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Project acronym:

DocEnhance

Project title:

"Enhancing skills intelligence and integration into existing PhD programmes by providing transferable skills training through an open online platform"

DocEnhance online stakeholder consultation

Results from the survey of non-academic employers of PhD holders

European Science Foundation

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Introduction

This report presents the results of the online stakeholder questionnaire conducted by the European Science Foundation within the DocEnhance project¹ in November 2021. As part of the project, online and face to face regional workshops with non-academic stakeholders were organised by four of the participating universities from the project consortium to explore the needs of PhD employers and their views on the skills and value-added of the doctorate degree². The online questionnaire aims to complement this work, by reaching out to more potential PhD employers outside academia to better discern any gaps in the transferable skills needed for PhDs in the non-academic labour market. Additionally, during the first year of the DocEnhance project, a career-tracking survey was carried out with 2000+ recent PhD graduates from nine participating European universities from the project consortium and beyond (Maastricht University, Technical University of Munich, Arctic University of Norway, Aristotle University of Thessaloniki, NOVA University Lisbon, Matej Bel University, University of Alcalá, University of Sassari and University of Chemistry and Technology in Prague)³. The stakeholder questionnaire complements the views of PhD holders with the views of non-academic employers. The attention is particularly paid to a comparison between the skills acquired by doctorate holders at the completion of their doctorate and the importance given to these skills by non-academic employers.

Methodology

The target population of the online stakeholder questionnaire were employers from the non-academic sector interested to take part in this survey. In all, 101 employers responded from Austria, Belgium, Finland, France, Germany, Greece, Lithuania, Netherlands, Norway, Poland Portugal, Spain, United Kingdom, and the United States of America. Out of them, 2 respondents did not include the consent for the survey, 17 respondents declared to work for a university or research organisation (outside the target population), and additional 17 respondents did not provide information about the sector of the organisation. Analyses are then based on **65 valid answers**.

The sectors of activity were quite varied: business sector industry (43%), business sector services (29%), government or another public sector (8%), healthcare (5%), private not-for-profit sector (9%), including international organisations such as the Council of Europe or other

¹ For more information about the DocEnhance project, see: <https://docenhance.eu>

² Findings were published in *Internal Deliverable 1.3 Minutes from stakeholder workshops* DocEnhance EU-funded project.

³ Boman, J., Beeson, H., Sanchez Barrioluengo, M., and Rusitoru, M. (2021). What comes after a PhD? Findings from the DocEnhance survey of doctorate holders on their employment situation, skills match, and the value of the doctorate. Strasbourg: European Science Foundation (ESF). Available at: https://docenhance.eu/wordpress/wp-content/uploads/2021/12/DocEnhance-D1.2_Report-on-career-tracking-of-PhD-graduates.pdf



sector (6%). 75% of the organisations are involved in R&D (either continuously or occasionally). In the sample, organisations of various sizes are rather evenly represented.

For the questionnaire, the ESF adapted several questions from the study on *The added value of the doctorate degree for employers* carried out by the Observatory of Research and Scientific Careers FNRS with the support of Fédération Wallonie Bruxelles⁴. The DocEnhance questionnaire was focused on a small number of relevant areas such as PhD skills, PhD recruitment and added value of the PhD⁵. The list of skills used for the non-academic stakeholder questionnaire was the same as the list used for PhD holders within the DocEnhance career-tracking survey⁶. The questionnaire was in English and divided into 4 sections: 1) organisation; 2) recruitment of doctorate holders; 3) skills and competencies; 4) collaboration with universities and research. It included 24 questions and took about 10-15 minutes to complete. In the current report, we focus on the findings regarding two key areas – skills and competences of PhD holders and recruitment of doctorate holders by non-academic employers.

Comparing the PhD holders' supply and demand of skills

This section shows a comparison between the self-perception of skills acquired by PhD holders and the skills required by employers at work.

On the one hand, doctorate holders (those who concluded their PhD between 2016 and 2020) from nine universities (Maastricht University, the Technical University of Munich, the Arctic University of Norway, the Aristotle University of Thessaloniki, NOVA University Lisbon, Matej Bel University, the University of Alcalá, the University of Sassari and the University of Chemistry and Technology in Prague) were asked about their self-perception on 24 skills clustered in five groups (research skills, personal skills, professional skills, communication skills and management skills) at PhD completion. Answers used a 5-point Likert scale from 1=Very dissatisfied to 5=Very satisfied. Results are based on the 2,217 valid responses received (23% of the target population).

On the other hand, the questionnaire for employers outside the academia asked them to rank how important were the same set of skills for jobs occupied by doctorate holders at their organisation. Answers used a 5-point Likert scale from 1=Not at all important to 5=Extremely important.

Based on the average for each skill, we compare the PhD holders' skills supply and demand according to the sector of current employment distinguishing between **all sectors** (Figure 1 'All sectors'), **the private sector** (Figure 1 'Business sector') and **other non-academic sectors**

⁴ Publications from this survey published on the website: <https://observatoire.frs-fnrs.be/publications.html>

⁵ See link with the online questionnaire: <https://docenhance.eu/survey-among-non-academic-employers-on-the-added-value-of-a-phd/>

⁶ See above the report from the European Science Foundation.



e.g., government, healthcare, etc. (Figure 1 'Other sectors'). The annex includes the definition for all skills used.

Overall, across all sectors, doctorate holders and employers seem to agree that **personal skills** (critical-analytical thinking, problem-solving, creativity, flexibility, personal effectiveness, and resilience) are particularly important with all the skills within this group of skills scored with 4 or more points when all sectors are taken into consideration, and for 'Other non-academic sectors' when they are split. In addition, **team working** (4.2) and **effective communication** (4.1) are also relevant for employers while the majority of **communication** skills (except digital communication), **subject knowledge** (4.3) and **methodology** (4.2), are scored high by doctorate holders at PhD completion.

Results are similar when we compare the private sector with other non-academic sectors. For PhD holders working in the private sector, personal skills, subject knowledge, methodology, team working, and languages are all scored with 4 or more points while employers from the same sector do not consider flexibility (3.8) and personal effectiveness (3.9) as important as other skills.

Employers working in other non-academic sectors gave high value to subject knowledge, all personal skills, team working, effective communication, digital communication, and project management. However, PhD holders working in the same sector do not score as high as other skills digital communication (3.9) and project management (3.8). For both employers and PhD holders, intellectual property is the least scored skill (3.2 and 3.0 respectively) while employers give low values to self-branding (3.2) and doctorate holders rank low entrepreneurship (3.1).

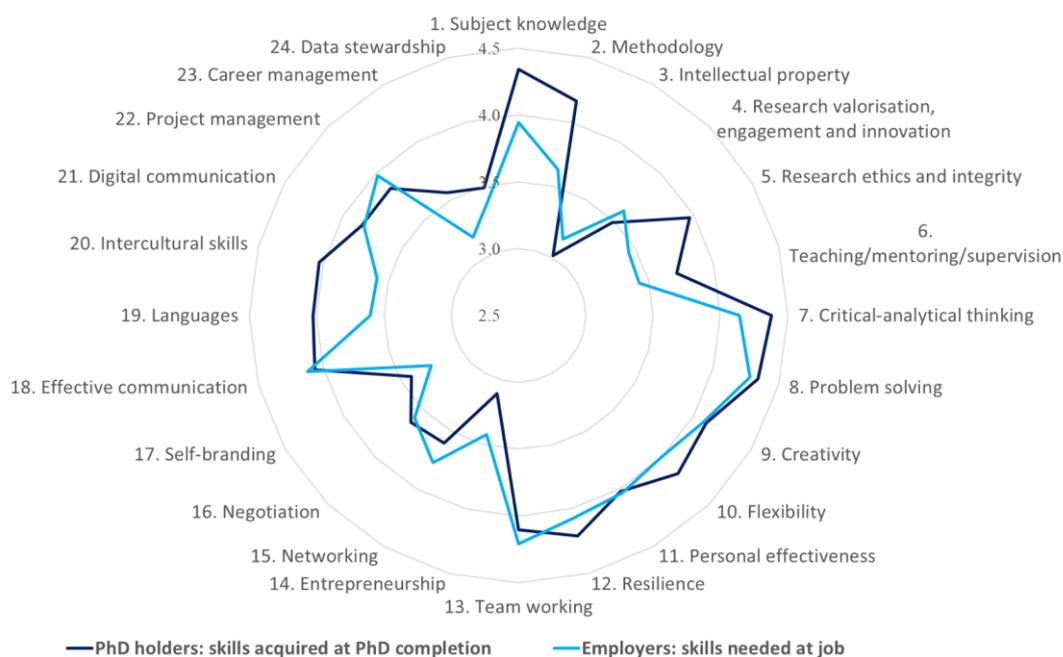


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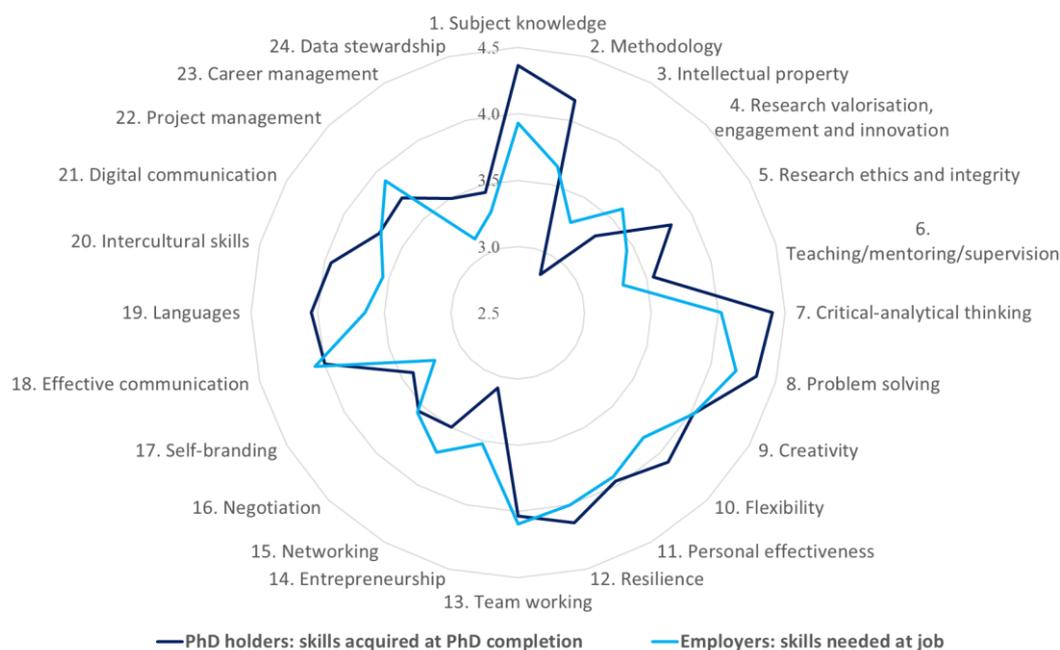


Figure 1. Comparison between skills supply and demand for PhD holders in different non-academic sectors of employment

All non-academic sectors (e.g., business, government, healthcare or not-for-profit sector)

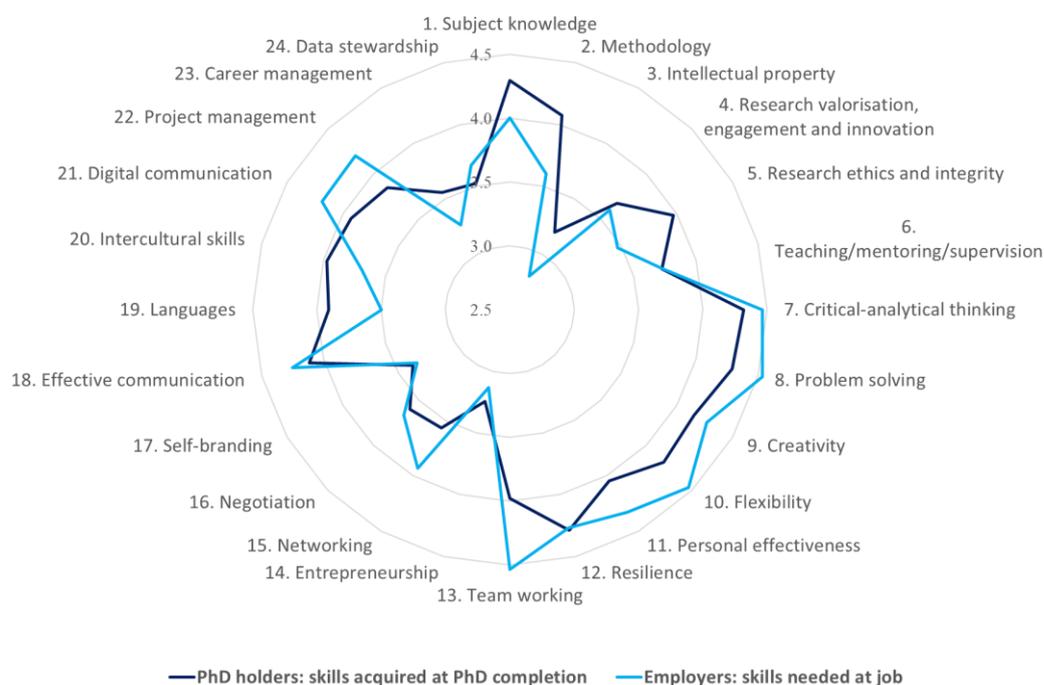


Business sector (i.e., industry, services, or other sectors)





Other non-academic sectors outside the business sector (i.e., government or another public sector, healthcare, private not-for-profit, or other sectors)



Note: Skills measures using a Likert scale from 1 to 5. Clusters: 1-6 Research skills; 7-12 Personal skills; 13-17 Professional skills; 18-21 Communication skills; 22-24 Management skills.

In general, results suggest that doctorate holders feel prepared for the job market because for the majority of the skills, PhD holders rank higher skills at PhD completion compared to employers. For example, scores provided to subject knowledge, methodology, research ethics, languages, intercultural skills, and career management are 0.4 points or higher at PhD completion compared to the job requirement. On the contrary, entrepreneurship and networking present 0.3 and 0.2 points of difference in favour of employers given scores.

The skills match between employers and PhD holders is more evident in the business sector than in other non-academic sectors. Looking at the business sector, PhD holders rank higher than employers in the majority of the skills, in particular subject knowledge and methodology, research ethics, critical-analytical thinking, languages, intercultural skills and career management (0.4 points of difference or more). **Important differences appear for intellectual property, research valorisation and entrepreneurship where PhD holders seem to be under-skilled.**

In the case of other non-academic sectors, there are more skills ranked higher by employers than by PhD holders, although the differences are small (0.2 points on average). **The skills**



with the highest skill gap appear in team working (0.6), networking (0.4) and project management (0.4). On the contrary, PhD holders report higher scores for methodology (0.5), intellectual property (0.4), research ethics (0.5) and languages (0.4).

Employers' open-ended responses on PhD skills

The questionnaire included an open-ended question (Question 16) concerning additional skills that are important for non-academic employers of PhD holders that were not listed in the questionnaire. In all, 17 employers answered this question (12 employers from the business sector and 5 employers from the other sectors).

As for the business sector, several respondents highlighted the importance of various business skills: e.g., **adaptation to firm's standards, business-oriented approach, understanding and balancing "the need for speed" and risk policies of the company.** Three respondents mentioned leadership and proactivity. One respondent mentioned that **PhD holders elevate the company profile**, making it, for instance, look more prestigious when applying for funding. Important are also skills which relay to **communication and teamworking**, for example, cooperation, people-to-people interaction, openness for discussion, building trust and information sharing.

As for the other sectors, several skills are considered important for PhDs to have in their organisation: staff and budget management, entrepreneurship, good knowledge of the academic landscape, relevant experience in the field as well as the capacity to continuously learn in a wide range of topics (scientific and business).

Employers were also asked an open question on the skills doctorate holders **lack the most** in the workplace (Question 17). In total, 22 answers from respondents in the business sector and 8 answers from the employers from the other sectors were collected. In the business sector, **practical experience outside the academia** was mostly mentioned (12 answers were related to missing practical skills – e.g., practical problem-solving, practical experience in projects), followed by the **lack of industry knowledge and business skills** (e.g., knowledge on intellectual property, value-creation perspective from a business standpoint, ability to accept the speed of the industry world and to treat with clients) and **project management, team working, team management.** Some respondents mentioned that PhD holders seem to lack the ability to connect theory and practice and to get to the point quickly instead of doing long research, to adapt to reality outside academia and to work on topics outside their specialty.

Outside the business sector, similarly, the following skills were mentioned to be lacking: adaptation to business semantics, staff and budget management, practical skills and real work experience, being concise (instead of a very theoretical approach), teamworking, networking and public relations.

When asked for **recommendations to help PhD programmes train more "industry- and society-ready" researchers** (Question 25), respondents from the business sector suggested the following: enhancing business skills of PhDs (e.g., "knowledge how venture capital firms



operate”, “knowledge of how industry operates”), collaborating with industry (e.g., “especially in European projects”), bridging the gap between universities and private businesses (e.g., long-term knowledge vs. more short-term goals), engaging PhD researchers in real projects and internships in the private sector, organising joint workshops and training with industry. One respondent highlighted the need to better valorise the PhD degree by the private sector. Another mentioned that most PhDs have developed perceptions of the private sector as “bad”, “boring” or “mundane” and that doctoral programmes should instead provide knowledge on the benefits of working in the private sector and training in the relevant skills. Employers from the other sectors suggested providing training in transferable skills (e.g., staff and budget management), stressing the fact that PhDs should be aware they would not necessarily work in research and therefore need to also develop these general competences as well as real, “on-the-ground experience in areas they are interested in”.



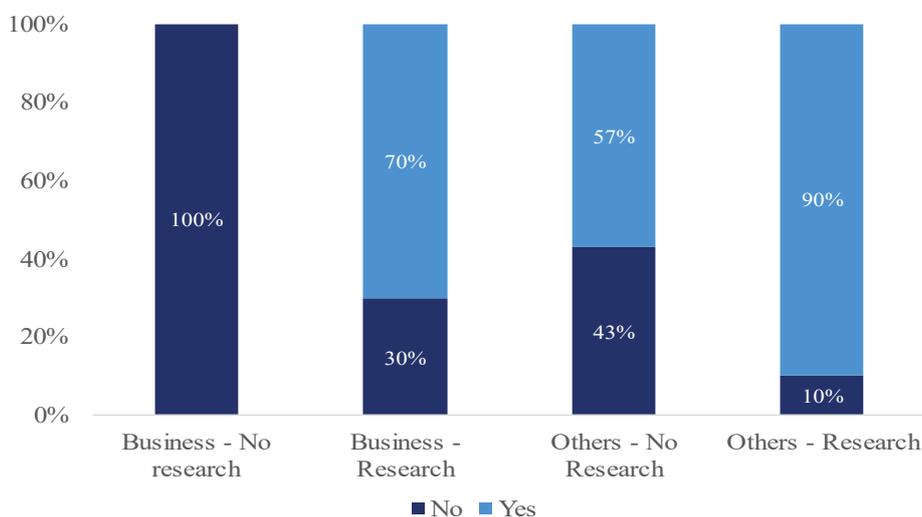
Recruitment of doctorate holders

This section focuses on the recruitment of doctorate holders. In particular, it intends to understand the importance and value-added of PhD holders for organisations, the reasons for (not) hiring doctorate holders as well as collaboration activities between non-academic institutions and universities or research institutions. The section is structured in two parts. First, we categorize respondents according to the sector of employment and the engagement in research and development activities (R&D). Four groups are created accordingly: PhD holders in the business sector not engaged in R&D activities (business - no research), PhD holders in the business sector engaged in R&D activities (business - research), PhD holders in other sectors (Government or another public sector, Healthcare sector, Private not-for-profit sector, Other) not engaged in R&D activities (Others - no research) and PhD holders in other sectors engaged in R&D activities (Other – research). Second, we replicate the analysis but distinguish by firm size (less than 50 employees versus 50 or more) and engagement in R&D (research vs non-research) resulting in four categories when both are combined.

Recruitment of doctorate holders by sector and research activities

In our sample, 58% of the business sector recruits PhD holders compared to 76.5% of other organisations. Organisations with R&D activities are particularly interested in hiring PhD holders as 70% of firms in the business-research quadrant employ PhDs recruited as well as 90% of other organisations engaged in R&D. On the contrary, private firms not involved in R&D do not recruit PhD holders, while 57% of other non-academic institutions not involved in R&D do so.

Figure 2. Percent of organisations that employ PhD holders by sector and research engagement

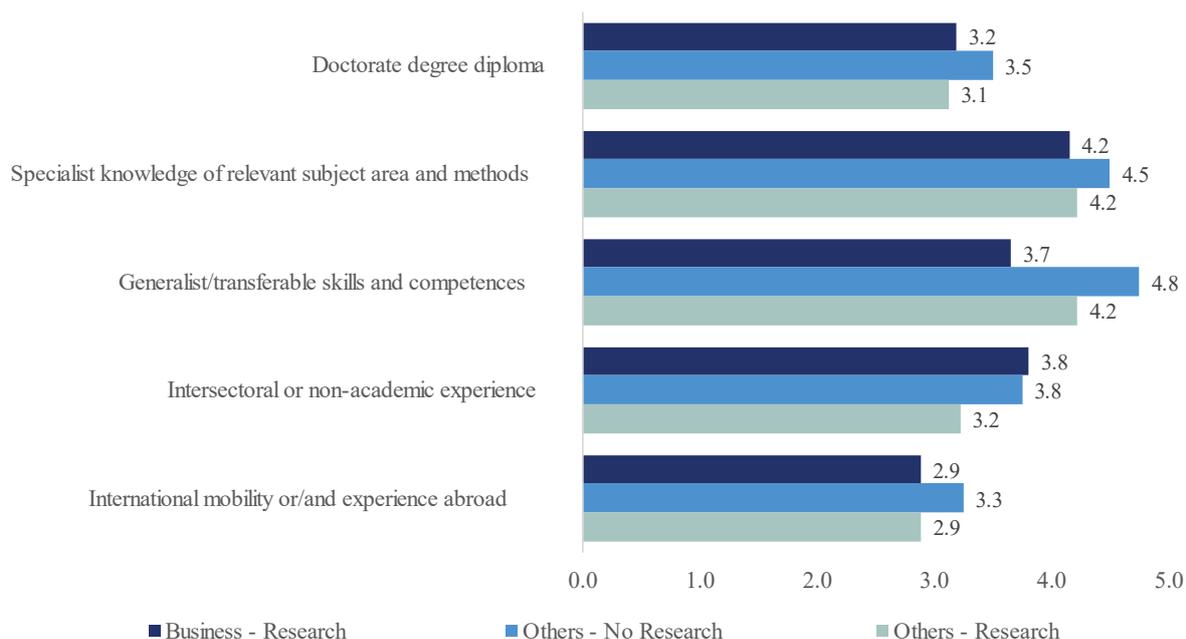


Respondents rated from 1 (not at all important) to 5 (extremely important) the importance of five aspects when recruiting/selecting doctorate holders. For those businesses engaged in R&D, the **knowledge specialization of relevant subject areas and methods** (4.2) is the main reason, followed by **intersectoral or non-academic experience** (3.8) and **generalist/transferable skills and competencies** (3.7). Similarly, employers from other sectors engaged in R&D, equally value specialist knowledge (4.2) and generalist/transferable skills and competencies (4.2), followed by intersectoral experience (3.8). Other non-academic



employers not engaged in R&D give highest importance to **generalist/transferable skills and competencies** (4.8) followed by **specialist knowledge of the relevant subject area and methods** (4.5). Having a doctorate degree diploma and international mobility experience are rated the lowest by employers in all sectors.

Figure 3. Importance of the following aspects when recruiting/selecting doctorate holders by sector and research engagement



Note: Only for those who employ doctorate holders

The value-added of PhD holders is particularly important for organisations engaged in R&D activities. In particular, 73% of business employers involved in R&D consider that doctorate holders have value-added for the organisation as well as 78% of other organisations engaged in R&D. 50% of the other employers not engaged in R&D activities consider that PhD holders give value to the institutions.

There are different ways in which organisations hire PhD holders. Business employers not involved in R&D activities prefer not to hire doctorate holders while private firms that do R&D are divided between those not looking specifically to hire PhD holders (50%) and looking for them specifically (47%). Other employers agree that they mainly do not look for doctorate holders (83% of those engaged in R&D and 78% not engaged in R&D).

Investigating the **reasons why organisations do not hire PhD holders**, business employers not engaged in R&D do not have activities that require PhD expertise (28.6%), or they believe PhD holders lack relevant skills (28.6%). The same reasons are explained by other organisations not involved in R&D (12.5%).



Figure 4. Value-added of doctorate holders for the organisation by sector and research engagement

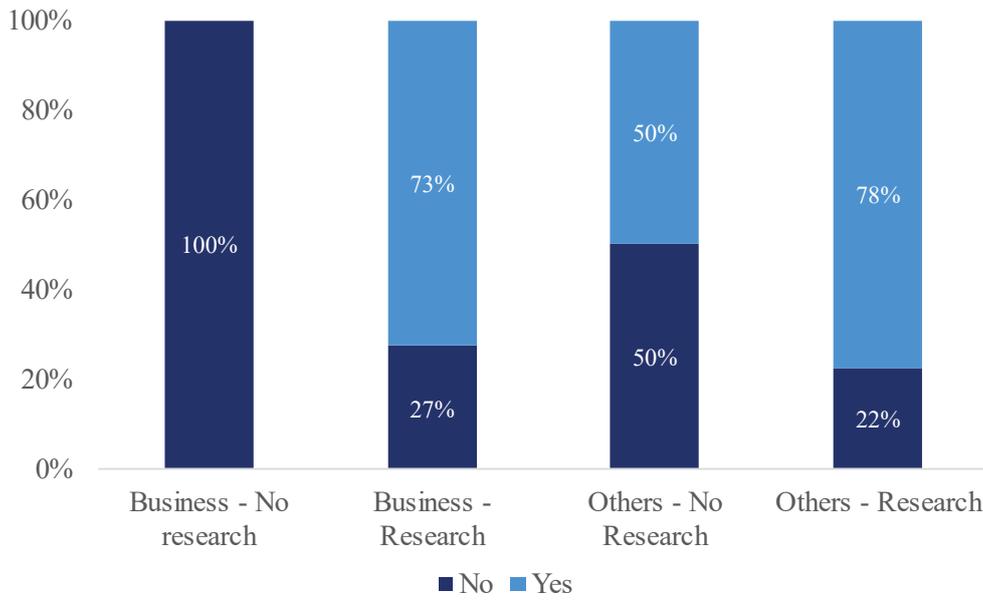
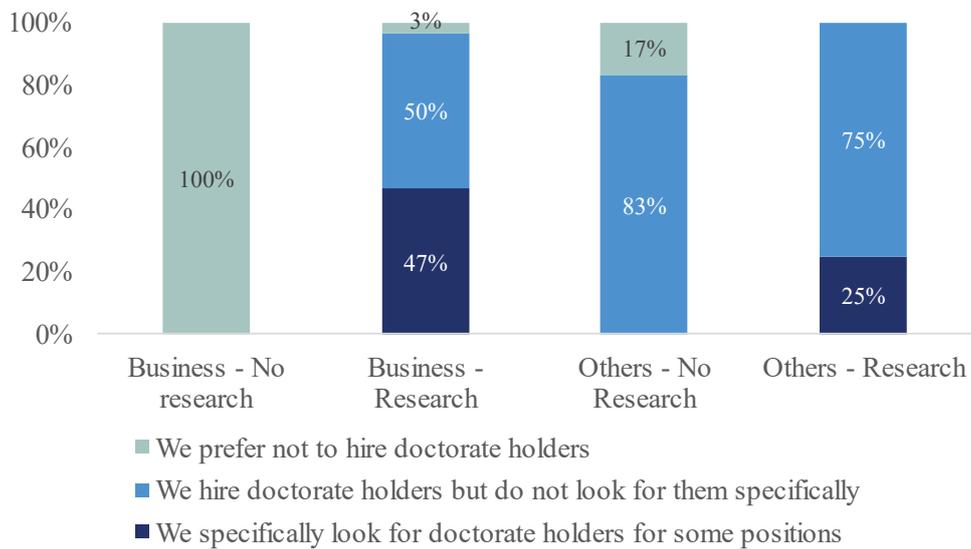


Figure 5. Interest in hiring doctorate holders in the organisation by sector and research engagement

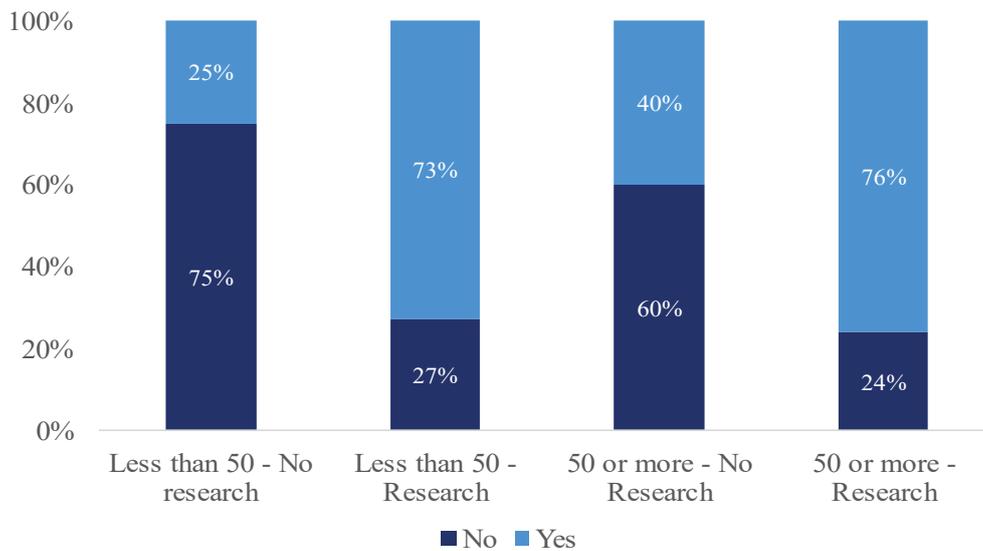




Recruitment of doctorate holders by firm size and research activities

PhD holders are hired by small and medium-sized organizations (less than 50 employees) and large (50 or more employees), in equal shares. **What really makes a difference, in this case, is their involvement in R&D activities.** 75% of small and 60% of large organizations not engaged in R&D activities do not recruit PhD holders. On the contrary, 73% of small and 76% of large organizations that do R&D activities include doctorate holders as part of their staff.

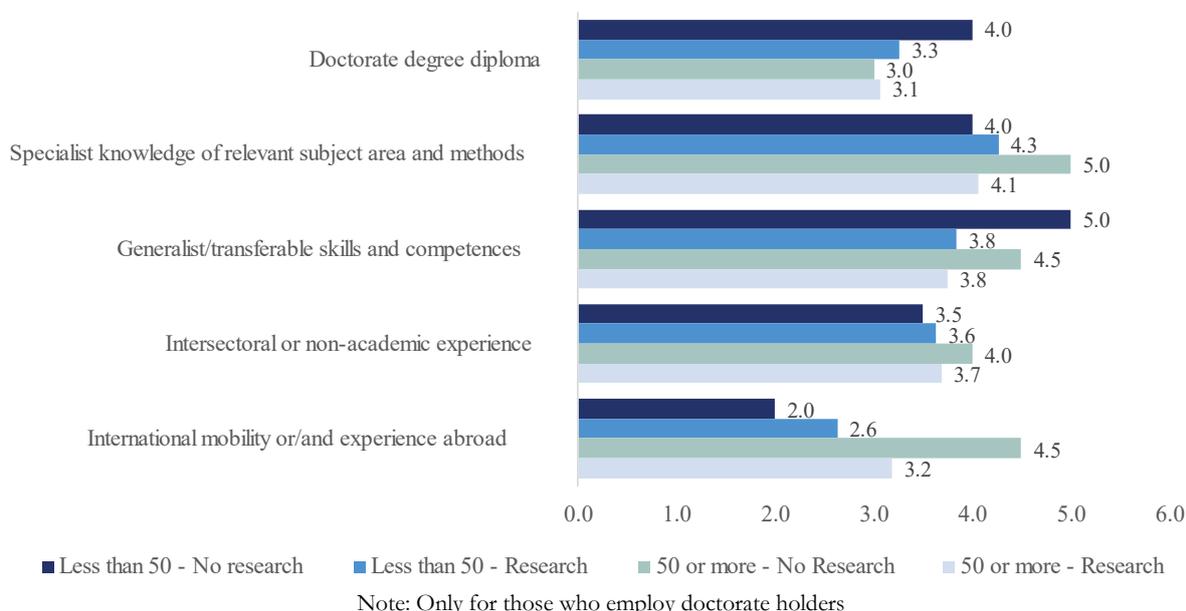
Figure 6. Percent of organisations that employ PhD holders by size and research engagement



Respondents rated from 1=not at all important to 5=extremely important, the importance of five aspects when recruiting/selecting doctorate holders. For small organisations not engaged in R&D, the generalist/transferable skill and competences (5.0) is the main reason, followed by specialist knowledge of relevant subject area and methods and doctorate degree diploma (4.0). For small firms engaged in R&D, recruiting PhD holders mainly relates to hiring specialist knowledge of relevant subject area and methods (4.3) This reason is also the main quoted by large organisations engaged in R&D (4.1). For large organisations without R&D, recruitment relates to acquisition of generalist/transferable skills and competences as well as international mobility and experience abroad (4.5). International mobility experience is generally the lowest rated aspect across all types of organisations, with one exception being large organisations not engaged in R&D where this aspect is among top three highest rated aspects (4.5).



Figure 7. Importance of the following aspects when recruiting/selecting doctorate holders by size and research engagement



The value-added of the doctorate is particularly important for organisations engaged in R&D activities. In particular, 79% of small organisations involved in R&D consider that doctorate holders have value-added for the organisation as well as 70% of large ones. On the contrary, only 29% of the small organisations not engaged in R&D activities consider that PhD holders give value to the institutions, similar to the 25% of the large ones.

To gauge the interest of employers in hiring PhD holders and shed light on the recruitment process, we asked how interested they are in hiring doctorate holders. Small organisations not involved in R&D prefer not to hire doctorate holders (57%) while those who are involved are divided between those who hire PhD holders but do not specifically look for them (44%) or those who especially looking for PhD holders (50%). Among large organisations, the main reason relates to hiring doctoral holders but not looking for them specifically (67% of those not involved in R&D compared to 65% of those with R&D activities).

Investigating the reasons **why organisations do not hire PhD holders**, small organisations not engaging in R&D do not have activities that require PhD expertise or the lack relevant skills of PhD holders (37.5% and 25% respectively). Lack of skills is also mentioned by large firms not involved in R&D as well as other reasons (14.3%). For those with less than 50 employees performing R&D activities, lack of relevant skills and non-suitable professional experience are the most mentioned options (4.5%).



Figure 8. Value-added of doctorate holders for your organisation by size and research engagement

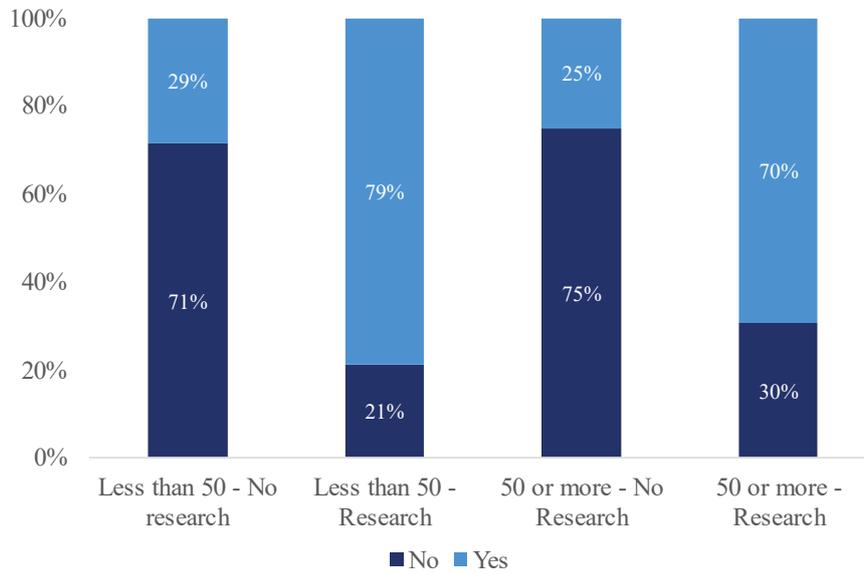
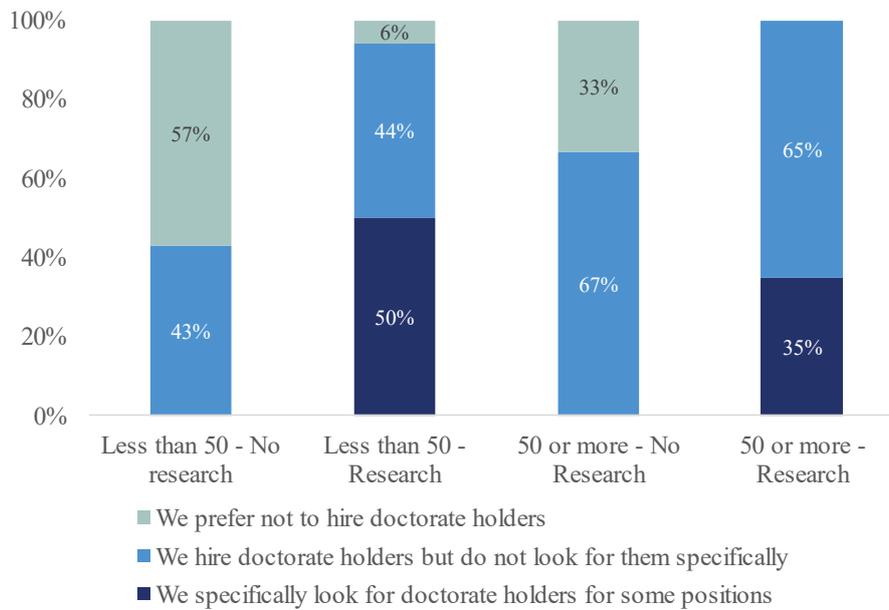


Figure 9. Interest in hiring doctorate holders in the organisation by size and research engagement





Discussion and Conclusions

The current report provided results on two main areas: PhD holders' supply and demand of skills (on the basis of the DocEnhance surveys of PhD holders and PhD employers), as well as PhD recruitment by non-academic employers and their perception of the added value of the doctorate.

PhD skills relevance for non-academic employers

Overall, PhD holders and non-academic employers across all employment sectors agree that **personal skills** (e.g., critical-analytical thinking, problem solving, creativity, etc.) are particularly important. In addition, transferable skills such as **team working**, and **effective communication** are rated highly by non-academic employers. As for PhD holders, communication skills, as well as subject knowledge and methodology are rated highest.

In general, **doctorate holders appear to be well prepared for the jobs outside the academia** as for the majority of skills, PhD holders rank higher skills at PhD completion compared to employers (e.g., subject knowledge, methodology, research ethics, languages, intercultural skills or career management). Some minor gaps can be seen in entrepreneurship and networking skills. For the non-academic employers, subject knowledge and methodology of PhD holders is valued at similar levels as e.g., personal skills or project management, while PhD holders rate their subject knowledge and methodology skills as their top skills, alongside with critical-analytical thinking and problem-solving skills. This is in line with the findings of the PhD career-tracking survey indicating that the PhD holders employed across the non-academic sector jobs rated their subject knowledge and other academic competences higher than their actual importance in their current jobs (in stark contrast with those working in universities or research organisations).

When comparing across the sectors, the skills match is closest among PhD holders and employers in the private sector, then in other non-academic sectors. Some skills gaps in the private sector are in **intellectual property, research valorisation and entrepreneurship** skills. For other non-academic sectors, there are more skill gaps: e.g., in **team working, networking and project management**. Open-ended comments highlighted the need for PhDs to develop practical skills and experience, business skills and generic skills (e.g., project management, team working, etc.), through collaboration with industry (e.g., joint projects), internships and skills training.

PhD recruitment in non-academic organisations

Looking at PhD recruitment, this report analysed the data taking into account such aspects as 1) organization's sector and involvement in R&D activities and 2) organisation's size and involvement in R&D activities. Of organisations that are involved in R&D activities, 70% in business and 90% in other non-academic sectors employ PhD holders. Businesses not involved in R&D do not have any employed PhD holders, while 57 % of other sector organisations not involved in R&D (in e.g., government, NGOs, healthcare, etc.) have PhD holders among their employees.



PhD holders are hired by small, medium-sized and large organizations in equal shares. **It is the organisation's involvement in R&D rather than the size of the organisation that appears to make a difference on whether or not PhD holders are employed.**

When recruiting PhD holders, employers with R&D activity in the business and other sectors value their subject knowledge of relevant subject area and methods, as well as intersectoral or non-academic experience and transferable skills and competences. Non-academic employers not engaged in R&D rate transferable skills and competences as most important, followed by subject knowledge.

When it comes to the appreciation of the added value of PhD holders to the organization, the findings suggest that **organisations engaged in R&D, small or large, across all sectors, that seem to value PhD experience most** (73% for the private sector, 78% in other non-academic sectors; 79% of small organizations and 70% of large ones). Among organisations that are not engaged in R&D across all sectors, only 50% consider PhD an added value for the organization. Less than 30% of small or large organisations not engaged in R&D do not consider PhD holders to bring value to their organization.

Similarly, with regard to their interest in hiring PhD talent, it is **organisations in the private sector that are engaged in R&D that have the highest share of those that specifically look to hire PhD holders (47%)**. Outside the private sector, a vast majority of organisations whether in R&D or not, hire PhD holders but do not specifically look for the PhD holders. When looking at the size of the organization, it seems that larger organizations both with and without R&D activities, mostly hire PhD holders without specifically looking for them. Small organisations without R&D prefer not to hire PhD holders and of those with R&D, 50% look for PhD holders specifically.

Thus, **while PhD appears to be a desired degree for non-academic employers and more than half of the respondents consider it an added value, employers most often do not look for PhDs specifically** when recruiting talent. The DocEnhance career-tracking survey of PhD holders demonstrated that over 50% of PhD graduates work in non-academic sector jobs and that a vast majority of those did not formally require a PhD to be hired for their job (e.g., 79% of those in the private sector, 94% in the government, or 92% in the NGO sector). Thus, the value of PhD cannot be fully understood through such indicators alone as the required level of education of the job. The added value of the PhD for non-academic employers, and the ways in which to help better valorize the PhD and acquired skills by non-academic employers should be further explored.



Annex 1: List of skills

The list of competencies and personal attributes from the above-mentioned report, the OECD survey “Careers of Doctorate Holders” (Auriol et al., 2013)⁷ and from the “Career Tracking Survey of Doctorate Holders” (ESF, 2017)⁸ were used as a starting base for creating a (non-exhaustive) list of 24 skills and their definitions clustered in five groups:

a) Research skills:

- Subject knowledge: demonstrating a theoretical and practical understanding of your subject area and its wider research context.
- Methodology: applying research methodologies, tools and techniques appropriately.
- Intellectual Property (understanding how to manage Intellectual Property rights, e.g. how to file a patent).
- Research valorisation, engagement, and innovation: understanding principles, rules, values and professional standards governing research for ensuring scientific rigour, honesty, trust and confidence.
- Teaching/ mentoring/ supervision: using appropriate tools and methods to facilitate learning and assessment, to encourage and support learners developing their potential.

b) Personal skills:

- Critical-analytical thinking: critically analysing and evaluating findings and results.
- Problem-solving: formulating and applying appropriate solutions to problems and challenges.
- Creativity: being imaginative, thinking out of the box and developing new insights.
- Flexibility: responding quickly to changes and adapting easily to new situations.
- Personal effectiveness: making use of the resources at your disposal (e.g. time, skills and talents) to achieve professional and personal goals.
- Resilience: ability to cope with and overcome challenges and setbacks on a daily basis, including adaptation to change.

c) Professional skills:

- Team working: working constructively with colleagues, acknowledging their contribution.
- Entrepreneurship: ability and willingness to develop, organise and manage a business venture along with its risks.

⁷ Auriol, L., M. Misu and R. Freeman, *Careers of Doctorate Holders: Analysis of Labour Market and Mobility Indicators, OECD Science, Technology and Industry Working Papers, No. 2013/04* (Paris: OECD Publishing, 2013), <https://doi.org/10.1787/5k43nxgs289w-en>.

⁸ European Science Foundation, *2017 Career Tracking Survey on Doctorate Holders* (Strasbourg: ESF, 2017)



- Networking: developing, maintaining, and using networks or collaborations.
 - Negotiation: ability to discuss, communicate and cooperate for reaching an agreement.
 - Self-branding: the ability to properly identify your personal skills and to communicate them to different audiences.
- d) Communication skills:
- Effective communication: communicating information effectively and confidently to different audiences.
 - Languages: communicating effectively in a language other than your mother tongue.
 - Intercultural skills: having acquired cultural sensitivity and openness to other cultural horizons and viewpoints.
 - Digital communication: using the newest digital tools to undertake, manage and promote research, products, or goals to the public.
- e) Management skills:
- Project management: effectively planning, managing, and delivering projects on time.
 - Career management: actively manage your professional development.
 - Data stewardship: handling information and knowledge to facilitate their management, ensuring data meets FAIR standards.



Annex 2: Summary statistics

Summary statistics of the online stakeholder consultation: Understanding the value-added of a doctorate for employers outside the academia

1 – Your organisation

Q1 - In which country is your organisation located?

	Total		Business		Others	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Austria	1	1.5%	1	2.1%	0	
Belgium	1	1.5%	0		1	5.6%
Finland	1	1.5%	0		1	5.6%
France	6	9.2%	3	6.4%	3	16.7%
Germany	1	1.5%	1	2.1%	0	
Greece	2	3.1%	1	2.1%	1	5.6%
Lithuania	1	1.5%	0		1	5.6%
Netherlands	2	3.1%	1	2.1%	1	5.6%
Norway	17	26.2%	13	27.7%	4	22.2%
Poland	8	12.3%	8	17.0%	0	
Portugal	4	6.2%	4	8.5%	0	
Spain	18	27.7%	13	27.7%	5	27.8%
United Kingdom	2	3.1%	1	2.1%	1	5.6%
United States of America	1	1.5%	1	2.1%	0	
Total (Count)	65		47		18	

Q2 - Does your organisation have multiple sites in more than one country?

	Total		Business		Others	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
No	46	70.8	31	66.0	15	83.3
Yes	19	29.2	16	34.0	3	16.7
Total (Count)	65		47		18	

Q3 - What is the sector of your organisation?

	Freq.	Percent
Business sector: industry	28	43.1
Business sector: services and other	19	29.2
Government or another public sector	5	7.7
Healthcare sector (e.g. hospital, clinical centre)	3	4.6
Private not-for-profit sector	6	9.2
Other	4	6.2



Total (Count)	65
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For the rest of summary statistics, results will be presented distinguishing by business (including industry and services) and others (including government/public sector, healthcare, private not-for-profit sector and others).

Q4 - Does your organisation engage in R&D activities (e.g. publications, patents, new products and solutions...)?

	Total		Business		Others	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
No	15	23.1	7	14.9	8	44.4
Yes, occasionally	26	40	20	42.6	6	33.3
Yes, continuously	23	35.4	19	40.4	4	22.2
I don't know	1	1.5	1	2.1		
Total (Count)	65		47		18	

Q5 - What is the number of employees working in your organisation? (Please include all campuses/branches and subsidiaries, a rough approximation is fine.)

	Total		Business		Others	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Less than 10 employees	14	21.5	9	19.1	5	27.8
Between 10 and 49 employees	17	26.2	13	27.7	4	22.2
Between 50 and 249 employees	16	24.6	14	29.8	2	11.1
Between 250 and 499 employees	4	6.2	3	6.4	1	5.6
500 or more	14	21.5	8	17.0	6	33.3
Total (Count)	65		47		18	

Q6 - What is your position?

	Total		Business		Others	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Human Resources manager position	12	18.8	9	19.1	3	17.6
Manager-level position (e.g. head of department/unit)	36	56.3	28	59.6	8	47.1
Other	16	25.0	10	21.3	6	35.3
Total (Count)	64		47		17	

Q7 - Do you have a doctoral degree?

	Total		Business		Others	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
No	41	63.1	31	66.0	10	55.6
Yes	24	36.9	16	34.0	8	44.4



Total (Count)	65	47	18
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2 – Recruitment of Doctoral Holders

Q8 – Are there currently any employees with a PhD in your organisation?

	Total		Business		Others	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
No, we have never had	18	29.0	16	35.6	2	11.8
No, but we have had in the past	3	4.8	1	2.2	2	11.8
Yes	39	62.9	26	57.8	13	76.5
I don't know	2	3.2	2	4.4		
Total (Count)	62		45		17	

Q9 – Please rate the importance of the following aspects when recruiting/selecting doctorate holders (1 = not at all important; 2 = slightly important; 3 = moderately important; 4 = very important; 5 = extremely important) (N=39)

	Total		Business		Others	
	Mea n	S.D .	Mea n	S.D .	Mea n	S.D .
Doctorate degree diploma	3.2	1.2	3.2	1.1	3.3	1.3
Specialist knowledge of relevant subject area and methods	4.2	0.9	4.2	0.9	4.3	0.9
Generalist/transferable skills and competences	3.9	1.0	3.7	1.1	4.4	0.8
Intersectoral or non-academic experience	3.7	0.9	3.8	0.8	3.4	1.0
International mobility or/and experience abroad	2.9	1.2	2.9	1.2	3.0	1.4
Total (Count)	39		26		13	

Note: Only for those who employ doctorate holders

Q10 – In your opinion, do doctorate holders have value-added for your organisation, e.g., compared to those with Master's level education?

	Total		Business		Others	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
No	19	31.2	14	31.1	5	31.3
Yes	34	55.7	24	53.3	10	62.5
I don't know	8	13.1	7	15.6	1	6.3
Total (Count)	61		45		16	

Q11 – How interested are you in hiring doctorate holders in your organisation?

	Total		Business		Others	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
We specifically look for doctorate holders for some positions	16	26.2	14	31.1	2	12.5



We hire doctorate holders but do not look for them specifically	26	42.6	15	33.3	11	68.8
We prefer not to hire doctorate holders	6	9.8	5	11.1	1	6.3
I don't know	13	21.3	11	24.4	2	12.5
Total (Count)	61		45		16	

Q12 – What are the ways by which you attract doctorate holders? (Percentage of Yes) (N=82)

	Total	Business	Others
Career fairs	3.1	2.1	5.6
Contacts with universities	18.5	23.4	5.6
Headhunters	3.1	4.3	
Job offers	13.8	17.0	5.6
Social media	9.2	8.5	11.1
Other	4.6	4.3	5.6
Total (Count)	65	47	18

Q13 – Please provide reasons for not hiring doctorate holders? (Percentage of Yes)

	Total	Business	Others
We do not have activities that require PhD expertise	4.6	4.3	5.6
Financial reasons			
No suitable professional experience	1.5	2.1	
Lack of relevant skills	6.2	6.4	5.6
We do not receive (enough) applications from PhD holders			
We do not have access to a pool of PhD holders			
Others	1.5	2.1	
Total (Count)	65	47	18

3 – Skills and competences

Q14 – What does PhD training involve in your opinion?

	Total		Business		Others	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Preparing a thesis in a specialist subject area to advance knowledge	46	70.8	36	76.6	10	55.6
Developing a broader set of transferable skills	31	47.7	22	46.8	9	50.0
Gaining specialized knowledge and work experience	35	53.8	23	48.9	12	66.7
All of the above	1	1.5	1	2.1		
Other	4	6.2	2	4.3	2	11.1
Total (Count)	65		47		18	



Q15 – How important are the following skills for jobs that could be occupied by doctorate holders at your organisation? (1 = not at all important; 2 = slightly important; 3 = moderately important; 4 = very important; 5 = extremely important)

Research skills and other academic competences

	Total		Business		Others	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Subject knowledge	3.9	1.0	3.9	1.0	4.0	1.1
Methodology	3.6	1.1	3.6	1.1	3.6	1.2
Intellectual property	3.2	1.2	3.3	1.1	2.8	1.5
Research valorisation, engagement, and innovation	3.6	1.0	3.6	1.0	3.6	1.2
Research ethics and integrity	3.4	1.2	3.4	1.2	3.5	1.4
Teaching/mentoring/supervision	3.4	1.1	3.3	1.1	3.7	1.2
Total (Count)	65		47		18	

Personal skills

	Total		Business		Others	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Critical-analytical thinking	4.1	0.9	4.0	0.9	4.5	0.6
Problem solving	4.3	0.8	4.2	0.9	4.5	0.5
Creativity	4.1	0.9	4.0	0.9	4.3	0.8
Flexibility	4.0	1.0	3.8	1.1	4.5	0.6
Personal effectiveness	4.0	1.0	3.9	1.0	4.3	0.7
Resilience	4.1	1.0	4.0	1.0	4.3	0.8
Total (Count)	65		47		18	

Professional skills

	Total		Business		Others	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Team working	4.2	0.8	4.1	0.9	4.5	0.7
Entrepreneurship	3.4	1.1	3.5	1.1	3.1	1.3
Networking	3.8	1.0	3.7	1.0	3.9	1.0
Negotiation	3.6	1.1	3.6	1.1	3.7	1.2
Self-branding	3.3	1.2	3.2	1.1	3.3	1.4
Total (Count)	65		47		18	

Communication skills



	Total		Business		Others	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Effective communication	4.1	0.9	4.1	0.9	4.3	0.9
Languages	3.6	1.0	3.6	0.9	3.5	1.3
Intercultural skills	3.6	1.0	3.5	0.9	3.7	1.1
Digital communication	3.8	1.1	3.7	1.1	4.2	1.0
Total (Count)	65		47		18	

Management skills

	Total		Business		Others	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Project management	4.0	1.0	3.9	1.0	4.2	0.9
Career management	3.2	0.9	3.1	0.9	3.3	1.2
Data stewardship	3.4	1.1	3.3	1.1	3.7	1.0
Total (Count)	65		47		18	

Q16 – List any other skills not mentioned here that it would be important to have for doctorate holders in your organisation

Sector	
Business	<ul style="list-style-type: none"> - PhD holders in my organisation (private sector) work mostly as project managers and thus are not treated any differently or expected to perform better than MBAs. The most important value that they bring to the company is that they elevate the company profile, making it look more prestigious when applying for funding. - Cooperation, language, understanding Europe - Easy-going and informal way of being. People to people interaction is all about building trust and opening up for discussion/information sharing, not only to showcase personal skills. - Understanding and balancing "the need for speed"/time to market - and risk policies of the company - No - "Can do" attitude - Adaptation to firms' standards - I don't know - N/A - Business oriented - Team leadership. - Proactive mindset
Others	<ul style="list-style-type: none"> - Staff management, budget management - Relevant experience on the "field". For example, experience in a law firm will be more important for us than a mere PhD. However, the combination of both can be very interesting. - Entrepreneurship - Good knowledge of the academic landscape



	<ul style="list-style-type: none"> - Remote work Capacity to continuously training in a wide range of topics (scientific and business)
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Q17 – In your opinion, what skills do doctorate holders lack most or what difficulties they may experience in the workplace

Sector	
Business	<ul style="list-style-type: none"> - Adaptation to reality outside academy. - Lack of industry knowledge and experience. Lack of knowledge on intellectual property. - Lack of business-specific knowledge, and some lack of value-creation perspective from a business standpoint. - Project management and communication skills. - Practical experience in projects - Perhaps being too oriented toward one's own profession and academic practices? Lack of understanding about how private businesses functions and operate? - Practical effective problem-solving skills - I am afraid that they would be to academic, theoretic, and to little practical. To be able to connect theory and practice is hard, and to accept that often theory does not fit very well with real life I can imagine also would be hard for someone who has spent years proving importance of theory. - We have tried out 2 persons with PhD - and luckily, they have been perfect both working in teams and also challenging topics outside their specialty - It's Spain. To be cheap - Difficulty working in a team - Working in real company, not on university only - Focus on the common goals - They lack understanding of firm's organisation - More usual gaps on communication, management by objectives, and leadership at the team management - Academic elephants - Practice experience, get to the point at a short period of time instead of doing long research - We have a big difference between the academic world and the world of industry. PhDs holders often are not ready to accept the speed of the industry world. Sometimes they are missing the "practical" experience. - Difficulty working on topics outside their specialty - Team working and team leading. - They are not used to teamwork, project management and client relations - I think it cannot be generalised. Some lack important skills, and others have an abundance of skills. Probably, most of them just lack the knowledge of the world outside of academia, but this is not always the case either, and there are different degrees of "ignorance"
Others	<ul style="list-style-type: none"> - Staff management, budget management - Team working, networking and public relations, managerial skills



	<ul style="list-style-type: none"> - Difficulty to be concise and to be down-to-earth (too much of a theoretical approach). - Real work experience - Practical skills - Flexibility in accepting others' methodologies and entrepreneurship - Ability to do things even if they do not find it interesting - Adaptation to the business semantics (i.e., teaching vs training, reporting, metrics...).
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Q25 – What other recommendation(s) would you propose for PhD programmes to make researchers more “industry- and society- ready” and to foster collaboration with non-academic sector organisations and firms?

Sector	
Business	<ul style="list-style-type: none"> - All researchers/PhD students should absolutely know, in a significant detail, how venture capital firms operate because that it's the most fruitful vehicle to transform a good idea into a successful business. Also, additional mandatory Business knowledge would be extremely valuable to make sure that all researchers have enough knowledge/tools to create a successful business model based on the ideas that come from their research. - Most PhD students believe that they will become tenured professors someday. Most of the times, this is an unrealistic belief, as in the end most do not eventually manage to get such a position. Also, most PhDs believe that working in the private sector is "bad", "boring", "mundane", "without meaning", etc. All these conceptions should be brought down to a more realistic level of understanding. PhDs should become more aware about the valuable (life) skills they can develop as well as the benefits of working in the private sector. - Cooperate with industry especially in European projects and be active to involve industry in Research and Innovation Actions - Finding the right balance between the requirements set by academic institutions and the needs of businesses. Understanding the differences in how universities/R&D institutions and private businesses expect results from R&D activities (long term knowledge building vs. more short-term goals). - Engage them in real projects - Make the owners/CEOs value this profile and what can come from R&D - Work of similar visions driving humankind progress (ecology, social wellbeing, humanities and women employment programs, European consortiums). Find how to mix with understanding of firms' organisations and networks. - Have the opportunity to work/do research (internship) in the industry area, organize workshops and trainings to bring closer these 2 worlds (Academic & Industry) - Include the patent granting as possible requirement for obtaining a PhD
Others	<ul style="list-style-type: none"> - Insert staff management training, budget management training + internship in nonacademic organisations - Holding a PhD does not necessarily mean you will work in research. So, get real field / on the ground experience in the areas you are interested in, so that in the end you have both.



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	<ul style="list-style-type: none">- The weight should not be only on the shoulders or academia and researchers but shared with non-academic organisations. It's more interesting to hire a very good researcher than a mid-level one. Business skills can be learnt by intern training.
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