



Joint Career Tracking Survey of Doctorate Holders

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ESF-Science Connect

- European Science Foundation – over 40 years of funding and networking research
- 2016: ESF launches its services division Science Connect
- Promoting scientific developments by supporting decision-making for research funding and performing organisations through:
 - Peer review
 - Evaluation
 - Career Tracking
 - Programme and Project Management
 - Hosting Expert Boards and Committees

Our partners and projects



Our expertise



300,000 Researchers in our network
("Community of Experts")



Proven science management procedures



2,000 programmes managed in 30 countries



12 languages spoken by our team

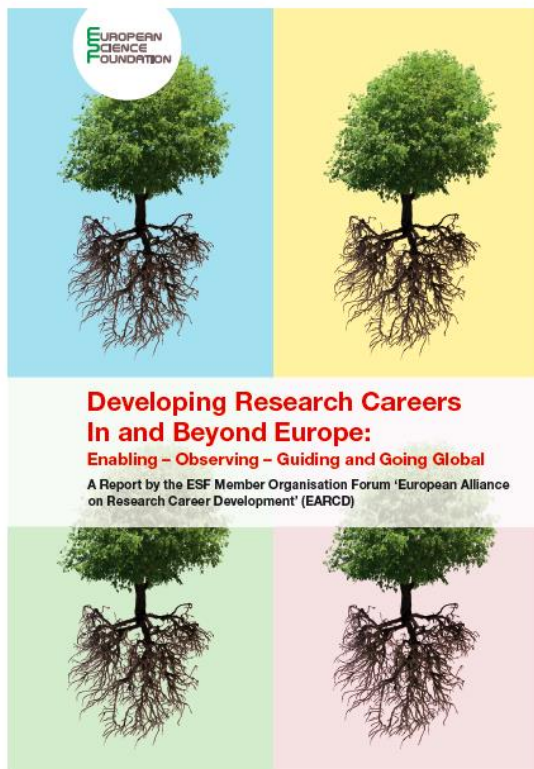
Wider context

- EU policy for “knowledge economy” claimed **700 000 additional researchers needed** (Lisbon, 2000)
- PhD bubble? Between 1998 and 2006, **number of PhD increased by 40%** in OECD countries. This trend is likely to continue with implementation of Bologna declaration.
- Academic sector has traditionally been the **largest employment sector for doctorate holders**, but will not be able to absorb an ever-increasing share of doctorate holders
- Many PhDs aim for an **academic career as first/preferred choice**
- **Academic career track is highly competitive**, resulting in a large number of postdocs on temporary contracts (ESF, Science Europe, Nature)
- Increasing numbers of those that do research outside academia and also in non-research positions
- What is **employability** of PhDs?
- Are PhDs prepared for non-academic careers? Skills mismatch in industry?

What does it mean for doctoral education?

- ***“Doctoral education must increasingly meet the needs of employment market that is wider than academia”*** (Salzburg Principles, EUA)
- Doctoral education as strategic national (and European) resource (B. Kehm, M. Nerad, EC, EUA, LERU, OECD, World Bank report...)
- Universities need to adapt their own institutional strategies to help their doctorate graduates embark on professional careers outside academia
- Trend to more individualised doctorates, problem-solving approach, multi-disciplinary teams, transferable skills training provision (managerial or teamwork skills), collaborative doctorates with industry...(EUA, EuroTech and LERU)
- Ensuring employability of PhDs is not the responsibility of universities alone. Non-academic sector must offer enough knowledge-intensive jobs AND ensure attractive working conditions for PhD holders and researchers

ESF European Alliance on Research Career Development, 2007-2013



- “Researchers’ careers are increasingly diverse!”
- “Researchers need to develop a wide range of skills”
- Need for a **structured approach to professional development for researchers** -> towards a European Researchers’ Professional Development Framework”
- “Research organisations are accountable vis-à-vis their researchers and society at large to show that their programme achieve the desired impact and that scarce resources are well spent”
- Need for career tracking and working towards a **European Research Career Tracking Platform**

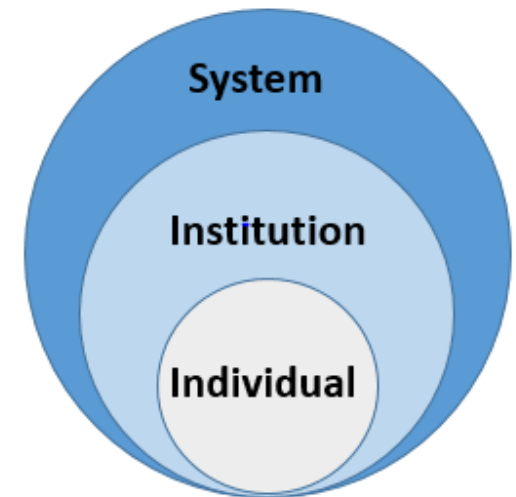
Definition of ‘Career Tracking of Researchers’

Initiatives that follow up researchers’ careers over a certain time period to understand researchers’ career pathways. Surveys that trace back careers over several years, cohort studies at several moments in time (not just one) or longitudinal surveys are considered to fit the definition.

Cf. Developing Research Careers In & Beyond Europe, p. 15

Benefits of career tracking

- Information about **employability** of PhDs in and out of academia, discipline-specific careers
- Monitor **career advancement over time**: moves in and out of academia, in and out of research
- Information on **skills utilisation** in jobs and feedback on doctoral programme
- Can be part of the **periodic assessment of doctoral and career development programmes**
- Offer **better-informed career advice** and **awareness of wider career options**, provide data on employment to prospectives and current students
- Establishing links with **alumni**



Joint Career Tracking survey 2016-2017

- **Universities**

Goethe University Frankfurt (Germany)
Maastricht University (Netherlands)
Technical University Munich (Germany)
University of Bucharest (Romania)
University of Split (Croatia)
University of Luxembourg (Luxembourg)

- **Non-university research performing organisations**

Luxembourg Institute of Science and Technology
Institute of Science and Technology Austria

- **Research Fund**

Axa Research Fund (France)



Goals

- 1) Follow-up to the **ESF pilot survey (2015)** and further develop a framework for future career tracking studies
- 2) To provide **data analysis on doctorate holders from each Partner Organisation**
- 3) To analyse **aggregated trends** across all participating organisations
- 4) Advocate a **joint initiative** and **promote career tracking studies** across Europe

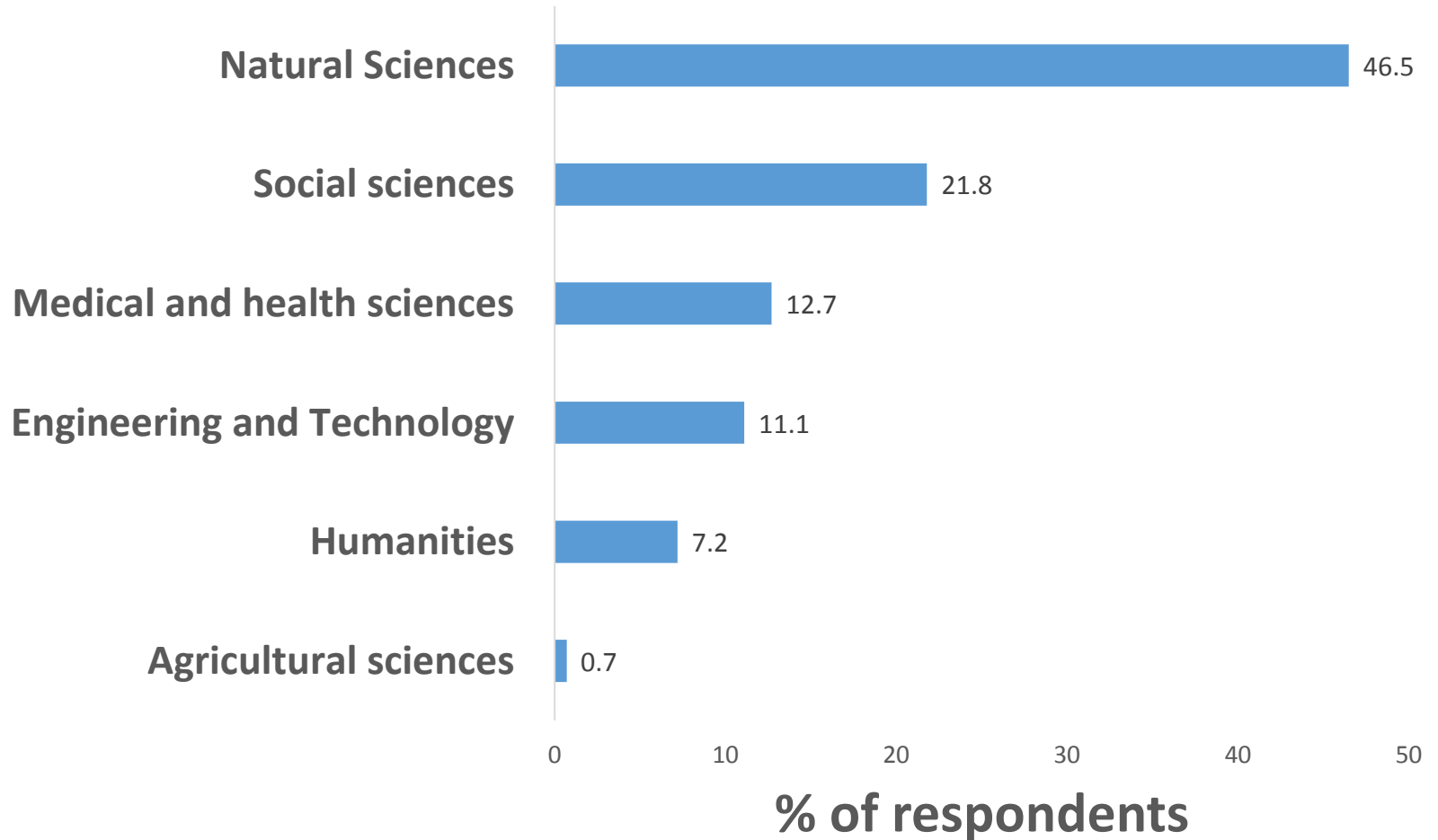
Methodology

- Cross-sectional retrospective study, PhD holders up to seven years after completion (2010-2016)
- Questionnaire explored employment situation, job search supports, transition to labour market, skills utilisation, PhD relation to job, satisfaction, collaboration, mobility and demographics
- Organisation-specific questions
- Launch of survey to 9954 doctorate holders in March 2017
- Number of complete responses: 2046
- Overall response rate: 24%

Selected preliminary findings



Field of Study

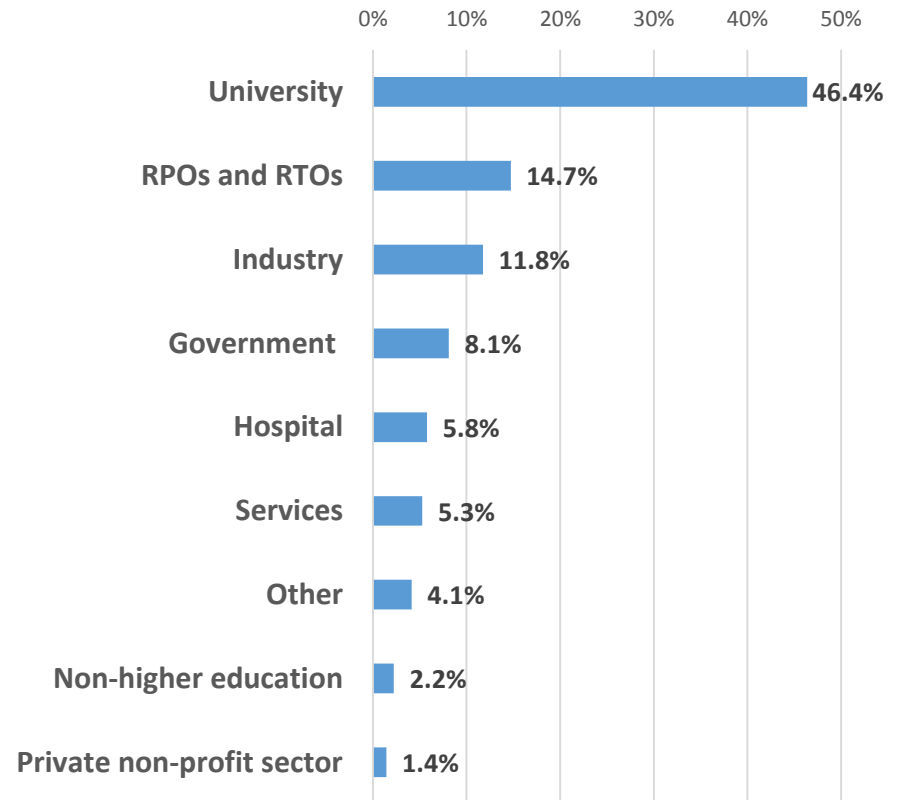


Employment situation

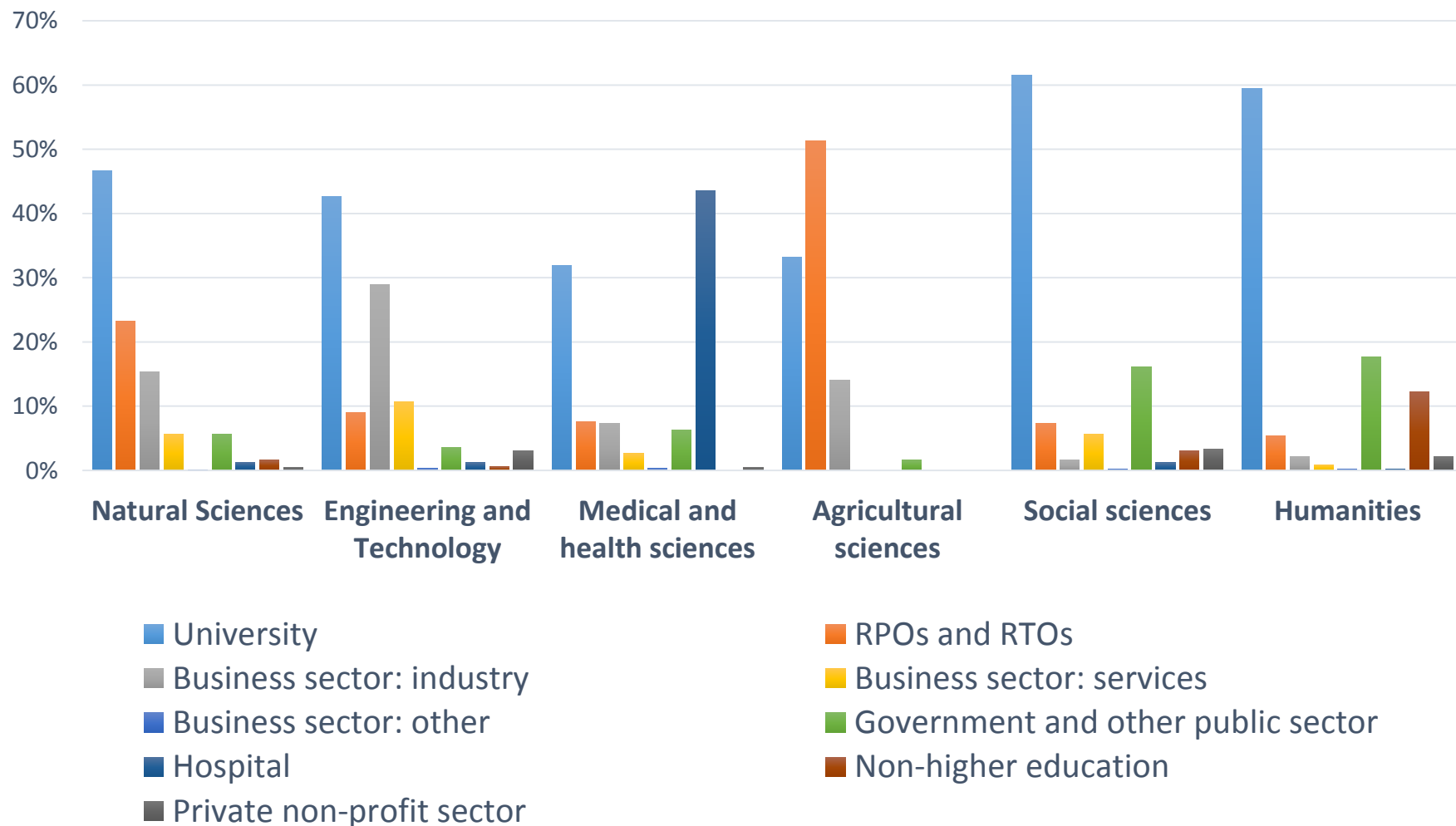
- Employment rate: **95%** (4 months until job)
 - **65%** on **permanent** and **27 %** on **temporary** contracts (76% and 20% - 6 years after PhD)
 - 87% in full-time employment, less than 6% in part-time employment
 - 25% are in post-doc positions
 - 2% self-employed
- **4 %** unemployed (2% - unemployment 6 years after PhD)
- **1%** other status (career break, study, retired)

Sector of Employment

- **Over 60% work in academic sector:**
 - 46% in University
 - 15% in RPOs and RTOs
- **Nearly 40% in non-academic sectors, incl.:**
 - 17% in Business sector
 - 8% in Government
 - 6% in Hospital



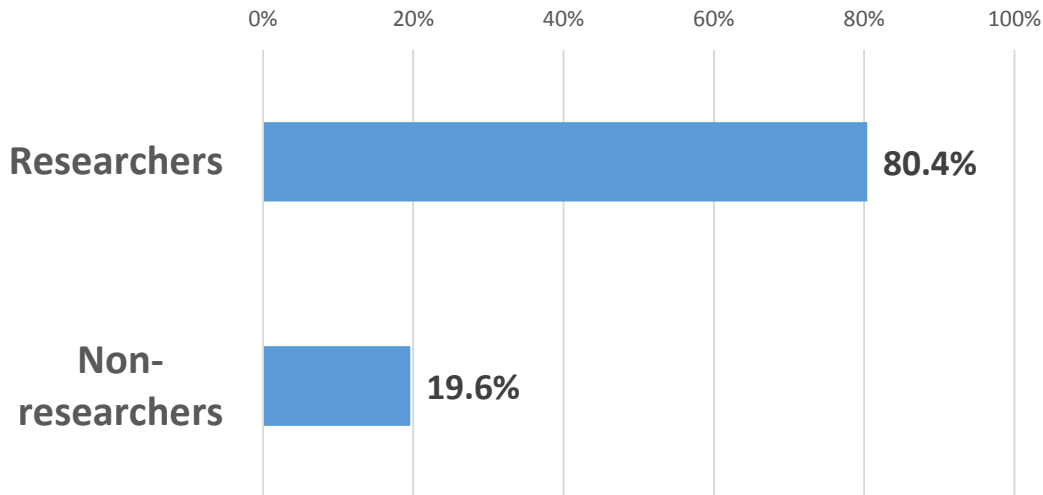
Sector of Employment by Field of study



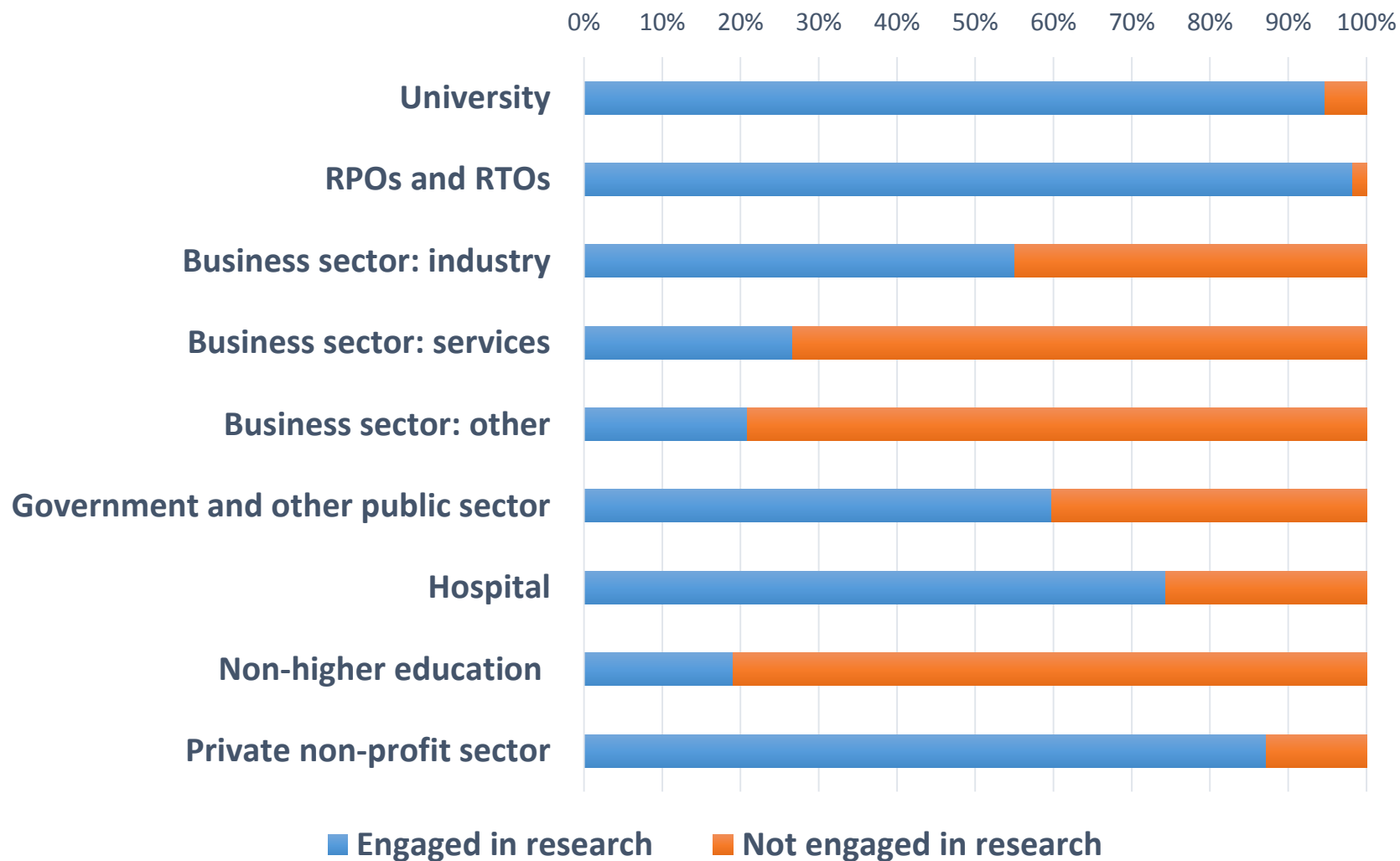
Share of researchers vs. non-researchers

A majority of PhDs are engaged in research in their job

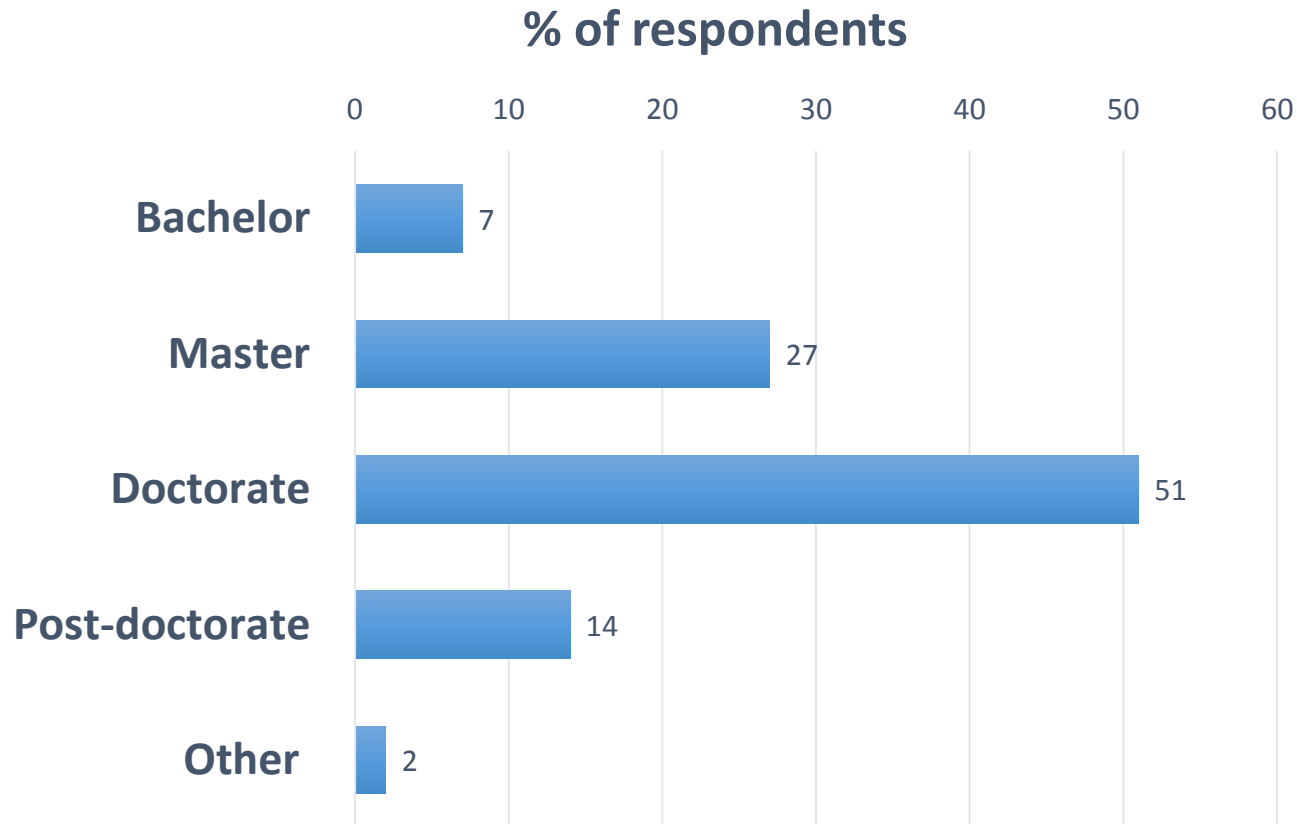
“engaged in creative work undertaken on a systematic basis in order to increase the stock of knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications” (Frascati Manual)



Engagement in research by sector of employment



Minimum education qualification for job

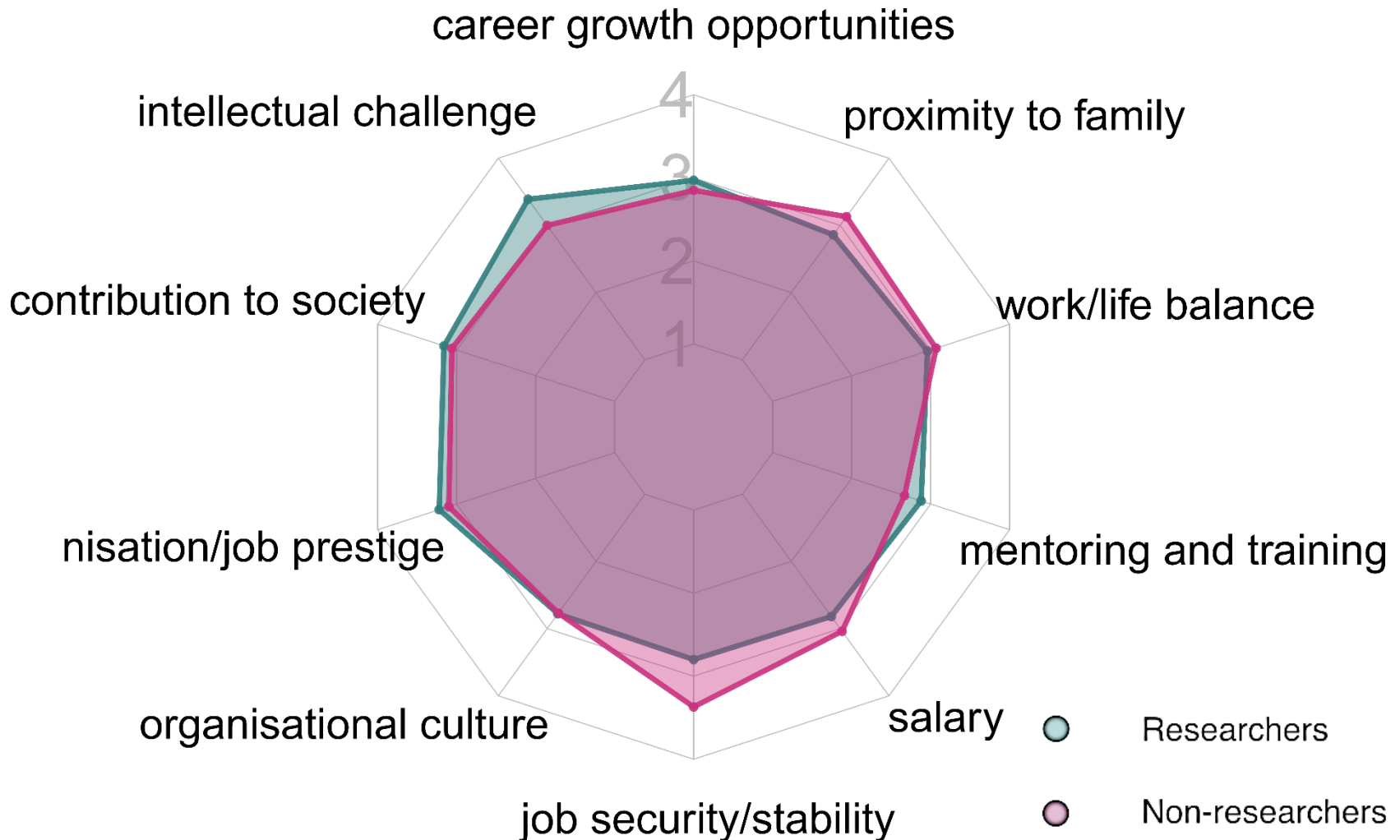


“You can never be overdressed or overeducated.”

- Oscar Wilde

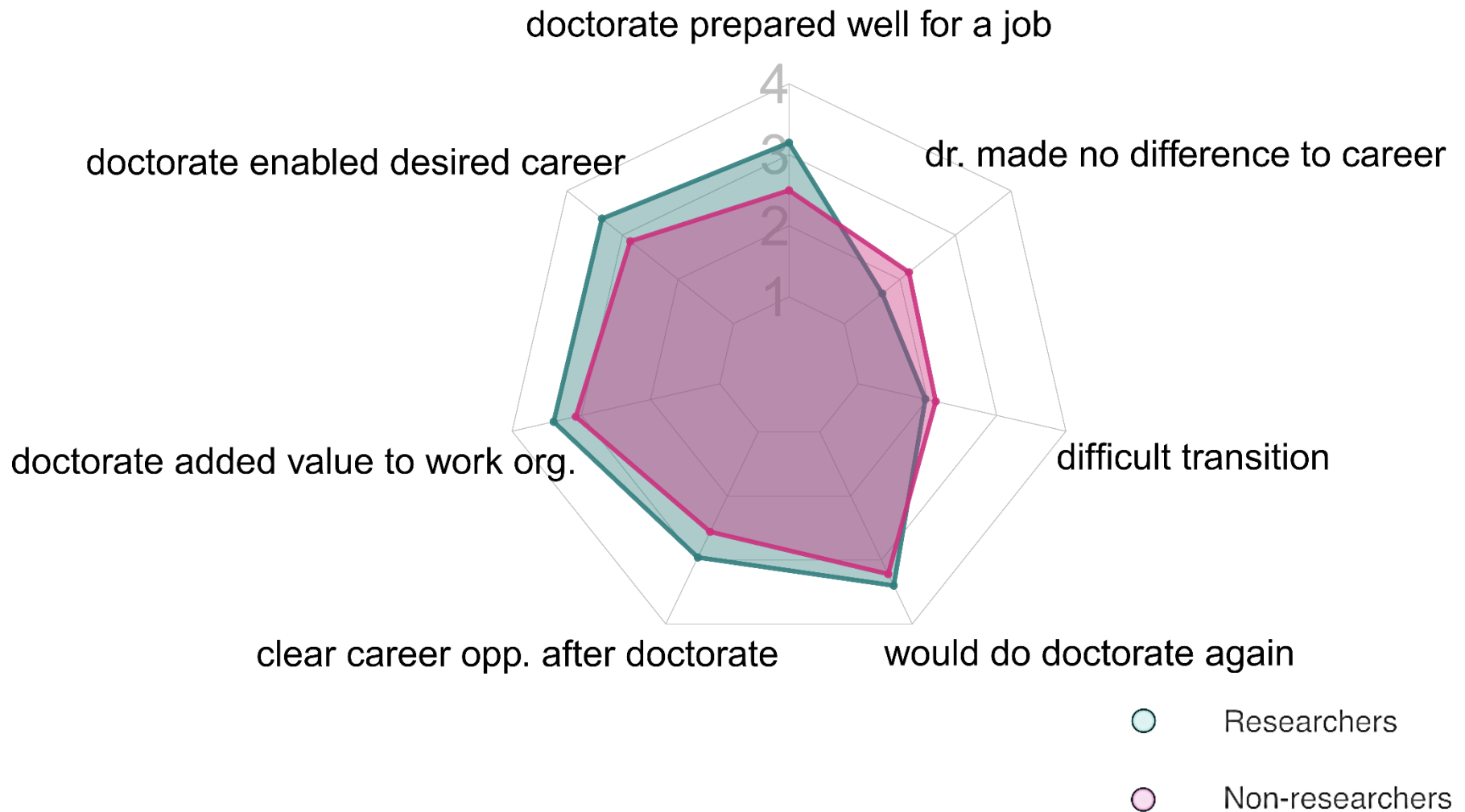
Satisfaction with current job

(1: not at all satisfied; 4: very satisfied)

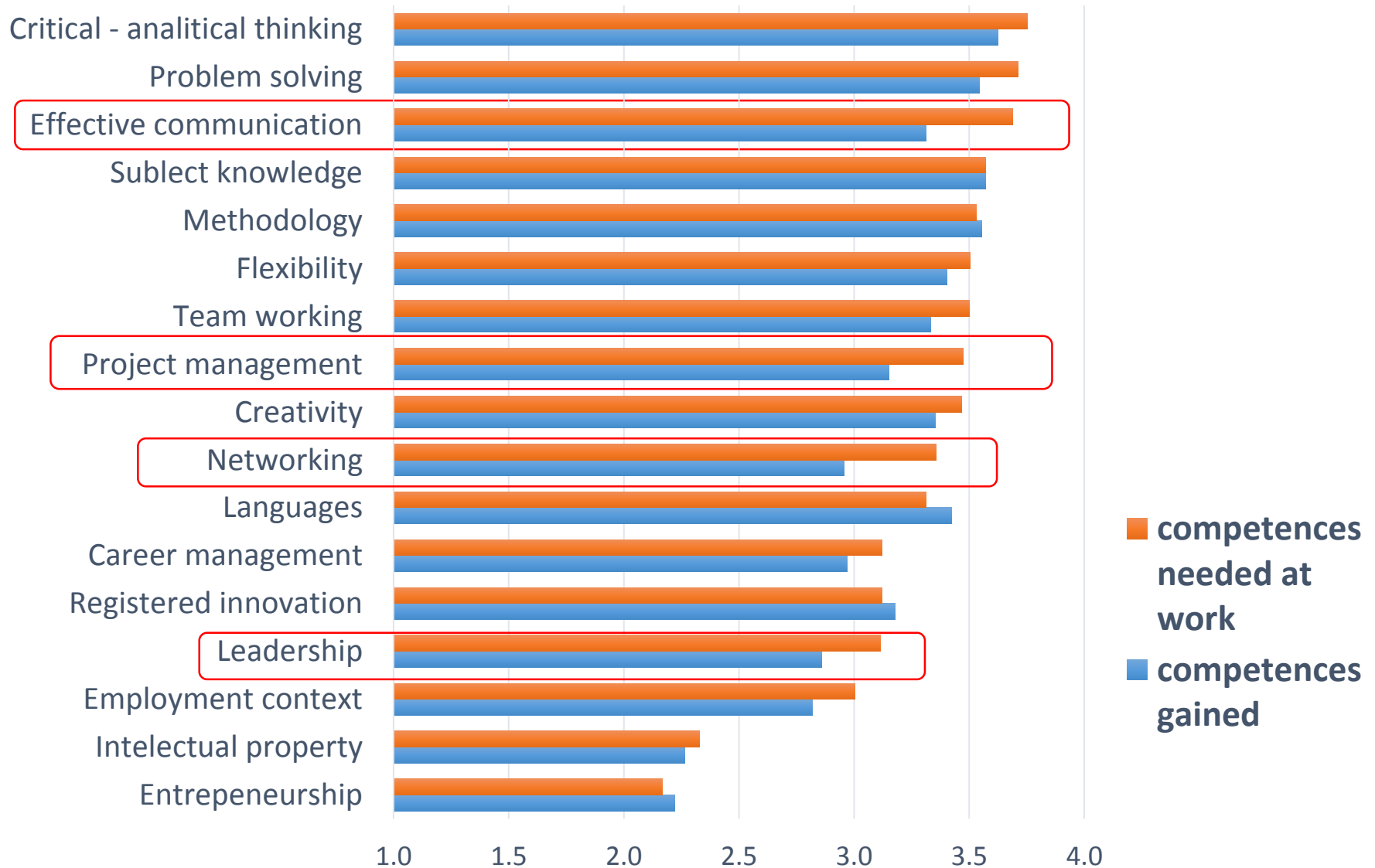


Globally positive experiences regarding added value of PhD

(1: strongly disagree, 4: strongly agree)

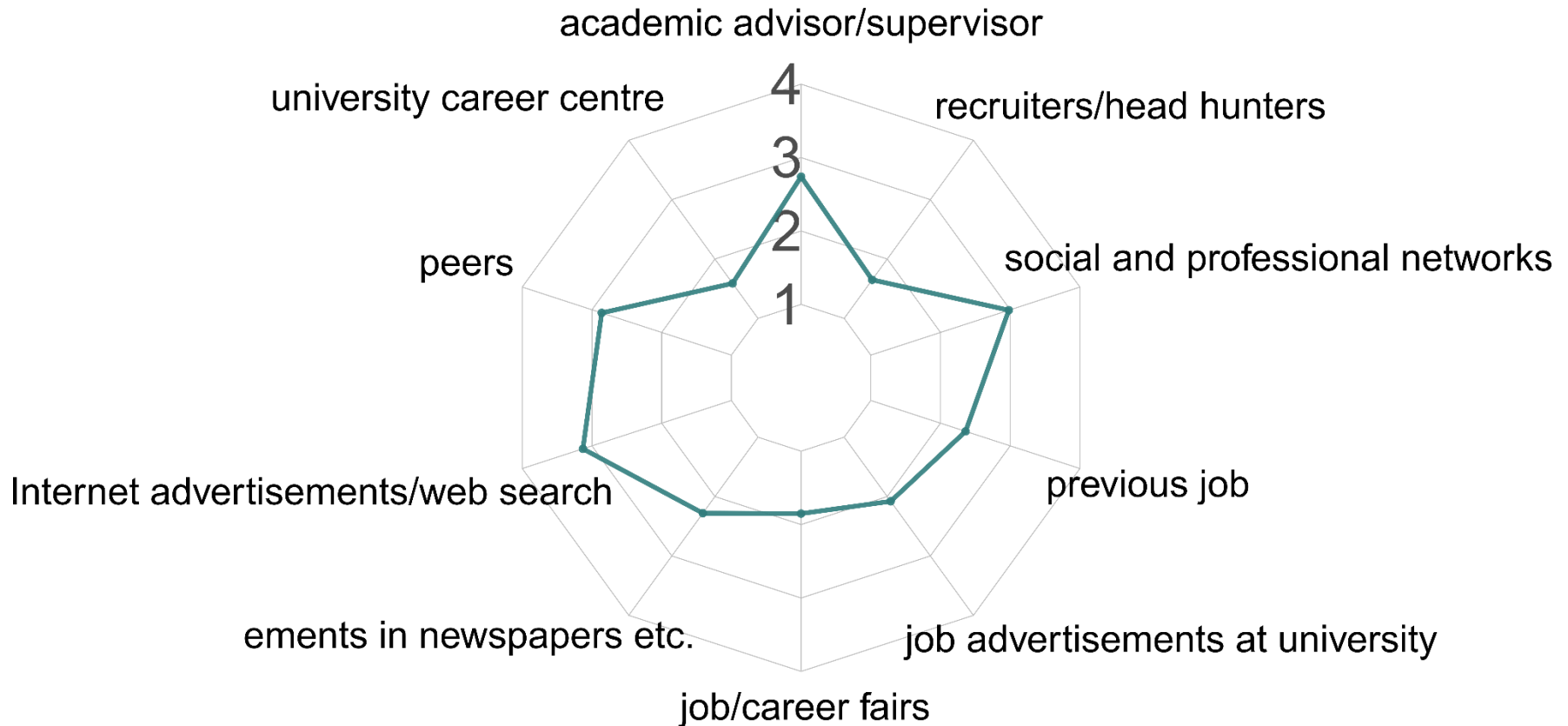


Competences needed in current job vs. competences at PhD completion



Supports for job search

(1: not at all important, 4: very important)



The Technical University of Munich (TUM)

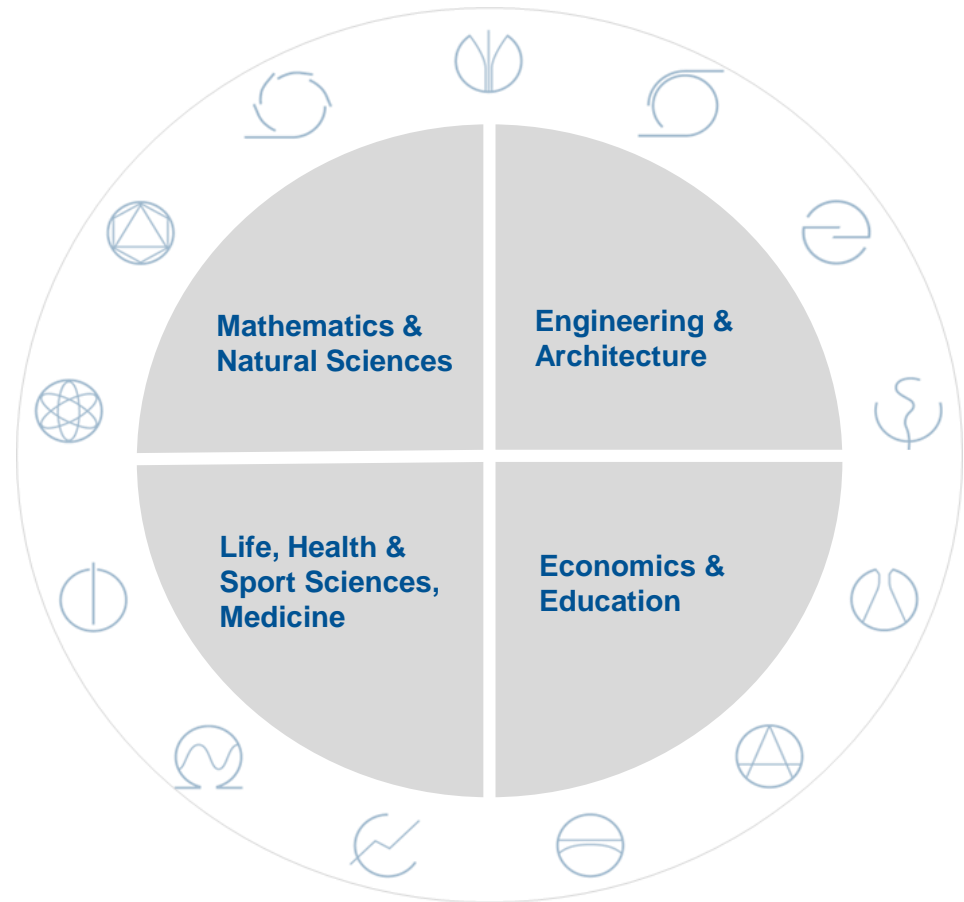
40,000 Students, 34% female, 22% internat'l
8,200 Graduates per year, 1,000 PhDs per year

528 Professors
6,200 Scientific Staff, ~5,000 of whom PhDs

165 Degree Courses
13 Departments
7 Interdisciplinary Research Centers

5,000 Publications, peer-reviewed per year
58 ERC Grants (since 2008)
13 Nobel Prize Laureates

#51 Shanghai Ranking
#11 Global Employability University
Ranking (Europe: #3)



Framework and Motivation

Starting point and current situation in Germany:

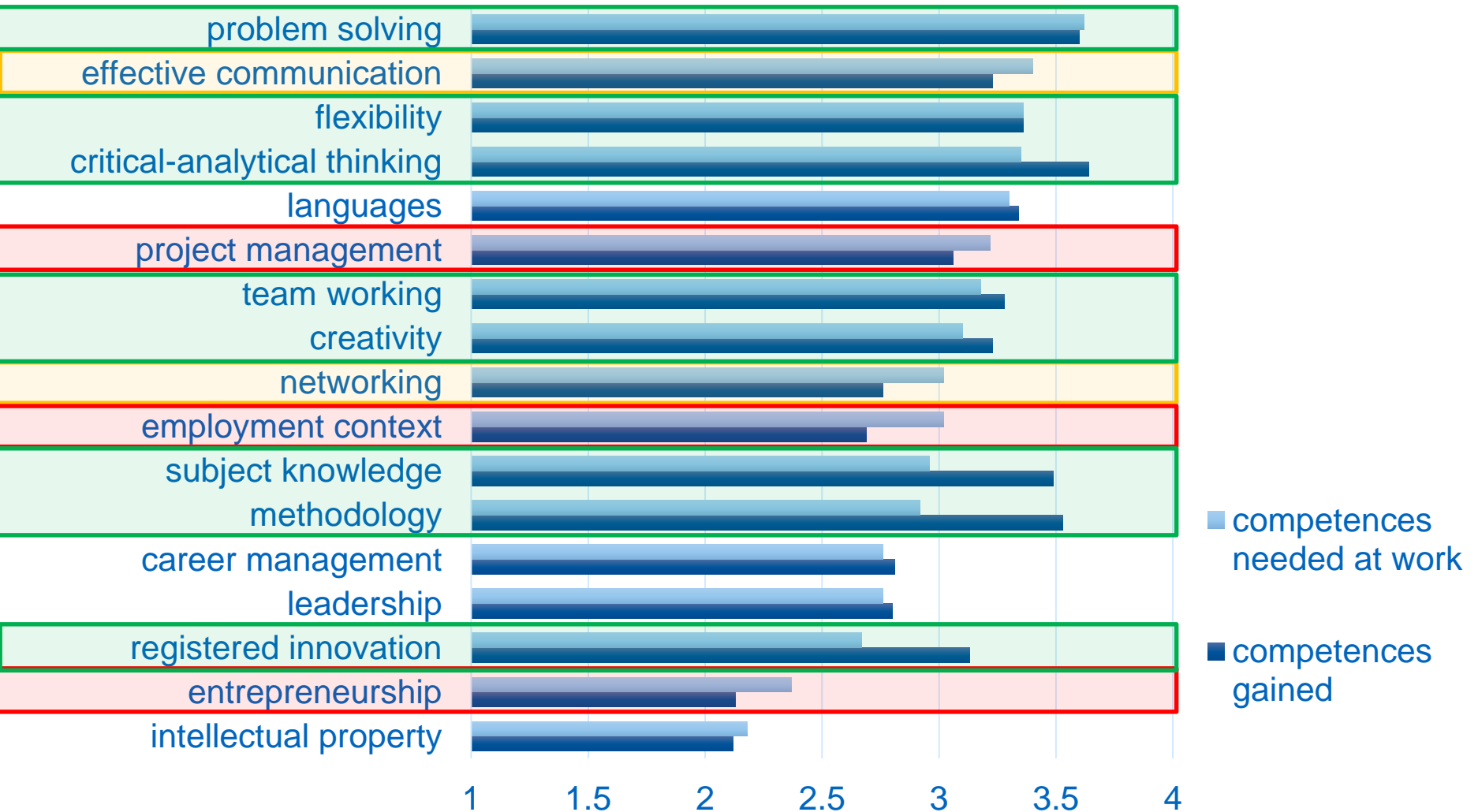
- increasing number of doctoral researchers (+55% since 1990)
- individual doctorates vs. structured training
- status & funding of doctoral researchers differ
- diverse values, standards and demands of a doctorate
- changing global job markets
- issues of good scientific practice



Goals and approach of TUM and TUM Graduate School:

- ensure high quality of training for all & for the high-fliers
- moderately structure all doctorates, provide competence training & services
- promote best practice, increase visibility of candidates
- set university-wide standards, call for subject-specific initiatives
- career orientation, international, interdisc. & intersectoral collab.
- sensitize & train doctoral researchers & supervisors

Competences Gained and Needed



Reception of Services by TUM Graduate School

- Only **36%** of respondents have used services of TUM Graduate School:
 - Internationalization support ‘very/fairly useful’ (**69%**), same for competence training (**65%**); career coaching only **34%**
 - **88%** have taken part in competences training, **67%** went abroad; only **35%** used proofreading, **40%** welcome services, **50%** career coaching
- Some respondents wish there had been a graduate school in their times...
- ...others refuse any mandatory coursework ‘limiting the freedom of research’

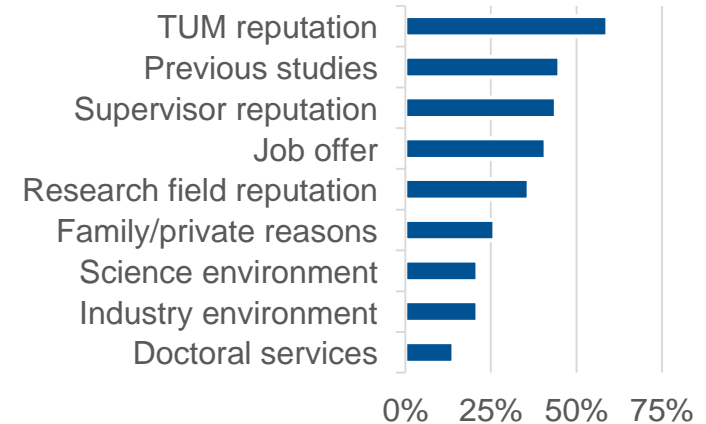
Most valued Services of TUM-GS (N=335)



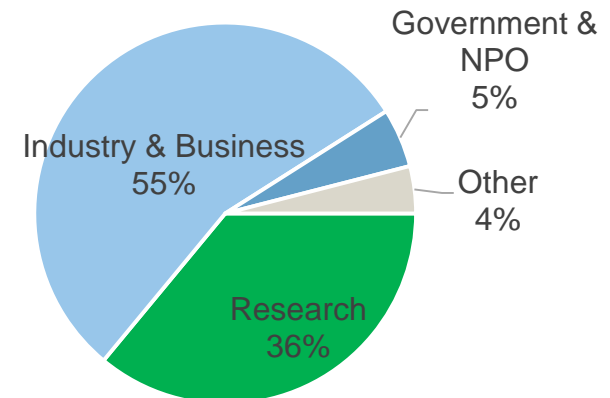
First Overall Learnings from the Survey

- In retrospective, most alumni (2010-2016) seem to be happy and grateful for their PhD at TUM, mainly due to
 - open-mindedness of professors & teams
 - opportunities for independent research & teaching
- Only **2%** (of 992 respondents) are unemployed
 - 92% employed (4 months until first job)
 - 4% self-employed
 - 2% on career break, full-time study, or retired
- **74%*** think doctorate prepared them well for first job (59% non-researchers, 85% researchers)
- **81%** said doctorate permitted desired career path (71% non-researchers, 90% researchers)
- **85%** would do doctorate again (even 79% of the currently unemployed)

Reasons for TUM (N=919)



Current employment (N=909)



Issues to Think About and Next Steps

- **Survey** resulted in many opportunities to reflect and discuss questions & findings
- **Further analysis** of survey outcome, e.g. subject-specific issues, ‘typical doctoral candidates’, careers of researchers and non-researchers, development over time; discuss with other participants of the survey
- **Evaluation of TUM doctoral system:** Implement results in self-evaluation report, together with course evaluations, planned PhD survey, supervisor & other stakeholder interviews
- **Benchmarking** with partner universities, possibly enter into joint periodic assessments
- **Improvement** of TUM Graduate School services and rules, e.g. career consulting, examination procedures, issues of good scientific practice (open science, authorship, ...)

Lessons learned and future plans

- Regroup similar initiatives where possible for economies of scale and learning exchange benefits among participating organisations
- PhD contact availability and data protection regulations may impact feasibility and choice of methodology
- Using qualitative methods (focus groups, interviews with PhDs and university staff) in addition to surveys is useful to put the findings in a specific institutional or national context
- Future studies: joint studies, participative benchmarking studies with groups of similar institutions, discipline specific studies
- Working towards a (virtual) European platform for career tracking

Thank you!

For more information, please contact

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www.scienceconnect.eu