DocEnhance

Transferable skills trainings and PhD employability beyond academia

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Why DocEnhance?

Partners of DocEnhance project during the kick-off meeting in Tromsø *Foto: Jonatan Ottesen/UiT*

- PhD holders more likely to follow a career outside the university as numbers of PhDs on the rise (OECD, Education at a Glance, 2019; Kehm, 2007)

- Reported mismatches between employers' needs and skills developed in doctoral programmes (DeGrande et al, 2014; Bebiroglu et al, 2022)

- *"Offering training in transferable skills ... is central, and should be a priority for doctoral schools and programmes"* (Salzbourg II recommendations, EUA, 2010)

- *"Identifying missing elements of skills training remains an important task..."* (Survey "Doctoral Education in Europe today", EUA-CDE, 2022)

DocEnhance aims

1. Collecting **evidence on PhDs' employment and skills usage**

2. Developing **employment and innovation-oriented PhD curricula** for PhD programmes

3. Involving **non-academic sector in the development of transferable skills trainings**

Transferable skills

What are these?

- *"...skills learned in one context (for example research) that are useful in another (for example future employment whether that is in research, business etc). They enable subject- and research-related skills to be applied and developed effectively."* (European Science Foundation, 2009)

- Learned through **skills training and learning-by-doing**, e.g. doctoral research, thesis writing, teaching, internships outside academia, join collaborative projects or joint programmes

- Skills such as **teamwork**, **project management** or **entrepreneurship** also important for innovation and knowledge transfer (EC, 2010; OECD, 2012)

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Assessing skills needs

What are important skills for the non-academic sector?

1) DocEnhance **regional stakeholder workshops** with industry, technology, non-profit and data-driven sectors identified:

- **adaptability, communication, collaboration, language skills, followed by problem solving and management skills** (DocEnhance policy brief, 2021)

2) DocEnhance **survey of PhD holders** from partner universities

3) A short **survey of non-academic employers** of PhD holders (focus on skills)

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DocEnhance survey

▌ **Target population**

- PhD graduates between 2016 and 2020 from 9 participating universities (NL, DE, NO, GR, ES, PT, SK, IT, CZ)

▌ **Goals of the survey**

- Employment situation, satisfaction with doctoral training, skills acquired and used, added value of PhD, etc.
- A pilot for 7 of the 9 universities (training curricula adjustment, information to prospective PhD candidates)
- Questionnaire based on ESF career-tracking surveys 2017, 2015 + developed with DocEnhance partners

▌ **Survey**

- 2,217 responses collected (response rate: 23 %)

Profile of PhD holders

▌ **Gender: 48% male, 51% female, 2% other**

▌ **Age: 68% aged 30-39**

▌ **Field of study (%)**

- Natural sciences 27%
- Engineering and technology 16%
- Medical and health sciences 19 %
- Agricultural sciences 3%
- Social Sciences 23%
- Humanities 12%

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Main results

DocEnhance survey of PhD holders

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Doctorate holders' employment

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91%
have a professional activity

<3 months
to find a job after graduation

20%
are employed on temporary contracts

+50%
are employed outside academia

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Sector of employment

37% in universities	**22%** in private sector
12% in research organisations	**10%** in health care
8% in the government	**11%** in other sectors

All findings from DocEnhance Career-tracking survey at www.docenhance.eu
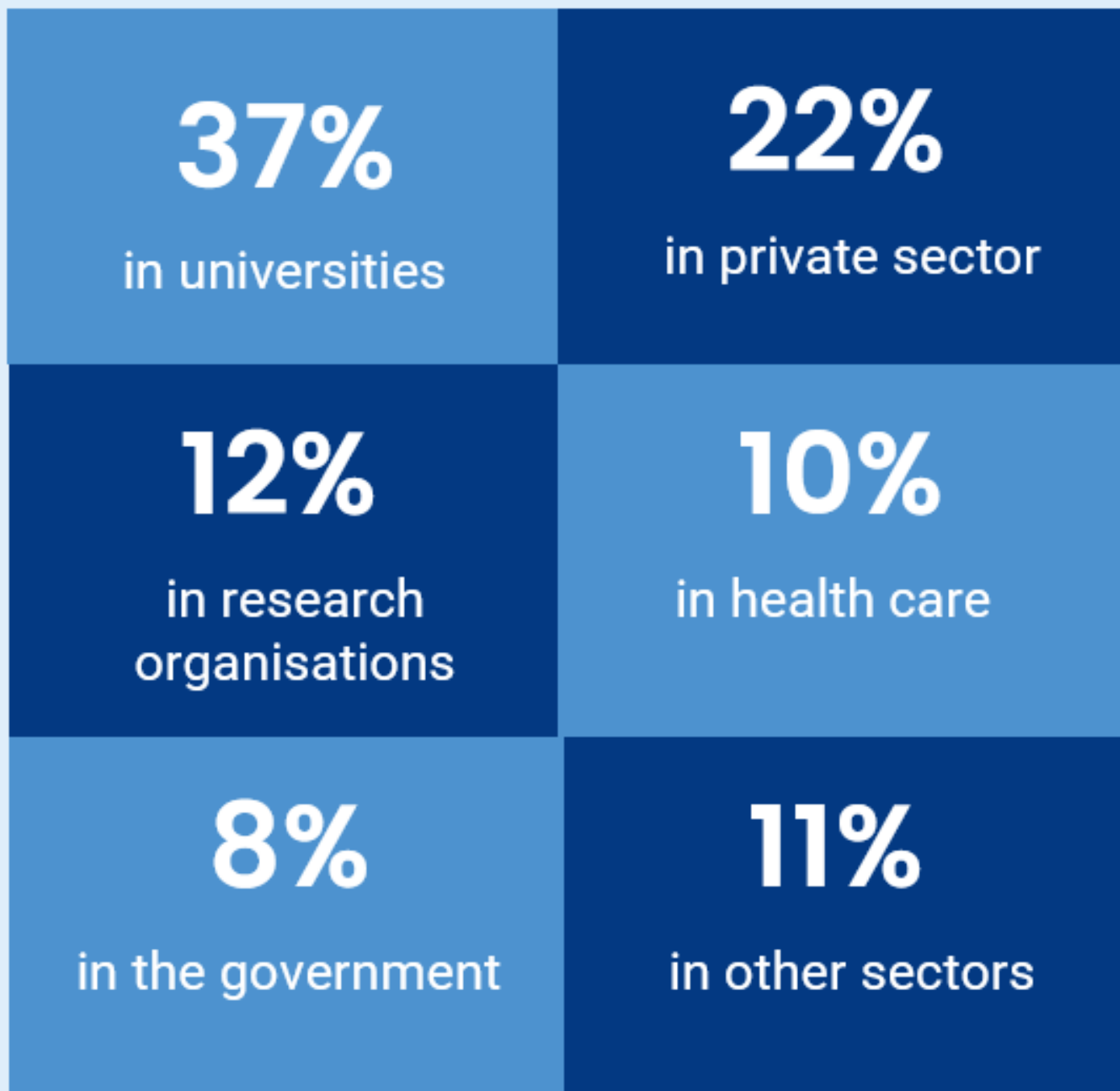
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How many PhD holders are engaged in research in their current job?

31%

69%
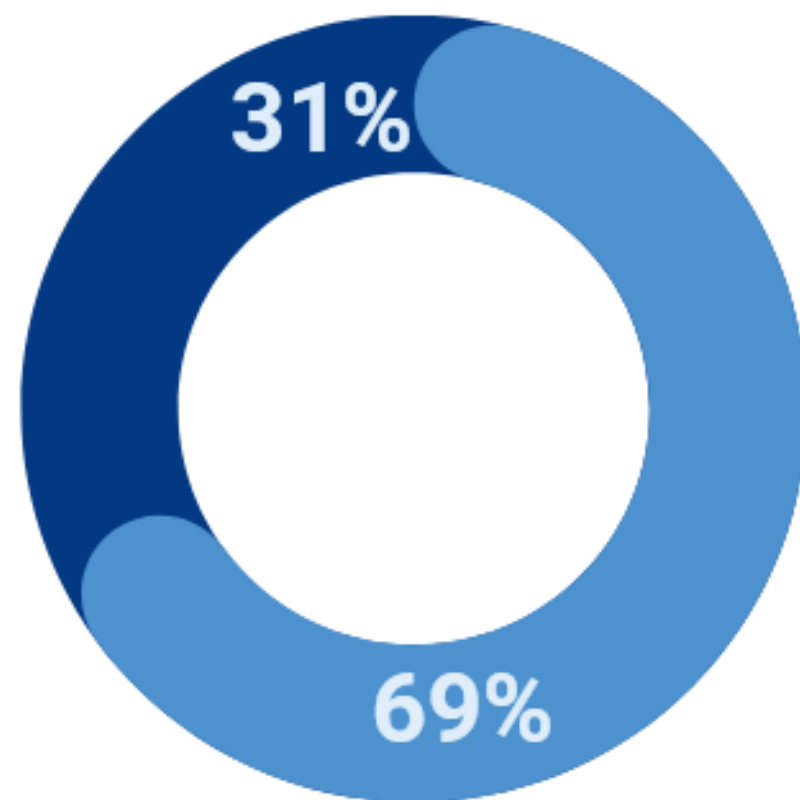
Work in research

Do not work in research

All findings from DocEnhance Career-tracking survey at www.docenhance.eu

Are PhD holders working in jobs that require a PhD?

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All findings from DocEnhance Career-tracking survey at www.docenhance.eu

54%

46%
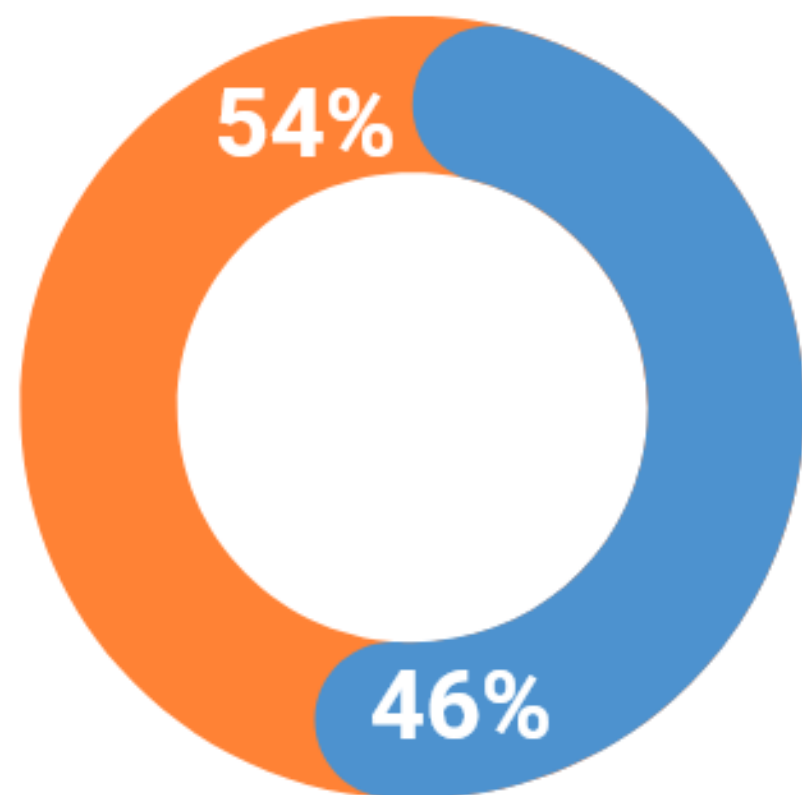
Work in jobs that do not require a PhD

Work in jobs that do require a PhD

Satisfaction with doctoral training

(1 = very dissatisfied, 5 = very satisfied)

Category	Score
Quality of research training	4.0
Quality of transferable skills training	3.9
Services for doctoral candidates at your university	3.6
Supervision provided by the supervisor(s)	4.0
Support to pursue an academic career	3.4
Support to pursue a non-academic career	3.0

0   5

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60% took transferable skills training
24% "no trainings available"

No, no trainings were available 24%

Yes, trainings were mandatory 29%

No, trainings were optional 16%

Yes, trainings were optional 31%

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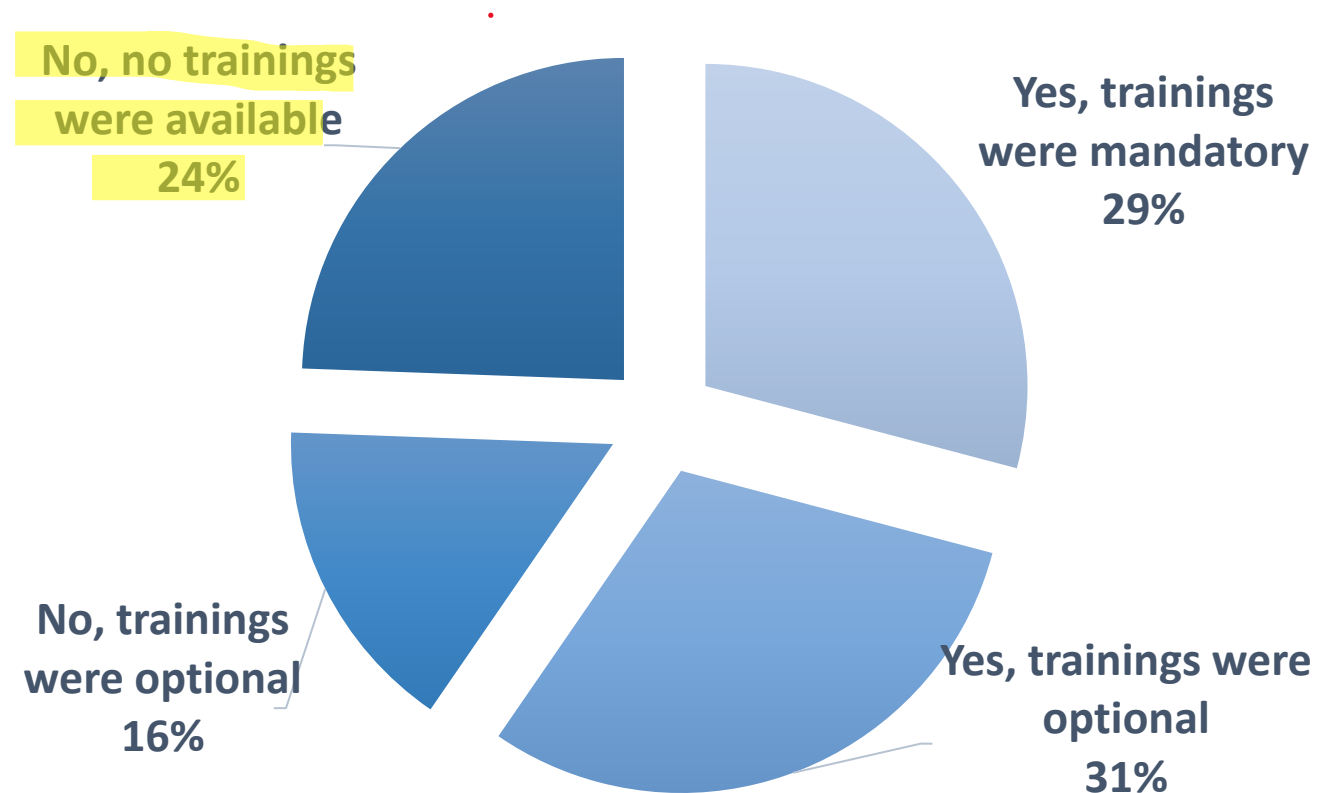
PhD in collaboration with another organisation?
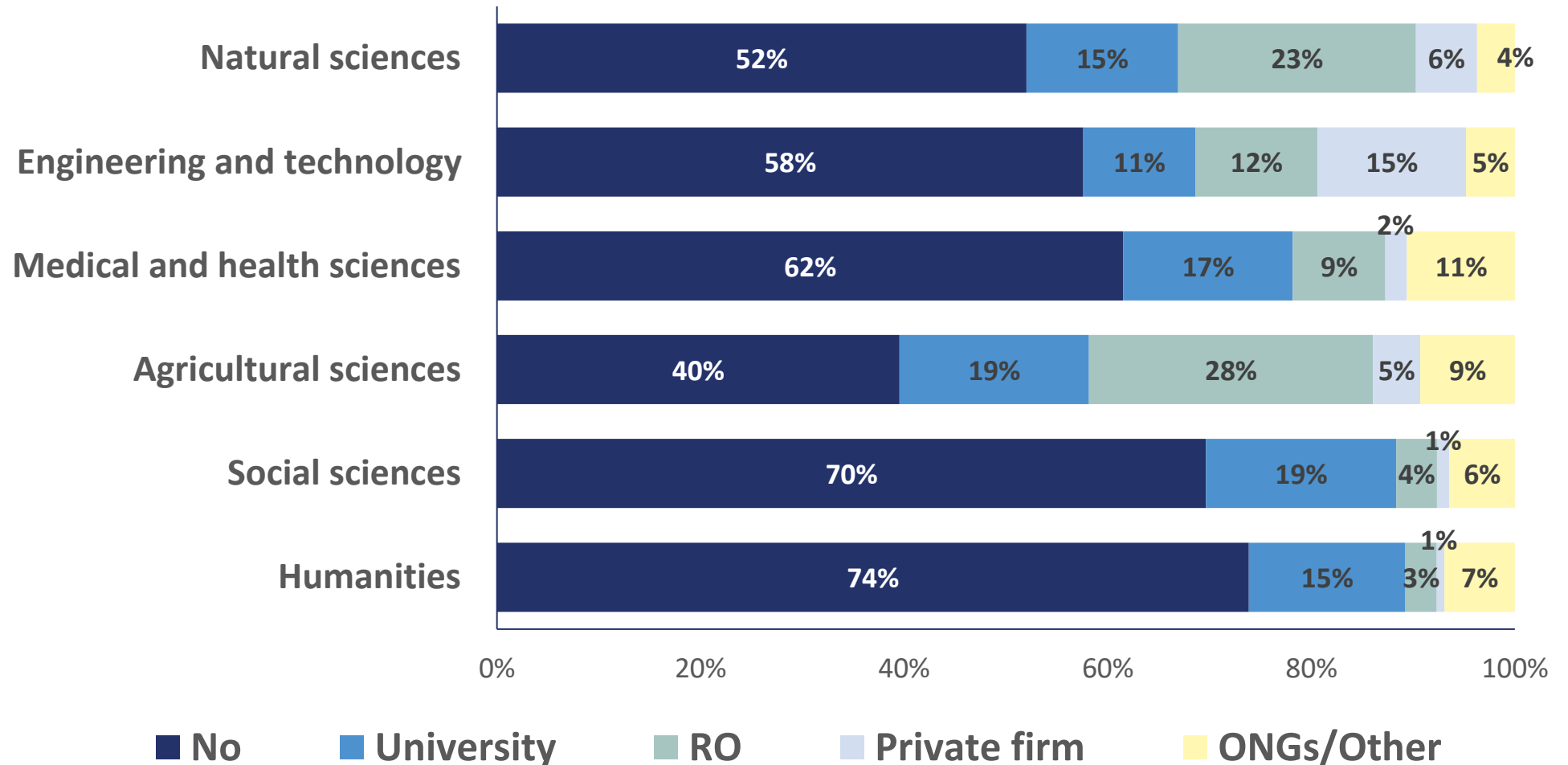
	No	University	RO	Private firm	ONGs/Other
Natural sciences	52%	15%	23%	6%	4%
Engineering and technology	58%	11%	12%	15%	5%
Medical and health sciences	62%	17%	9%	2%	11%
Agricultural sciences	40%	19%	28%	5%	9%
Social sciences	70%	19%	4%	1%	6%
Humanities	74%	15%	3%	1%	7%

0%   20%   40%   60%   80%   100%

■ No   ■ University   ■ RO   ■ Private firm   ■ ONGs/Other

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Skills for survey

➢ Created a list of 24 skills clustered in 5 groups (Auriol et al., 2013; ESF, 2012,2017):

- **Research skills and other academic/technical competences** (Subject knowledge, Methodology, Research valorisation, Teaching…)
- **Personal skills** (Critical-analytical thinking, Problem-solving, Creativity, Flexibility, Personal effectiveness…)
- **Professional skills** (Team working, Entrepreneurship, Networking, Negotiation…)
- **Communication skills** (Effective communication, Languages, Intercultural skills, Digital communication)
- **Management skills** (Project management, Career management, Data stewardship)

➢ Asked PhDs about their skills at PhD completion and skills needed in their jobs

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Skills at PhD completion and in current job

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Subject knowledge
Data Stewardship
Career Management
Methodology
Intelectual Property
Research Val., Engag....
Research Ethics and...
Teaching/Mentoring/Su...
Critical-Analytical...
Problem solving
Creativity
Flexibility
Personal effectiveness
Resilience
Team Working
Entrepreneurship
Networking
Negotiation
Self-branding
Effective Communication
Languages
Intercultural Skills
Digital Communication
Project Management

4.5
4
3.5
3
2.5

—At doctorate completion   —At current job

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University

Subject knowledge
Methodology
Intelectual Property
Research Val., Engag.…
Research Ethics and…
Teaching/Mentoring/Su…
Critical-Analytical Thinking
Problem solving
Creativity
Flexibility
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Resilience
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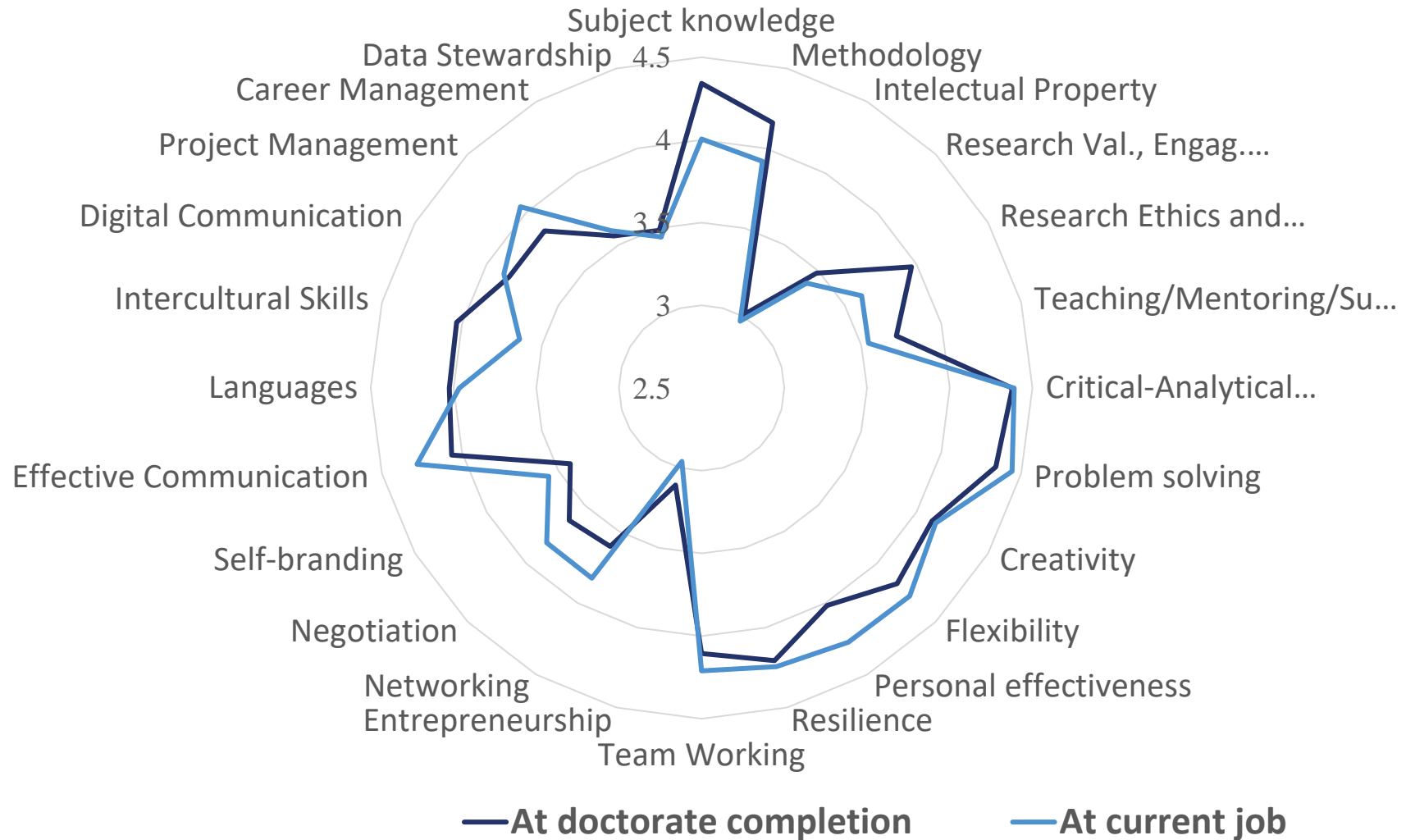Project Management
Career Management
Data Stewardship

5
4.5
4
3.5
3
2.5

—— At doctorate completion   —— At current job

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Private sector

Radar chart with axes (clockwise from top): Subject knowledge, Methodology, Intelectual Property, Research Val., Engag.…, Research Ethics and…, Teaching/Mentoring/Sup…, Critical-Analytical Thinking, Problem solving, Creativity, Flexibility, Personal effectiveness, Resilience, Team Working, Entrepreneurship, Networking, Negotiation, Self-branding, Effective Communication, Languages, Intercultural Skills, Digital Communication, Project Management, Career Management, Data Stewardship. Radial scale: 2.5, 3, 3.5, 4, 4.5, 5.

—At doctorate completion   —At current job

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Government

Subject knowledge
Data Stewardship
Career Management
Project Management
Digital Communication
Intercultural Skills
Languages
Effective Communication
Self-branding
Negotiation
Networking
Entrepreneurship
Team Working
Resilience
Personal effectiveness
Flexibility
Creativity
Problem solving
Critical-Analytical Thinking
Teaching/Mentoring/Sup...
Research Ethics and...
Research Val., Engag. and...
Intelectual Property
Methodology

5
4.5
4
3.5
3
2.5

—— At doctorate completion   —— At current job

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Non-higher education

At doctorate completion — **At current job**

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According to PhDs…

- **Good <u>overall</u> match between skills at PhD completion and those needed at job**

- **Critical-analytical thinking and problem-solving + other personal competences are most important acquired and needed for PhDs**

- **Importance of team working, communication, and project management for work**

- **Closest skills match in academia, different gaps in different sectors** (significant differences by sector based on ANOVA tests)
    - private sector: project management, negotiation, communication and flexibility
    - non-HE: teaching
    - non-governmental and healthcare: networking
    - government : most skills at completion are scored higher than skills needed at work

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According to employers...

▌ **65 non-academic employers** from industry (43%), business sector (29%), government (8%), healthcare (5%), not-for-profit (9%) and other (6%)

▌ Important skills – **problem-solving, critical-analytical thinking, creativity** as well as **team working** and **effective communication** (scored **above 4** out of 5), also **project management**, **personal effectiveness**, **flexibility** and **subject knowledge**

▌ Compared with PhDs' self-reported skills, **skill gaps**:

- In **business sector**: Intellectual Property, research valorisation and entrepreneurship skills, also project management and networking

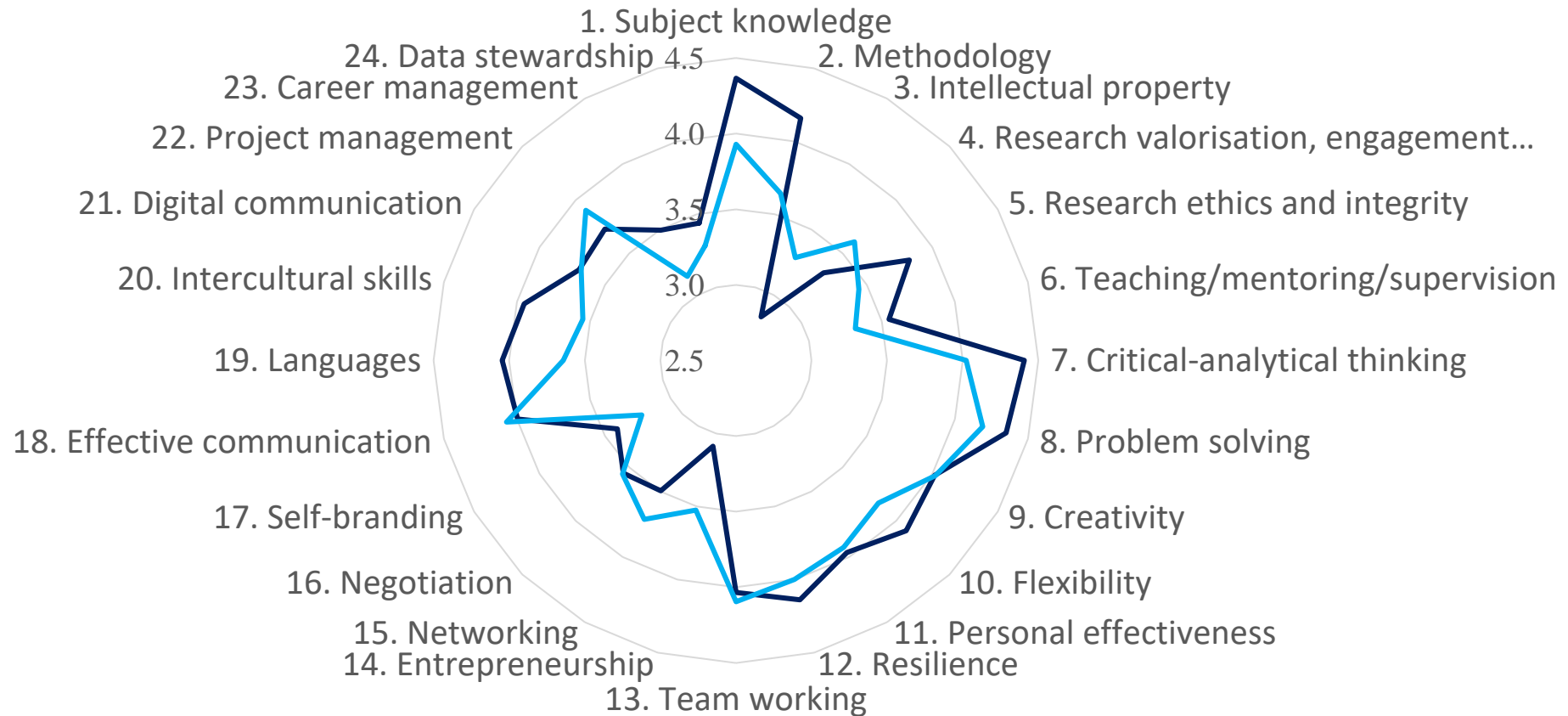- In **other non-academic sectors**: more skill gaps, e.g., team working, networking and project management

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Employers and PhDs: private sector

Radar chart axes (clockwise from top):
1. Subject knowledge
2. Methodology
3. Intellectual property
4. Research valorisation, engagement...
5. Research ethics and integrity
6. Teaching/mentoring/supervision
7. Critical-analytical thinking
8. Problem solving
9. Creativity
10. Flexibility
11. Personal effectiveness
12. Resilience
13. Team working
14. Entrepreneurship
15. Networking
16. Negotiation
17. Self-branding
18. Effective communication
19. Languages
20. Intercultural skills
21. Digital communication
22. Project management
23. Career management
24. Data stewardship

Scale: 2.5, 3.0, 3.5, 4.0, 4.5

—— **PhD holders: skills acquired at PhD completion**   —— **Employers: skills needed at job**

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Employers and PhDs: other sectors
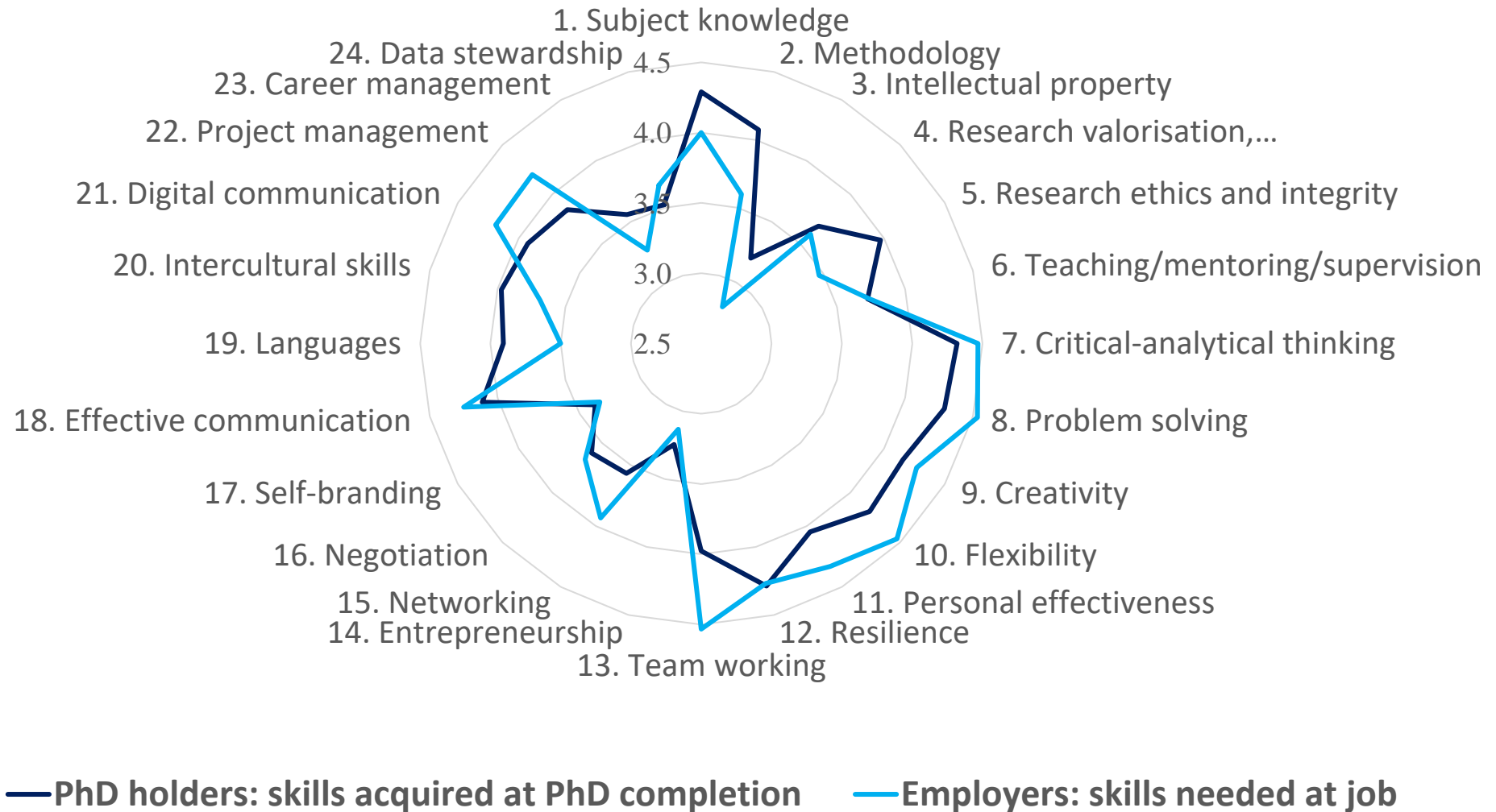
1. Subject knowledge
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11. Personal effectiveness
12. Resilience
13. Team working
14. Entrepreneurship
15. Networking
16. Negotiation
17. Self-branding
18. Effective communication
19. Languages
20. Intercultural skills
21. Digital communication
22. Project management
23. Career management
24. Data stewardship

4.5
4.0
3.5
3.0
2.5

—— PhD holders: skills acquired at PhD completion   —— Employers: skills needed at job

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Other skills PhDs lack most (open question)

▌ "understanding about how businesses operate"

▌ "adaptation to reality outside academy" and "ability to work on topics outside their speciality"

▌ "ability to connect theory and practice"

▌ "team/budget management"

▌ "public relations"

▌ "ability to get to the point instead of long research"

▌ "practical side of things"

Recommendations

▮ Offering training for a broader set of skills - esp. team working, project management, communication (also Bebiroglu et al., 2022)

▮ For the business sector – entrepreneurship, IP and research valorisation are also important to develop

▮ Learning-by-doing: collaborations during PhD, internships, project-based learning to be encouraged - choice of organisation can impact subsequent career path (also Mortier et al., 2022)

▮ Offer evidence on career pathways to PhD candidates

▮ Engage with non-academic partner networks to understand what skills are needed locally by employers

▮ Offer career guidance and support for PhDs, and for non-academic careers in particular

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DocEnhance resources

https://docenhance.eu

1. Report on the DocEnhance Career-tracking survey of PhDs

2. Good practice guide for setting-up career-tracking surveys (forthcoming)

3. Good practice recommendations for integration of transferable skills training in PhD programmes

4. DocEnhance courses available through the online platform (forthcoming)

   - Course in **Data stewardship**
   - Course in **Career management and entrepreneurship**
   - Course in **Supervision**

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