads of institutions, high-ranked executives, appointed managers and senior level researchers and administrators, existing junior-level researchers and administrators, and newly recruited researchers and administrators.
- For professors, masters and doctorate holders, KIRD provides "capability reinforcement training programmes" for professors and project managers in charge of research at universities participating in national R&D projects, research agreement and research budget management courses, and masters and doctorate-holders courses at universities participating in national R&D projects.
- For special training programmes responding to government policy requests related to industry, academic research institutes, and government, KIRD provides six courses such as the "R&D specialized human resources cultivation course", national R&D management specialist courses, administrator courses for developing a safe environment in research labs, large scale national R&D project leader courses for understanding all phases of R&D, and district S&T innovation courses.
- For researchers working in mid-sized enterprises with national R&D projects, KIRD provides customer-friendly tailored courses and a variety of courses centered on R&D planning and performance expansion for commercialisation.

KIRD also provides three "categorized capabilities" training programmes for researchers and administrators:

- For R&D capability training, KIRD provides 18 training courses such as "reinforcement of specialised knowledge for the entire R&D phase", and "planning strategies for R&D policies, management and the assessment of executing and expanding performance on the basic principle of a 'plan-do-see' R&D cycle".
- For common R&D capability training, KIRD provides seven training courses such as planning for retirement, creative thinking and science communication.
- For essential capability training in accordance with the law on establishing a safe environment for research labs and regulations on the management of national R&D projects, KIRD provides four training courses, namely project funding management, research notes and ethics, research safety and research security.

Source: Information provided by KIRD.

Luxembourg[16]

Luxembourg government response (Ministry of Higher Education and Research)

Transferable skills training for researchers

The Luxembourg government currently has no overarching strategy or agenda regarding formal transferable skills training for researchers, and no formal training programmes for developing researchers' transferable skills. Training for researchers is within the remit of the Fonds National de la Recherche (FNR – National Research Fund).

Training for Master's-level students

There are no government strategies or programmes for formal transferable skills training for Master's-level students.

Workplace experience

There are no government strategies or programmes that support the development of researchers' transferable skills through workplace experience.

International co-operation

The Ministry of Higher Education and Research is an active member of the ERA Steering Group for Human Resources and Mobility and of different fora of the OECD dealing with research career development activities.

Institutional response

A questionnaire response was received from Luxembourg's Fonds National de la Recherche (FNR – National Research Fund), a public body that develops and implements various funding instruments to support researchers, develop the research environment and promote a scientific culture. The FNR is currently developing a joint strategy for the development of researchers' skills, together with partners from Luxembourg's public research sector. This aims at a co-ordinated approach that provides adequate training of young researchers, in line with the European Charter and Code of Conduct for recruitment of researchers. As well as delivering government funding that supports training activities, FNR also offers training programmes for researchers and supports schemes for workplace experience. Looking ahead, the FNR is working with institutions to make transferable skills training opportunities a core component for doctoral and postdoctoral researchers receiving FNR research funding, and beneficiaries of AFR

(Aides à la Formation – Recherche) grants will be required to agree a training plan with their supervisors. At a national level, it is planned to conduct an analysis of training needs, identify gaps, and set up a common training agenda for all researchers from Luxembourg's public research institutions, with additional FNR courses organised if necessary.

Other organisation	Institutions: Key features
Fonds National de la Recherche	Strategy: under development Programmes for researchers: Project Management course for PhD and post-docs; Grant Proposal Writing seminars (for the FNR CORE programme and FP7 Marie Curie individual fellowships); Communication with the media Workplace experience: AFR funding scheme for PhD and Postdocs – Public Private Partnerships; State aid for temporary secondment of highly qualified people

Links:

- Fonds National de la Recherche: *www.fnr.lu/*

New Zealand[17]

New Zealand government response (Ministry of Science and Innovation)

Transferable skills training for researchers

The New Zealand government currently has no overarching strategy or agenda regarding formal transferable skills training for researchers, and no formal training programmes for developing researchers' transferable skills.

Training for Master's-level students

There are no government strategies or programmes for formal transferable skills training for Master's-level students.

Workplace experience

There are no government strategies or programmes that support the development of researchers' transferable skills through workplace experience.

Institutional responses

Three research institutions in New Zealand responded to the questionnaire. Two have strategies and programmes for transferable skills training for their research personnel, which are focused on leadership and collaboration. One of these institutions also noted it delivers national government programmes (post-doctoral scholarships and postgraduate study, in conjunction with universities) and offers opportunities for workplace experience, both within the research institution (for guest researchers) and in other organisations (for their own staff). The third institution is currently reviewing its approach to career development and will consider transferable skills as part of this.

Four universities also provided information on their approach to transferable skills training for researchers. Three have a strategy/agenda for transferable skills, either explicit or implicitly embedded in other strategic documents, and one is currently developing a strategy. Each university offers training programmes for researchers, aimed at doctoral students (*e.g.* the University of Auckland's Doctoral Skills Programme) as well as academic staff (*e.g.* the Auckland University of Technology's Leadership and Management Enhancement Programme). Two universities have strategies for Master's-level training, related to Graduate Profiles (documenting expected attributes of graduates), and three have training programmes. Three universities offer workplace experience opportunities; these relate both to students gaining experience in industry settings as well as to students or recent graduates gaining academic career-related experience in the university. Two of the universities signalled international links, including via the provision of a course developed by the Australian Group of Eight universities.

Research institutions	Institutions: Key features
Landcare Research New Zealand Ltd	Currently reviewing approach to career development
New Zealand Institute for Plant & Food Research	Strategy: Leadership Development Programmes for researchers: Leadership Programme
Scion	Strategy: People, Performance and Culture Plan 2011-2016 Programmes for researchers: Radical Collaboration; Belbin teams Workplace experience: a sabbatical programme (inward and outward); funding and work placement for post-doctoral scholarships
Universities	
Auckland University of Technology	Strategy: the AUT Strategic Plan Programmes for researchers: the Academic Practice series; AUT Leadership and Management Enhancement Programme (LMEP) Master's-level training: KEYS to Academic Success courses; courses at Te Tari Āwhina – Learning Development Centre Workplace experience: consistent with the Strategic Plan, offers positions for Graduate Assistants, short-term Postdoctoral Fellowships, and various work placement/co-operative education schemes in study programmes
University of Auckland	Strategy: The Doctoral Skills Programme, deriving from Graduate Profiles. Programmes for researchers: Doctoral Academic Career module; courses under the Doctoral Skills Programme; the Future Research Leaders programme Master's-level training: Faculty-level approaches, consistent with Graduate Profiles. Offer Master's programmes that incorporate industry contact/internships, such as the Postgraduate Diploma of Bioscience Enterprise and Master of Bioscience Enterprise, the Master of Engineering Studies (Medical Devices and Technologies) and the Master of International Business.
University of Canterbury	Strategy: A graduate profile for PhD candidates is currently under development. Programmes for researchers: Transferable Research Skills (introduction 2012); Career Planning for the Early Career Academic Master's-level training: Approaches derive from Graduate Profiles developed for each college. Programmes include a Graduate Certificate in Science and Entrepreneurship, a Research Methods paper, and the University of Canterbury Entrepreneurship Challenge. Workplace experience: Approaches are college-dependent. Programmes include Engineering Practical Work Experience; opportunities within the National ICT Innovation Institute; and an Arts Internship programme.
University of Otago	Strategy: Implicit approach contained in university documents (*e.g.* Strategic Direction to 2012, the Teaching and Learning Plan) Programmes for researchers: Professional Development programme; Preparing for Academic Careers; The Research Journey

Links:

- University of Auckland:
  - Graduate profiles:
    www.auckland.ac.nz/uoa/home/about/teaching-learning/principles
  - Doctoral Skills Programme:
    www.auckland.ac.nz/uoa/home/for/current-students/cs-current-pg/cs-dsp
  - BioScience Enterprise qualifications:
    www.biotech.co.nz/enterprise-training/
  - Master of Engineering Studies – Medical Devices and Technologies:
    www.engineering.auckland.ac.nz/webdav/site/engineering/shared/for/future-postgraduates/study-options/documents/mengst-med-dev-tech.pdf
  - Master of International Business:
    www.business.auckland.ac.nz/uoa/home/for/future-postgraduates/study-options-7/postgraduate-programmes-1/mintbus-quick-facts
- University of Canterbury Entrepreneurship Challenge:
  www.entre.canterbury.ac.nz/
- University of Otago – Higher Education Development Centre:
  http://hedc.otago.ac.nz/hedc/home.html

Norway[18]

Norwegian government response (Ministry of Education and Research)

Transferable skills training for researchers

The Norwegian government currently has no overarching strategy or agenda regarding formal transferable skills training for researchers, and no formal training programmes for developing researchers' transferable skills. The Ministry of Education and Research suggested the generally good labour market outcomes for doctorate holders in Norway partly explain the (so far) limited focus by government on this type of training. However, transferable skills may be one of the issues considered in the process leading up to the new White Paper on research.

Training for Master's-level students

The Norwegian government introduced a strategy for entrepreneurship skills (Entrepreneurship in Education and Training: 2009-2014) for students from compulsory school level through to higher education. This followed an earlier scheme (See the Opportunities and Make them Work!) launched in 2004. These educational programmes form part of an effort to make Norway a leader in entrepreneurship and target skills related to communication, innovation and ethics. An important initiative is closer contact between education and employment.

Workplace experience

The Norwegian government introduced an Industrial PhD scheme in 2008, designed to equip researchers with industry-relevant knowledge as well as enhance interaction between companies and research institutions and increase research activity in industry. The scheme targets several transferable skill groups – interpersonal skills, organisational skills, cognitive skills and enterprise skills. During the three-year programme, candidates are employed in companies, although are obliged to spend one year in total in an academic institution, and financing is equally shared between the government and the host company. As at August 2011, 87 candidates were enrolled in the scheme.

International co-operation

At the Nordic level, Norway takes part in NordForsk – an organisation promoting Nordic research collaboration and which offers a Nordic industrial PhD (the PPP – Private Public Partnership) as well as several

research training courses for PhD students and young post-doctoral researchers. At the European level, Norway participates in numerous forums/programmes related to researchers and skills, including the ERA Steering Group for Human Resources and Mobility, EURAXESS, the ESF, EU FP7 Marie Curie Actions and EUROHORCs.

Institutional responses

Five research institutes responded to the questionnaire. One indicated no activity in transferable skills, as it collaborates with another organisation that provides any required training. Another had no specific strategies or programmes, but noted its expectation that researchers are familiar with business (commenting that collaboration with industry helps build transferable skills). The remaining three institutes have their own strategies; in two cases, these were accompanied by training programmes for staff. Two institutes also noted that they deliver government programmes for transferable skills, namely doctoral training and internships, and that they host Master's-level students. (The Ministry of Education and Research noted there is work in progress to further develop the role of independent research institutes in Norwegian doctoral education.) With respect to workplace experience, one institute is involved in the Industrial PhD programme, and another encourages visits to other (especially foreign) research institutes and universities.

Five universities participated in the questionnaire, giving four university-level responses and four department/faculty-level responses. One university indicated it delivers national programmes for training via financing of PhD fellowships and implementing the requirements of the Bologna Process. Three of the four universities have strategies for transferable skills training for researchers, as part of their overall university-level strategies, and all have programmes for researchers. Three of the four departments/faculties also provide training programmes. More than half of the programmes were aimed specifically at doctoral candidates; communication skills and research competences were the most frequent targets. Most programmes are voluntary, although several courses related to pedagogy, ethics and research design were compulsory. The universities suggested that training may become more systematic in the future, and several mentioned the introduction of the Norwegian national qualifications framework[19] in 2012 as a likely driver of change. Two universities described international links related to researcher career development (in particular, European-level connections).

Master's-level training is encompassed within the general strategies of two universities, and three universities have transferable skills programmes for these students; changes were indicated, with more systematic and a

greater variety of training likely to be available. One university mentioned that good training for Master's students could help encourage research careers. Only the Norwegian University for Science and Technology has a strategy for training via workplace experience, included within its general strategy, and offers an Industrial PhD programme. None of the departments/faculties described Master's training or workplace experience schemes.

In addition to the information provided by universities, the Ministry of Education and Research mentioned that an established practice in Norwegian higher education is that of "adjunct professors" and "adjunct associate professors", where persons whose main occupation is outside of the academic institution (*e.g.* they are employed in industry, research institutes or hospitals or in another academic institution) may take up an additional part-time academic position (usually around 20% FTE). These positions are used to connect universities and university colleges with specialist competencies and aim to strengthen teaching, research co-operation and knowledge transfer. At the individual level, such professorships can contribute to developing transferable skills, especially when the professorship is cross-sector. The total number of shared professorships in the higher education sector is around 1 100, compared to 3 100 full professors. The practice is sanctioned by the University Act and operative responsibility lies with academic institutions. This practice was mentioned in the questionnaire response from the Norwegian University of Science and Technology.

Research institutions	Institutions: Key features
Centre for Rural Research	Strategy: Development of Scientific Skills Master's-level training: Hosts Master's students Workplace experience: Encourages visits to other institutes and universities, and hosts PhD candidates
Nofima	Strategy: PhD programme Programmes for researchers: Leadership programme; Project Managers programme Master's-level training: Hosts Master's students Workplace experience: Participates in Industrial PhD programme; finances researchers to visit foreign research institutions; hosts PhD students
Northern Research Institute Narvik	Workplace experience: Expect researchers to be familiar with business and have industry experience.
Peace Research Institute Oslo	Strategy: HR Guidelines Programmes for researchers: Academic writing; Media training
SNF – Institute for research in economics and business administration	No need for own activities as SNF collaborates with the Norwegian School of Economics on training.

Universities	Institutions: Key features
Norwegian University of Life Sciences – Research Department	Strategy: Strategy 2010-2013 for the Norwegian University of Life Sciences (ref: PhD education) Programmes for researchers: Job seeking workshop; Intellectual Property Rights and Innovation; How to write a competitive proposal to the EU framework programmes Master's-level training: An Entrepreneurship camp and programme on Mentoring for Young Start-up Companies in the region. Currently developing a university qualifications framework (based on the national framework) that will include transferable skills. Workplace experience: The qualifications framework under development will have implications for workplace experience.
Norwegian University of Life Sciences – Department of Mathematical Sciences and Technology	No activity at the departmental level
Norwegian University of Science and Technology (NTNU)	Strategy: NTNU Strategy 2011-2021 – "Knowledge for a better world" Programmes for researchers: Academic Leadership programme; Equal Opportunities Mentor programme; Pedagogical Development programme Master's-level training: Part of the NTNU Strategy. Programmes include Experts in Teamwork, a Researcher Programme for medical students, and the Entrepreneurship Venture Cup. Workplace experience: As well as hosting research fellow positions, NTNU participates in the Industrial PhD programme.
University of Bergen, Faculty of Natural Sciences	Programmes for researchers: Theory of Science and Ethics; Knowledge Transmission; Publishing Issues and Information Use for PhD candidates
University of Bergen, Faculty of Psychology	Programmes for researchers: Scientific and Scholarly Writing; Design and Conduct of Research
University of Bergen, Faculty of Social Sciences	Programmes for researchers: Philosophy of Social Science and Research Ethics; Academic Writing and Publication
University of Oslo	Strategy: Strategy 2020; Action Plan for Academic Staff 2010-2012 Programmes for researchers: Research Leadership programme; Innovation and Intellectual Property Rights; Project Management and the Project Method Master's-level training: Part of the university strategy. Activities include Media Students in the Workplace, Project Work – Leadership and Organisation, Human Rights in Practice
University of Stavanger	Programmes for researchers: UNIPED (university pedagogy); English Presentation Techniques course; Writing for Scholars

Links:

- Industrial PhD programme:
  www.forskningsradet.no/servlet/Satellite?c=Page&cid=1253952592752&p=1253952592752&pagename=naeringsphd%2FHovedsidemal
- Private Public Partnership (PPP):
  www.nordforsk.org/en/funding/finansieringsformer/private-public-partnership-ppp-phd
- Norwegian University of Life Sciences – Strategy 2010-2013:
  www.umb.no/statisk/om-umb/strategi_umb_2010-13.pdf
- Norwegian University of Science and Technology:
  - Pedagogical Development (in Norwegian):
    www.ntnu.no/plu/uniped/pedup
  - Experts in Teamwork programme: *www.ntnu.edu/eit/main-page*
  - Researcher programme for medical students (in Norwegian):
    www.ntnu.no/dmf/forskerlinjen/forskerlinjestudiet
- University of Bergen – Faculty of Natural Sciences – course on Theory of Science and Ethics:
  www.uib.no/course/MNF490#introduction
- University of Oslo:
  - Strategy 2020 and Action plan for staff:
    www.uio.no/english/about/strategy/ and
    www.uio.no/english/for-employees/support/human-resources/personnel-policy/uio-workingconditions-academicstaff/actionplan-researchers.html
  - Research Leadership Programme:
    www.uio.no/english/for-employees/competence/leadership-development/leadership-support/development-programme/research-leaders/index.html

Poland[20]

Polish government response (Ministry of Science and Higher Education)

Transferable skills training for researchers

While there is no strategy explicitly aimed at formal transferable skills training in Poland, the EU-funded Human Capital Operational Programme (2007-2013) includes some objectives that bear on transferable-type skills. In particular, under Priority IV (Tertiary Education and Science), Measure 4.2 calls for "Development of R&D system staff qualifications and improving the awareness of the role of science in economic growth". Related projects aim to improve staff competences in managing large scientific projects and commercialising their results. Marketing skills and promotion of industrial and intellectual property protection are also targeted. Funding under the Programme has been used to create postgraduate studies to raise research management skills (*e.g.* "R&D management in research institutions" at the John Paul II Catholic University of Lublin, and "Professional head of research and development projects – postgraduate studies for researchers" at the University of Agriculture in Krakow). A new initiative is the "Government Strategy of Innovation and Efficiency of the Economy for 2012-2020", or "Dynamic Poland". Action 2.1.3, Training of Young Researchers, includes enhancing the quality of research management and covers upgrading the skills of managers and administrators engaged in research projects. In another example, a recently announced programme (the "Top 500 Innovators – Science – Management – Commercialisation") will allow 500 Polish researchers to take internships in top universities abroad for training in research, research management and research commercialisation.

Workplace experience

There are no explicit government strategies or programmes that support the development of researchers' transferable skills through workplace experience, although the fore-mentioned Human Capital Operational Programme includes some objectives that bear on such activities.

Wider research career development agenda

There are numerous programmes aimed at supporting career development in a wide sense. These include programmes for doctoral candidates, young researchers, researchers returning from abroad or from career breaks, and foreign researchers.

International co-operation

The Polish government supports career development via the international mobility of researchers (*e.g.* the Mobility Plus programme).

Institutional responses

In university responses, the Wroclaw University of Economics (Faculty of Management, Computer Science and Finance) noted it offers a pedagogical programme to prepare young researchers for teaching, and plans ongoing development of training. Certificate-level courses that target particular skills (*e.g.* business competences) are offered to Master's students. No workplace experience activities are currently offered, but this may change in future.

The Foundation for Polish Science (FNP) also responded to the questionnaire. It delivers the part-EU-funded SKILLS programme on behalf of the Polish government. Training activities under this programme aim to strengthen R&D staff potential in science administration, research management and communication. The whole programme runs for five years and courses are aimed at laureates and scholars of the Foundation's scholarship programmes (especially research team leaders and PhDs). In future, the Foundation may continue the training activities using its own funds. International co-operation is part of the SKILLS programme delivery, with foreign partners contributing to training.

University	Institutions: Key features
Wroclaw University of Economics – Faculty of Management, Computer Science and Finance	Programmes for researchers: Pedagogical Programme Master's-level training: In addition to formal diplomas, the university offers certificates in certain skills *e.g.* the European Business Competency Licence.
Other organisation	
Foundation for Polish Science	Programmes for researchers: Delivery of the SKILLS programme for the Polish government Workplace experience: Internships are included in some SKILLS programme activities.

Links:

- Dynamic Poland (in Polish): *http://bip.mg.gov.pl/files/upload/15929/2.%20PL_MG_MG_KRM_SIEG_20120403_w%200.16.pdf*
- Human Capital Operational Programme: *www.nauka.gov.pl/financing/european-funds/human-capital/*

- Top 500 Innovators – Science – Management – Commercialisation (in Polish): *www.nauka.gov.pl/ministerstwo/aktualnosci/aktualnosci/artykul/top-500-innovators-science-management-commercialization/*
- Mobility Plus programme: *www.nauka.gov.pl/ministry/international-cooperation/mobility-plus/*
- Foundation for Polish Science – SKILLS programme (in Polish): *www.fnp.org.pl/programy/aktualne_programy_fnp/program_skills*

Slovenia[21]

Slovenian government response (Ministry of Higher Education, Science and Technology)

Transferable skills training for researchers

The Slovenian government has no overarching strategy or agenda regarding formal transferable skills training for researchers and no formal training programmes. Doctoral study programmes are guided by the Higher Education Act, which specifies the general abilities students should acquire through the programmes.

Training for Master's-level students

There are no government strategies or programmes for formal transferable skills training for Master's-level students. The scope of Master's programmes is set by the Higher Education Act.

Workplace experience

One goal of Slovenia's Research and Innovation Strategy 2011-2020 is to prepare researchers for a wider labour market. A programme introduced in 2007 and aimed at doctoral students – Young researchers in companies (or "Young Researchers for Economy") – aims to promote the transfer of research between academia and business and targets students' research competencies and enterprise skills. The voluntary programme has around 70 participants per year and is funded by the government. The training runs for the time of the doctoral studies. In addition, in 2010 a new scheme involving workplace experience – "Programme for Strengthening R&D Personnel in Companies" – was introduced. The scheme is a joint effort by the Ministry of Higher Education, Science and Technology and the Ministry of Economy and aims at strengthening research units in companies and their potential for innovation. It provides for training of young researchers in

companies and thus supports development of transferable skills via workplace experience. As well as the engagement of industrial PhDs, the scheme covers engagement of new or guest researchers and the establishment of new topic-oriented research groups. Placement of researchers from universities into firms may occur where there is a wish to develop a new idea with commercial potential. Funding comes from the national government and EU Structural Funds.

International co-operation

The Ministry of Higher Education, Science and Technology co-operates, on behalf of the Slovenian government, with the European Commission on issues related to FP7 and participates in various working groups and bodies. Slovenia participates in the European Partnership for Researchers process, via its membership of the EC Steering Group on Human Resources and Mobility. The Ministry also implements various bilateral and multilateral programmes of co-operation relevant to researcher career development.

Turkey

Turkish government information (TÜBİTAK)[22]

Developing science and technology human resources is one of the main pillars of Turkish science, technology and innovation (STI) policy and is one of the horizontal axes of the National Science Technology and Innovation Strategy 2011-2016. A Science and Technology Human Resources Strategy and Action Plan 2011-2016 is in place, which includes a strategic objective of "improving research environment, researchers' skills and experience". This objective speaks directly to the aim of transferable skills training for researchers, with related strategies and actions including the following:

- Designing mechanisms for improving researchers' skills
- Designing and promoting research methodologies and R&D project management courses and training for graduate students
- Providing courses and training for improving soft skills such as leadership, science communication and language skills
- Promoting interdisciplinary work and collaboration

As well as the development of STI human resources, the National Science, Technology and Innovation Strategy has two further axes that relate to transferable skills – "Stimulate the Transformation of Research

Results into Products and Services", which includes designing and implementing patent training programmes for researchers, and "Diffusion of a Multi-actor and Multi-discipline R&D Co-operation Culture". In addition, the main theme of the Supreme Council for Science and Technology (SCST) meeting on 27 December 2011 was the National Innovation and Entrepreneurship System and steps to be taken to foster this system. Two of the eight decrees adopted at the meeting (promotion of an entrepreneurship culture, and developing policy tools to trigger innovation and entrepreneurship in universities) comprise transferable skills training for researchers.

The Scientific and Technological Research Council of Turkey (TUBITAK) has a wide range of funding programmes for researchers to develop their careers, skills and experience. These programmes range from national and international PhD and post-doc scholarships to short-term research scholarships in international universities and research centres.

Response from the Turkish Ministry of Health – Turkish School of Public Health[23]

At the Ministry level, a policy questionnaire response was received from the Turkish Ministry of Health (Turkish School of Public Health).

Transferable skills training for researchers

The Ministry of Health (School of Public Health) has an agenda to build the capacity of human resources for health and to undertake training, research and other tasks to develop the Ministry's general health policies. This agenda was introduced in 2003 with a rationale to support, motivate and train human resources in health, undertake health research, and produce knowledge to improve health care services. Its goals include improving research work (including the academic quality), and supporting management processes.

Several programmes are offered to Turkish School of Public Health research personnel that target transferable skills. The "Basic Managerial Skills" programme was introduced in 2007 and aims to support management and research personnel. Training is provided by universities via distance education, for a period of two months, and around 22 school research personnel participate each year. The programme addresses interpersonal, organisational and communication skills, as well as research competencies and cognitive abilities. The "Personnel Development Training" programme was introduced in 2005 and provides 3-7 days per year of compulsory lectures and activities to School research personnel. Interpersonal, organisational, communication and enterprise skills are targeted, as well as cognitive abilities. Around 20-30 personnel participate each year, with training

provided by universities and private firms. The "Research Methods in Health Care Training" programme was introduced in 2010 to support skills in research planning, literature review, data collection and analysis and research reporting. Compulsory lectures are provided by universities in three five-day modules, and target research competencies and communication skills. Around 30 School research personnel participate per year. The programmes are all jointly funded by the World Bank and the Turkish government.

Looking ahead, there are plans to build a database about development skills.

Training for Master's-level students

The Ministry of Health has no strategies or programmes for formal transferable skills training for Master's-level students.

Workplace experience

The Ministry of Health has no strategies or programmes that support the development of researchers' transferable skills through workplace experience.

International co-operation

The Ministry of Health has a budget and programme to train personnel abroad.

Links

- National Science, Technology and Innovation Strategy 2011-2016: *www.tubitak.gov.tr/sid/2415/pid/2400/index.htm*
- Science and Technology Human Resources Strategy and Action Plan 2011-2016: *www.tubitak.gov.tr/sid/2416/pid/2400/index.htm*
- SCST meeting held on 27 December 2011: *www.tubitak.gov.tr/sid/2400/pid/2400/cid/26210/index.htm*

United Kingdom

United Kingdom government information (Department of Business, Innovation and Skills)[24]

The United Kingdom government itself does not have a specific strategy or programmes aimed at transferable skills for researchers. In the United Kingdom, government funding for teaching and research is allocated by funding bodies and research councils[25] who have their own governance structures and funding allocation mechanisms. These bodies' strategies can include transferable skills for researchers – for instance, the RCUK (Research Councils UK) states that it will ensure its funding develops the right balance of specialist research expertise and wider business and management skills for high-technology employers as well as academia. It also has a statement of expectations for research organisations that receive funding, including that organisations will act to maintain availability of a broad range of career planning, training and development opportunities for Research Council funded researchers and to fully embed researcher development into normal processes in the research and training environment.

There are a number of overarching documents/agreements that bear on transferable skills training for researchers in the United Kingdom. Together with other stakeholders in the higher education sector, the funding bodies and research councils have signed a "Concordat to Support the Career Development of Researchers". This document sets standards for career management and conditions of employment for researchers employed by higher education institutions or funded through grants and analogous schemes. The sector has also endorsed the Researcher Development Statement (RDS), which is a strategic statement setting out the knowledge, behaviours and attributes of effective and highly skilled researchers appropriate for a wide range of careers. The RDS is derived from the Researcher Development Framework (RDF), which is an operational framework identifying the characteristics of excellent researchers through a set of 63 "descriptors" related to knowledge, intellectual abilities, techniques and professional standards to do research, as well as personal qualities, knowledge and skills to work with others and ensure the wider impact of research.[26] The RDS supports higher education institutions in their implementation of the Concordat, the QAA (Quality Assurance Agency) Code of Practice for assurance of academic quality and standards in postgraduate research degrees, and the "Roberts recommendations" for postgraduate researchers and research staff (see Box B.2). The RDS/RDF also help researchers themselves consider their competencies and opportunities for development.

Box B.2. The Roberts Report

The emphasis on personal and professional development for postgraduates was boosted by a review of the sector by Sir Gareth Roberts, which led to increased investments in science and research by government. The recommendations of the so-called "Roberts Report" included a ring-fenced budget of GBP 100 million a year in the Comprehensive Spending Review in 2002. Part of this funding was dedicated to ensuring that Research Council-funded PhD students and postdoctoral researchers had access to significantly improved training opportunities to develop further the transferable skills important to employers. The funding, managed by RCUK, delivered around GBP 20 million a year between 2003 and 2010 for development and transferable skills training. Evaluations and progress reports on the uses and impacts of these investments were positive. Some further information can be found in the links noted below.

The Concordat has led to different initiatives at the institutional level. A summary of progress can be found in the annual report on the implementation of the Concordat (see links below). The work of Vitae (see institutional responses below) is significant in this respect. In addition, doctoral training centres such as those funded by the Engineering and Physical Sciences Research Council deliver transferable skills as well as technical competencies to students. In 2009 the EPSRC funded 45 new centres for doctoral training, which bring together diverse areas of expertise to provide multidisciplinary training for engineers and scientists. Students at doctoral training centres undertake a four-year PhD course or equivalent, with an original research project, a programme of coursework to develop technical interdisciplinary skills, and other activities to develop breadth of knowledge plus transferable skills (*e.g.* public engagement). Engineering doctorate and industrial doctorate centres offer an alternative approach, with 75% of students' time being spent working directly with a company.

Institutional responses[27]

Two universities individually responded to the questionnaire. One is involved in delivering a government training initiative for early career researchers, by acting as a host and manager of "Scottish Crucible" events. Both have an agenda for researcher development and offer programmes in transferable skills to all levels of researchers. A number of the programmes commenced with financing from "Roberts funding" – a funding stream for transferable skills training in the United Kingdom, which ceased in its existing form in 2011. Both universities expected future changes, with one looking at reorganising its infrastructure for development activities. Neither provided information about Master's-level training or workplace experience; however, Strathclyde's Researcher Development Programme offers opportu-

nities for internships and an internship programme is under consideration, while workplace experience is also under discussion at Stirling.

In addition, the Russell Group provided information about support for staff development in Russell Group universities.[28] Russell Group universities provide a range of training opportunities, including:

- Diplomas/certificates in teaching (*e.g.* the University of Liverpool's Postgraduate Diploma in Learning and Teaching in Higher Education);
- Development for staff with teaching responsibilities (*e.g.* the University of Bristol's Teaching and Learning in Higher Education course);
- Training programmes for postgraduate and post-doctoral research staff (*e.g.* the University of Leeds' Graduate Training and Support Centre offers courses in leadership and management, knowledge transfer, personal development, *etc*);
- Training for postgraduate and post-doctoral staff with teaching responsibilities (*e.g.* the University of Birmingham's training module in teaching skills for research staff); and
- Courses on academic practice (*e.g.* the University of Oxford's Developing Academic Practice course).

A questionnaire response was also received from Vitae. This organisation supports the personal, professional and career development of doctoral researchers and research staff in higher education institutions and research institutes in the United Kingdom. It acts as a facilitator (for example, managing events, bringing together stakeholders, providing opportunities to share best practice), information provider and developer of resources for use by trainers. It is funded by Research Councils UK. Vitae described three programmes; two aimed at doctoral candidates and one for all researchers. Experiential learning is a key component of the programmes, and they target the full range of transferable skills. While no specific workplace experience programmes are in operation, Vitae is currently developing an employer engagement strategy. Looking ahead, Vitae aims to support a "cultural shift", such that training in transferable skills becomes a comprehensive part of doctoral programmes and research activity. The organisation engages extensively on a European level (*e.g.* it is working with the European Science Foundation to evaluate the feasibility of using the Researcher Development Framework more widely in Europe), and also has interaction with the United States.

Universities	Institutions: Key features
Russell Group universities	Programmes for researchers: Many examples, as outlined above.
University of Stirling	Strategy: To implement the Concordat to Support the Career Development of Researchers and Vitae's Researcher Development Framework Programmes for researchers: The Graduate School Seminar Programme; Researcher Development Programme; Effective Research Supervision
University of Strathclyde	Strategy: Researcher Development Strategy and Operational Plan 2011-2015 Programmes for researchers: Researcher Development Programme
Other organisation	
Vitae	Strategy: SET for Success – The supply of people with science, technology, engineering and mathematics skills 2002 Programmes for researchers: GRADschools programme; How to be an effective researcher; Leadership in Action

Links:

- Research Concordat: *www.researchconcordat.ac.uk*
- 1st annual report on implementation of the Concordat: *www.researchconcordat.ac.uk/documents/FundersForumDecember09.pdf*
- Roberts Report:
  - *www.rcuk.ac.uk/ResearchCareers/researcherdevelopment/Pages/ImplementingRobert.aspx*
  - *www.1994group.ac.uk/documents/public/Research_Policy/090115_RobertsFundReport.pdf*
- University of Strathclyde – Researcher Development Programme: *www.strath.ac.uk/rdp/*
- Vitae: *www.vitae.ac.uk/policy-practice/167/Home.html*
  - GRADschools programme: *www.vitae.ac.uk/gradschools*
  - Vitae "How to be an effective researcher": *www.vitae.ac.uk/effectiveresearcher*
  - Vitae "Leadership in Action" course: *www.vitae.ac.uk/researchers/104253/Leadership-in-Action.html*

United States

United States federal government information (National Science Foundation)[29]

There are no specific government-level strategies or programmes directly aimed at building transferable skills in researchers in the United States. Programmes to develop transferable skills for researchers are managed by individual federal agencies or departments, and policies are programme-specific. However, the United States Office of Science and Technology Policy (OSTP) has responsibility for providing leadership for interagency efforts to develop and implement sound science and technology policies and budgets, and to work with the private sector, state and local governments, the science and higher education communities, and other nations toward this end. This OSTP leadership involves workforce development at all levels, including transferable skills for researchers.

Some examples of departments/agencies and the programmes they manage are:

- National Science Foundation (NSF): The NSF has a broad mandate in supporting the science and engineering fields. It has general requirements that proposals for funding to support postdoctoral researchers must include a description of mentoring activities, and each institution that applies for financial assistance must describe its plans for training and oversight in the responsible and ethical conduct of research. In specific activities, NSF's Integrative Graduate Education and Research Traineeship (IGERT) programme has been developed to educate United States PhD scientists and engineers with interdisciplinary backgrounds, deep discipline-specific knowledge and technical, professional and personal skills. Its Science Master's programme prepares graduate students for careers in business, industry, non-profit organisations and government agencies by providing a foundation in science, technology, engineering and mathematics disciplines plus research experiences, internship experiences and career skills.
- Air Force Office of Scientific Research (AFOSR): The United States Air Force sponsors programmes in support of its mission; as such, the AFOSR sponsors research assistantship programmes, faculty programmes and graduate school programmes. These are intended to support graduate education, to encourage development of research excellence in critical technological areas where research facilities and qualified researchers are lacking, to train personnel to conduct high quality research and to stimulate mutual research interests between the Air Force and higher education institutions.

- United States Department of Energy (DOE): The DOE also sponsors programmes to support its mission. For instance, it sponsors a graduate fellowship programme to support students to pursue graduate training in basic research in areas of physics, biology, chemistry, mathematics, engineering, computational sciences, and environmental sciences relevant to the DOE mission and to develop talent in the United States. Another example is the DOE Minority Educational Institution Partnership Programme, which offers undergraduate and graduate students summer internship positions with the DOE and its national laboratories.

- The United States National Institutes of Health (NIH) sponsor health-related programmes. For example, the NIH offers summer programmes where researchers can work with leading scientists in the biomedical research area. It also sponsors the NIH Graduate Partnerships Programme, which gives graduate students the opportunity to conduct all or part of their dissertation research at the NIH. Students come to the NIH either as part of formal institutional partnerships or via individual agreements negotiated between their university mentor and an investigator at the NIH. Another example is the NIH Ruth L. Kirschstein National Research Service Award – Institutional Research Training Grants, which support predoctoral and postdoctoral research training to help boost the workforce available to assume leadership roles related to the United States' biomedical, behavioural and clinical research agenda.

Notes

1 Information from the policy questionnaire.

2 Information supplied by RIHR delegate.

3 Information from policy questionnaires.

4 Information supplied by RIHR delegate.

5 Information from policy questionnaire.

6 Information from policy questionnaires.

7 Information from policy questionnaires.

8 Information from policy questionnaires.

9 Information supplied by RIHR delegate.

10 Information from policy questionnaires.

11 From: Bavarian State Ministry of Sciences, Research and the Arts; Thuringian Ministry of Education, Science and Culture; Ministerium für Bildung, Wissenschaft, Weiterbildung und Kultur (Rhineland Palatinate); Senatsverwaltung für Bildung, Wissenschaft und Forschung Berlin; Behörde für Wissenschaft und Forschung (Hamburg); Senatorin für Bildung, Wissenschaft und Gesundheit (Bremen); Ministerium für Wissenschaft und Wirtschaft des Landes Sachsen-Anhalt; Ministerium für Wissenschaft, Forschung und Kultur des Landes Brandenburg; and Ministerium für Wissenschaft, Forschung und Kunst Baden-Württemberg.

12 Information from policy questionnaire.

13 Information from policy questionnaires.

14 Updated information from RIHR delegate: In December 2011, the Committee issued a recommendation that young postdoctoral fellows employed with public research funding from the Ministry of Education, Culture, Sports, Science and Technology (MEXT) must receive certain support from their employers, including action plans to support their careers (including, for example, lectures conducted in co-operation with companies, internships, exchange meetings with companies, *etc*). The Committee also suggested that public research institutions should provide doctoral researchers who do not qualify for this policy with access to similar career development activities.

15 Information from policy questionnaires.

16 Information from policy questionnaire.

17 Information from policy questionnaires.

18 Information from policy questionnaires.

19 This framework is a Norwegian adaptation of the European Qualifications Framework that is being put into practice across Europe. See *http://ec.europa.eu/education/lifelong-learning-policy/doc44_en.htm* (accessed 19 January 2012).

20 Information from policy questionnaires.

21 Information from policy questionnaire and RIHR delegate.

22 Information supplied by RIHR delegate.

23 Information from policy questionnaire.

24 Information supplied by RIHR delegate.

25 Funding bodies include, for example, the Royal Society, the Arts Council, and NESTA. There are seven research councils under the umbrella of Research Councils UK (RCUK): Arts and Humanities Research Council (AHRC); Biotechnology and Biological Sciences Research Council (BBSRC); Economic and Social Research Council (ESRC); Engineering and Physical Sciences Research Council (EPSRC); Medical Research Council (MRC); Natural Environment Research Council (NERC); and Science and Technology Facilities Council (STFC).

26 The RDF is being trialled in Europe and the United States for its applicability across research systems.

27 Information from policy questionnaires.

28 The Russell Group represents 20 universities in the United Kingdom: University of Birmingham; University of Bristol; University of Cambridge; Cardiff University; University of Edinburgh; University of Glasgow; Imperial College London; King's College London; University of Leeds; University of Liverpool; London School of Economics & Political Science; University of Manchester; Newcastle University; University of Nottingham; University of Oxford; Queen's University Belfast; University of Sheffield; University of Southampton; University College London; University of Warwick.

29 Information supplied by RIHR delegate.