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market

2023

EMPLOYMENT OUTCOMES OF DOCTORAL GRADUATES OF CATALAN UNIVERSITIES



AQU CATALUNYA



2023

EMPLOYMENT OUTCOMES OF DOCTORAL GRADUATES OF CATALAN UNIVERSITIES

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INTRODUCTION

This report presents the results of the sixth study on employment outcomes of doctoral graduates of the Catalan university system. The study is part of the research carried out every three years by AQU Catalunya to provide data and benchmarks on the quality of the employment outcomes of survey respondents three years after graduating.

The aim of this report is to encourage reflection that will lead to improvements in the PhD programmes offered by Catalan universities. This new cycle of research on employment outcomes has once again benefited from the invaluable participation and support of the social councils of Catalonia's public and private universities.

The data collection survey covers a wide range of factors related to employment (employment/unemployment, sector, workplace), employment quality (suitability of work, job stability, salary, etc.) and graduates' satisfaction with their education (skills acquired, willingness to take the same PhD programme again, etc.). A total of 2,490 doctoral graduates took part, representing 62.9% of the target population, i.e. people who completed PhDs at Catalan universities in the 2017-2018 and 2018-2019 academic years. Details of the sample can be found in the data sheet at the end of the report. With the surveys conducted to date, we have nearly 9,500 total responses in our database. This is valuable information for analysing the employment outcomes of doctoral graduates from the Catalan university system.

The results of this study can be summarised as follows:

- > Virtually all doctoral graduates are employed within three years of graduating, but only half perform functions at work that match their level of education.
- > The ability of companies to absorb talent has increased in recent years: they currently employ more than half of all new doctoral graduates (59%). Only a third of these employees perform functions at work in accordance with their level of education, but most enjoy job stability and higher salaries.
- > Universities and research centres are becoming less common as workplaces for new doctoral graduates. Although they provide jobs that are well suited to graduates' level of education, they tend to have higher rates of temporary employment and offer lower salaries than companies.
- > In terms of temporary/permanent employment, the share of permanent contracts has increased in the private sector since 2020, but has slightly decreased in the public sector. This is the case for all workplaces.
- > Overall job satisfaction is high in all workplaces (universities, research centres and companies).
- > Doctoral graduates best acquire "traditional" skills such as independent and self-directed work, the ability to generate new knowledge, and the ability to publish and present results. Meanwhile, they report less acquisition of skills considered "more modern", such as the ability to seek funding and manage resources for research.
- > Compared to 2020, there has been a significant improvement in the percentage of doctoral graduates who covered the cost of their studies with a grant.

- > Around 8 out of 10 doctoral graduates say they would take the same PhD programme again.

This report is primarily based on information gathered through the graduate survey. In order to contextualise and benchmark the results, it also draws on data from the UNEIX Catalan University Information System, which is coordinated by the Secretariat for Universities and Research of the Government of Catalonia, and data from the Spanish National Statistics Institute (INE). We would like to thank these institutions for their collaboration, as well as the graduates who took part in the survey. Without their participation, this study would not have been possible.

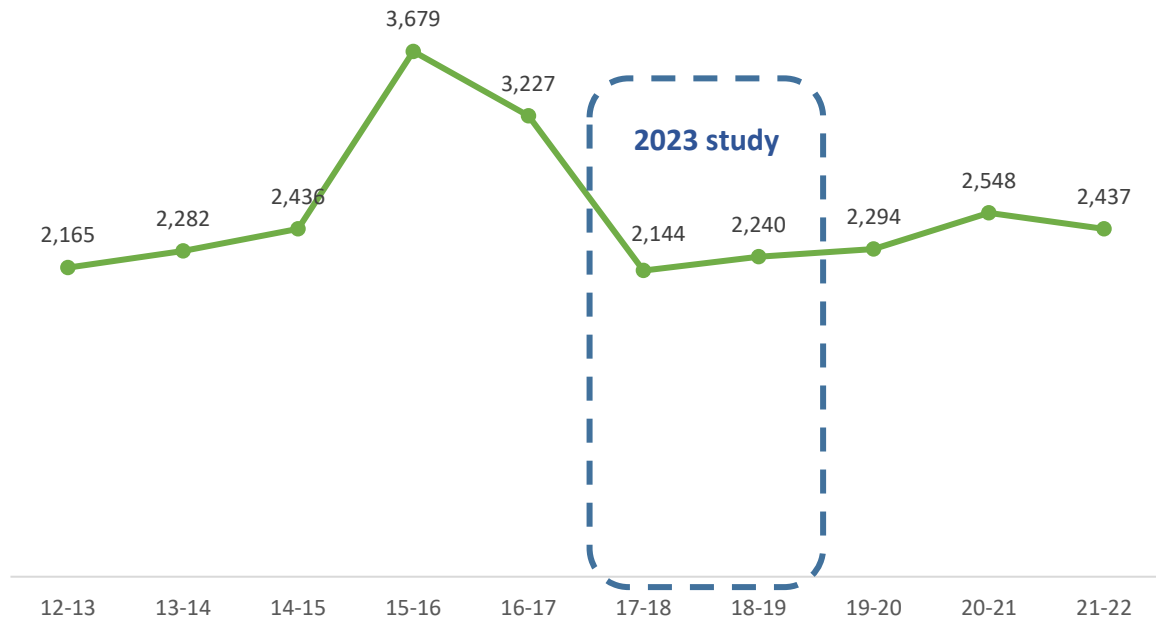
We hope that this report will prove insightful to those wishing to gain a deeper understanding of the Catalan university system and its impact on the labour market. More importantly, we hope that the data and findings presented here will be used to improve the PhD programmes in Catalonia.

Jaume Valls Pasola, Director of AQU Catalunya

POPULATION DATA ON CATALONIA

> Trend in the number of doctoral graduates in Catalonia

Figure 1. Trend in the number of doctoral graduates of Catalan universities

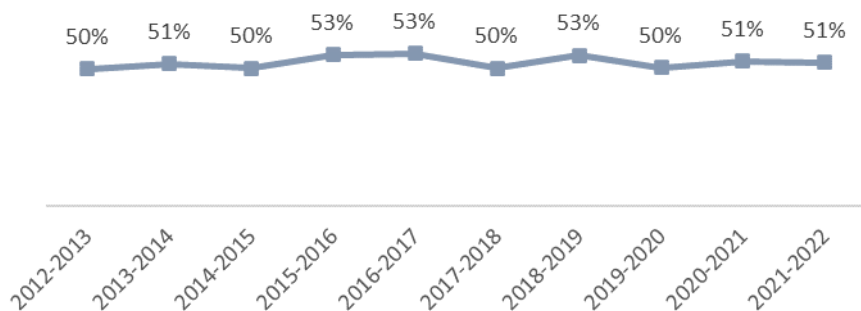


Note: affiliated centres come under the university to which they are affiliated.
Source: UNEIX.

Around 2,000 people graduate from PhD programmes in Catalonia each year

- > Following a spike in the 2015-2016 academic year, which was due to the phasing out of old programmes, the trend has levelled off at figures similar to those from before.
- > The percentage of female doctoral graduates has remained stable over the last ten years.

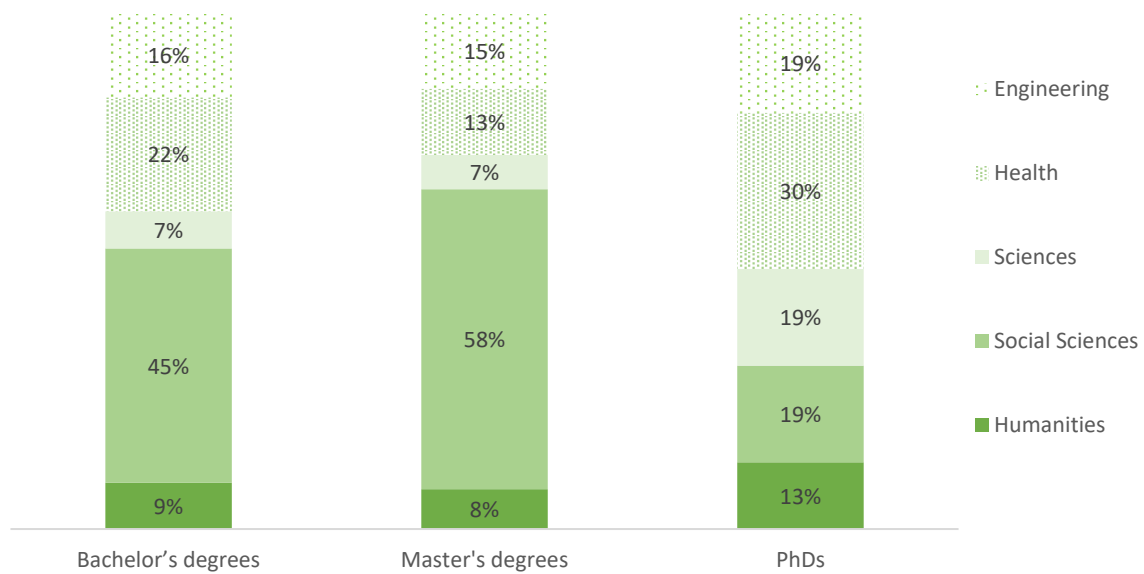
Figure 2. Trend in the percentage of female doctoral graduates of Catalan universities



Source: UNEIX.

> Doctoral theses and educational fields

Figure 3. Graduate distribution by field of knowledge and level of education (academic years 2017-2018 and 2018-2019)

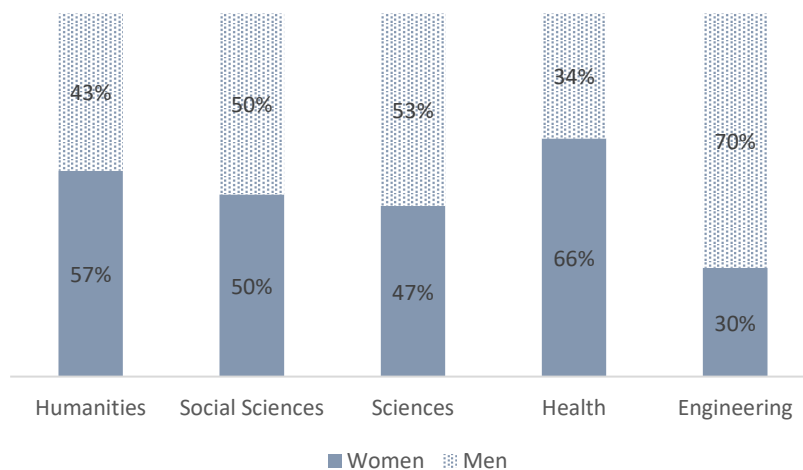


Source: UNEIX.

The distribution of doctoral graduates by field of knowledge is fairly balanced, with a slightly higher proportion of theses in the field of Health

- > Compared with the other levels of education, the proportion of doctoral graduates in Social Sciences has decreased, while the relative figures for Sciences, Health and Humanities have doubled.
- > The proportion of female doctoral graduates is markedly lower in Engineering than in other fields.

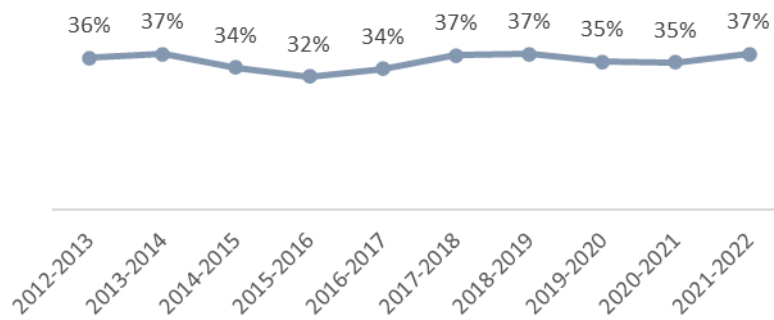
Figure 4. Distribution of doctoral theses defended by field of knowledge and gender (academic year 2018-2019)



Source: UNEIX.

> Talent from Spain and abroad

Figure 5. Trend in the percentage of foreign doctoral graduates in relation to the total



Source: UNEIX.

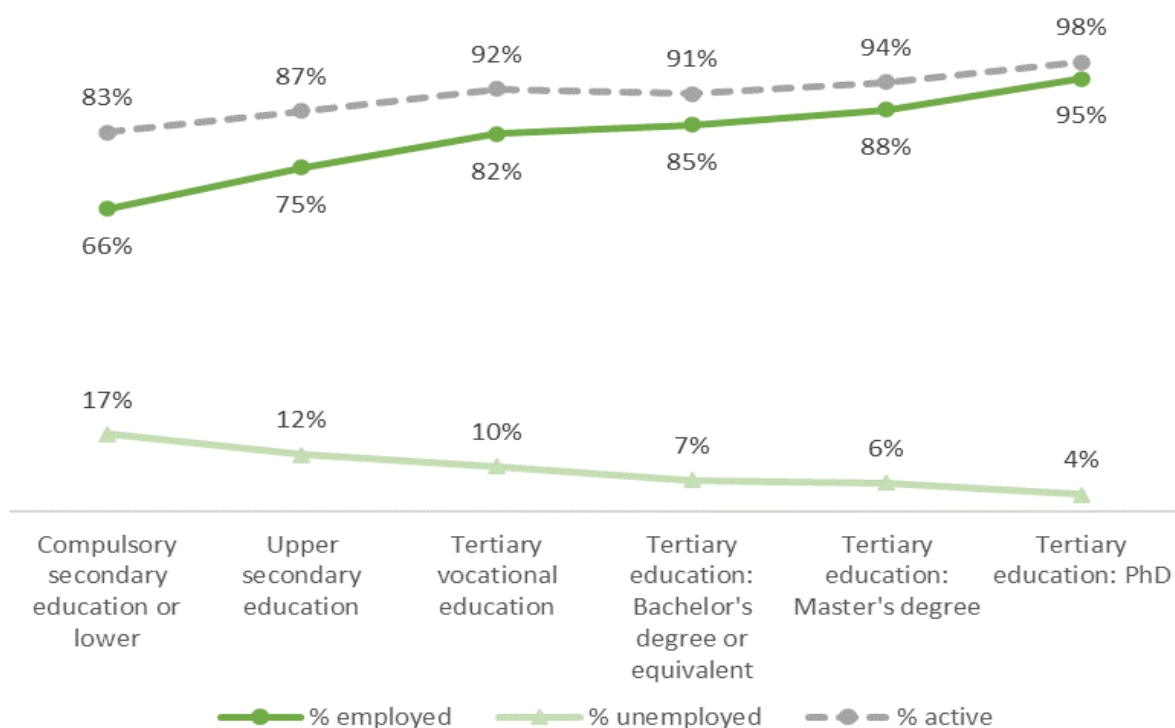
A third of doctoral graduates of Catalan universities are of foreign nationality

- > The proportion of foreign doctoral graduates has remained relatively stable over the last ten years.

ECONOMICALLY ACTIVE POPULATION SURVEY (EAPS, SPAIN)

> Employment outcomes by level of education

Figure 6. Percentage of the active population employed or unemployed by level of education (people aged 25 to 44 – EAPS, 1st quarter 2023)



Note: each indicator is calculated with regard to the total population at each level of education.

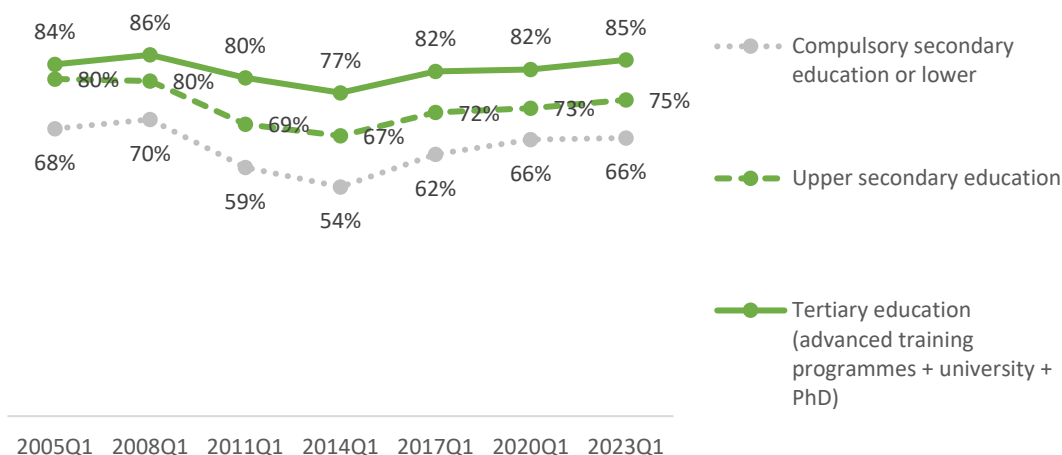
Source: National Statistics Institute (INE).

The higher the education level, the better the employment outcomes

- > Completing tertiary education (vocational or university courses) clearly improves access to the labour market and employment and thus provides better protection against unemployment.
- > By international comparison, Spain had an employment rate of 81% for 25- to 64-year-olds with tertiary education in 2021. This compares with an EU22 average of 87% and an OECD average of 85%. This rate is also far below that of neighbouring countries such as France (86%) and Portugal (90%) (OECD, 2022). The percentages of the same indicator by level of education are as follows:
 - Bachelor's degree or equivalent: Spain 80%, EU22 84%.
 - Master's degree or equivalent: Spain 84%, EU22 89%.
 - PhD or equivalent: Spain 87%, EU22 93%.

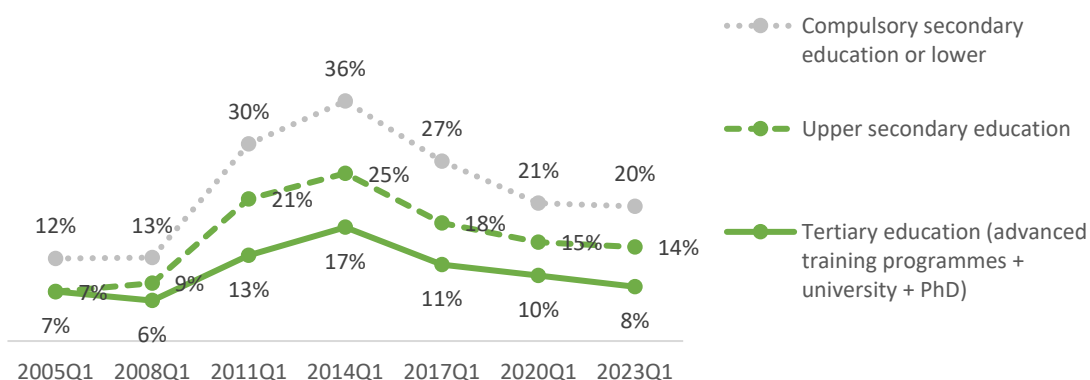
> Employment and unemployment trends

Figure 7. Employment trend by level of education (people aged 25 to 44 – EAPS, 1st quarter 2023)



Source: National Statistics Institute (INE).

Figure 8. Unemployment trend by level of education (people aged 25 to 44 – EAPS, 1st quarter 2023)



Note: the unemployment rate is the number of unemployed as a percentage of the total labour force.

Source: National Statistics Institute (INE).

Over the last three years, the employment rate of people with upper secondary and tertiary education has risen slightly and the corresponding unemployment rate has fallen

- > The employment rate of tertiary educated people is 85% (three percentage points higher than in 2020), while the unemployment rate is 8% (two percentage points lower than in 2020).
- > The distance between unemployment rates by level of education has remained relatively constant since 2020, and is still much wider than the minimal differences observed before the economic crisis. However, the unemployment rate for tertiary educated people has nearly returned to pre-crisis levels.

SURVEY ON EMPLOYMENT OUTCOMES OF DOCTORAL GRADUATES

> Population and sample

Table 1. Population and sample of doctoral graduates in the 2023 employment outcomes survey

2017-2018 and 2018-2019 academic years	Contactable doctoral graduates in the 2023 employment outcomes survey		Sample	
	<i>N</i>	%	<i>n</i>	%
Spanish nationality	2,974	64%	1,871	75%
Foreign nationality	1,686	36%	619	25%
Total	4,662	100%	2,490	100%

Figure 9. Trend in the sample of doctoral graduates by nationality (number of respondents)



Figure 10. Trend in the response rate by nationality

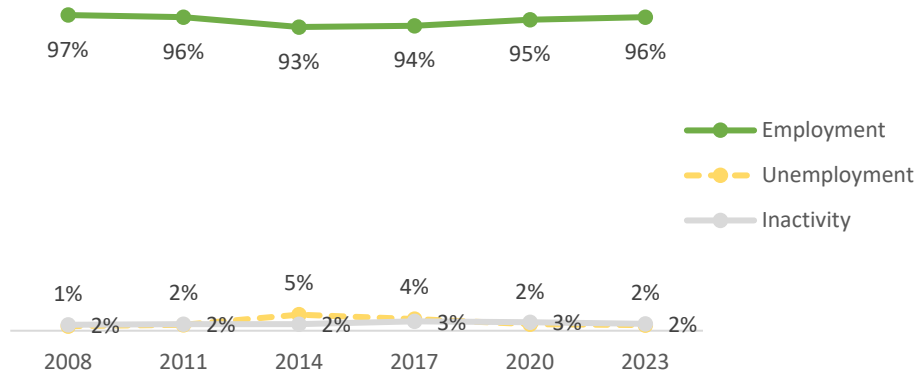


The response rate has increased considerably for both Spanish and foreign doctoral graduates

- > In order to compare the results of 2023 with those of previous surveys, the trends presented in this report focus on Spanish doctoral graduates alone. However, when presenting data for 2023, the total sample is used.
- > At the end of the report there is a section comparing certain indicators between Spanish and foreign doctoral graduates.

> Employment

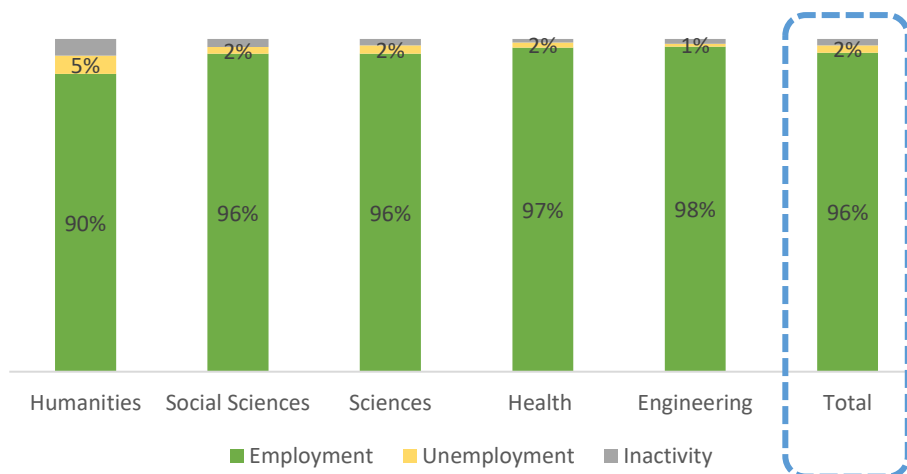
Figure 11. Trend in the employment, unemployment and inactivity rates of doctoral graduates (only those of Spanish nationality)



Ninety-six per cent of Spanish doctoral graduates are employed three years after graduation

- > Although the employment rate of doctoral graduates has always been very high, there has been a steady upward trend since 2014. Importantly, the data show no negative impact of the 2020 health crisis on the employment outcomes of doctoral graduates, as the current employment rate is similar to what it was before the pandemic.
- > There are few differences in employment rates between fields of knowledge, with values ranging from 90% in Humanities to 98% in Engineering.

Figure 12. Employment, unemployment and inactivity rates of doctoral graduates by field of knowledge (2023)

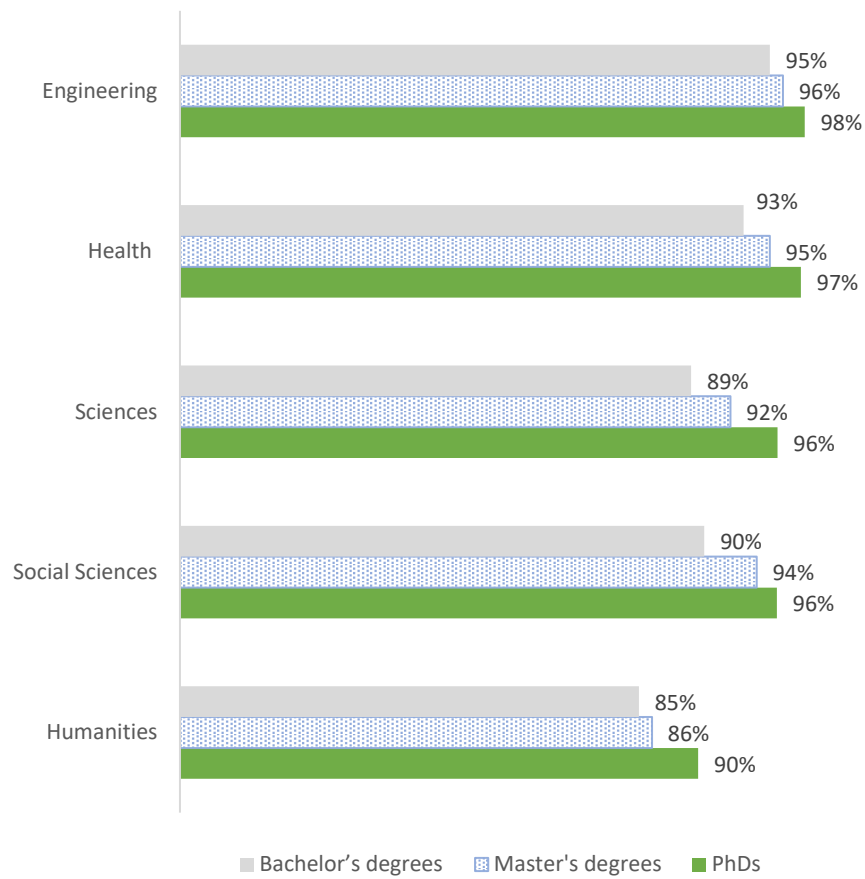


Employment increases along with level of education across all fields of knowledge

- > Data from the 2023 employment outcomes survey show a lower employment rate for bachelor's degree graduates than for graduates of master's degrees and PhDs programmes.

Employment outcomes of doctoral graduates of Catalan universities

Figure 13. Employment rates of bachelor's degree, master's degree and doctoral graduates by field of knowledge (2023)



> Suitability of functions at work

Figure 14. Suitability of functions at work (2023)

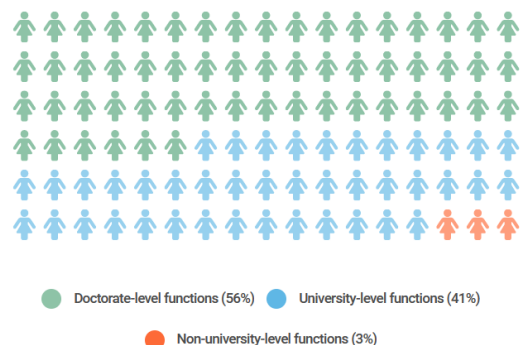
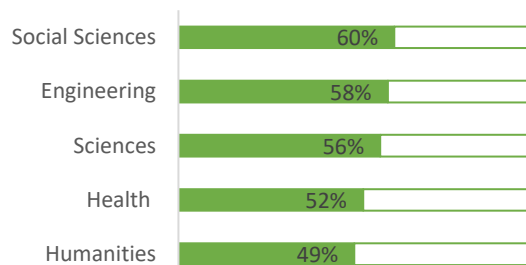


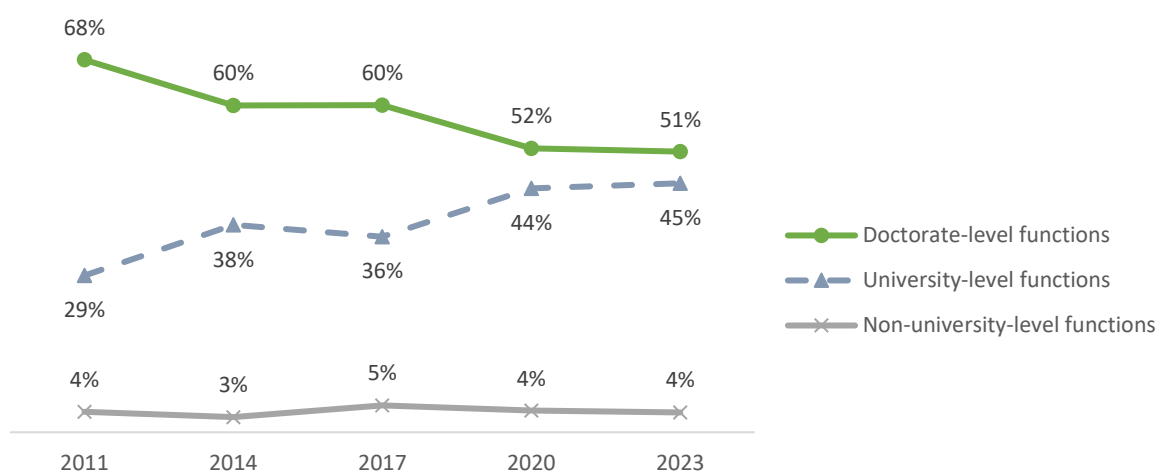
Figure 15. Suitability of functions at work by field of knowledge (2023)



Fifty-six per cent of the doctoral graduates surveyed have jobs that are well suited to their level of education

- > The remaining 44% are overqualified, i.e. the functions they perform are below doctorate level. However, most graduates in this group perform university-level functions (41%) and only a small percentage perform functions below university level (3%).
- > The percentage of doctoral graduates performing doctorate-level functions at work is higher in Social Sciences. Specifically, 60% perform research functions at work, while in Humanities this figure drops to 49%.
- > The overall percentage of doctoral graduates performing doctorate-level functions at work has decreased by 17 points since 2011. In contrast, the percentage of graduates performing university-level functions at work has increased.

Figure 16. Trend in the suitability of functions at work (only doctoral graduates of Spanish nationality)



> Workplace: university, research centre or company

Figure 17. Workplace (2023)

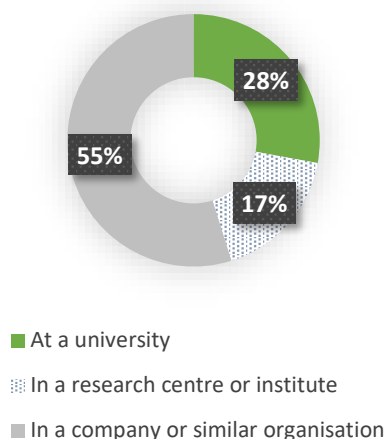
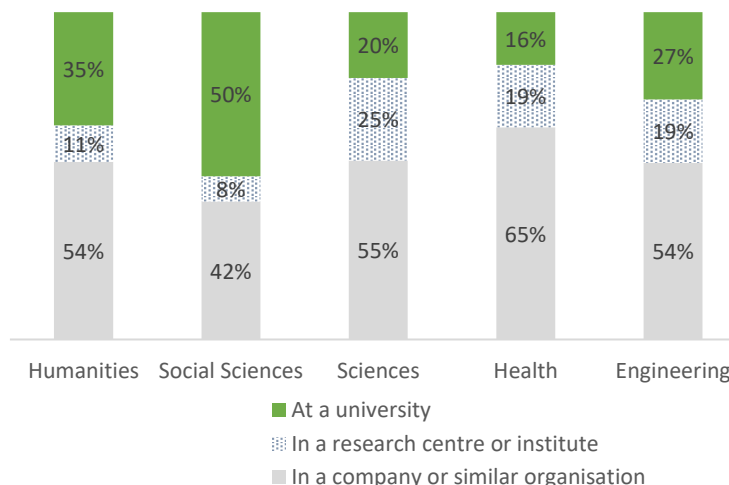


Figure 18. Workplace of doctoral graduates by field of knowledge (2023)



Companies employ more than half of all doctoral graduates

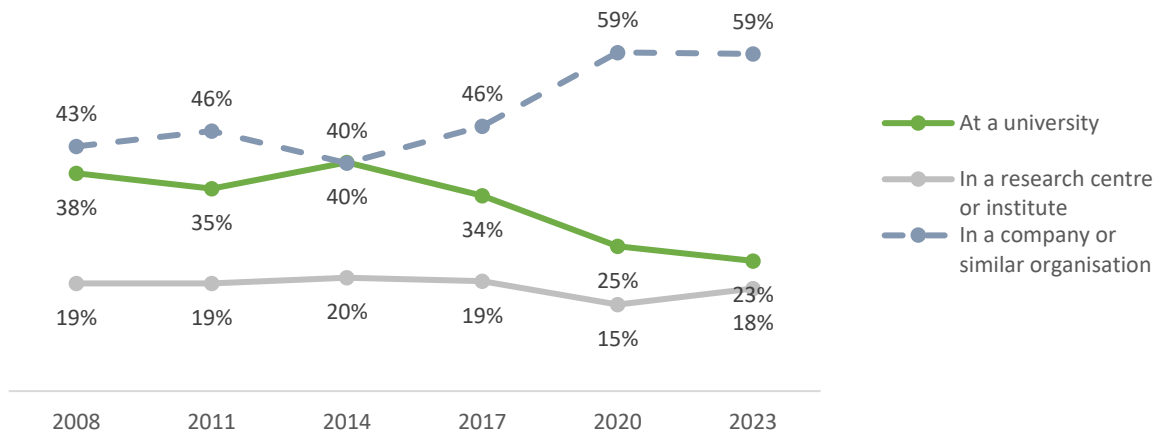
- > According to the 2023 data, 55% of doctoral graduates work in companies or similar organisations, 28% at universities and the remaining 17% at research centres or institutes.
- > The field of Health has the highest percentage of doctoral graduates employed by companies or similar organisations (65%), and they work mainly in health and social care.
- > Doctoral graduates employed by companies work in different sectors according to their field of knowledge. Humanities graduates are mainly employed in education, culture and research. Graduates in Social Sciences are divided between education, culture and research; public administration; and business services. Graduates in Sciences find employment in industry; education, culture and research; health and social care; business services; and public administration. Finally, Engineering graduates work in industry, communication technologies and business services.

Table 2. Economic sector of doctoral graduates employed by companies (2023)

	Humanities	Social Sciences	Sciences	Health	Engineering
Production of raw materials and energy	1%	0%	4%		6%
Industry	2%	2%	27%	10%	30%
Construction		1%	1%		7%
Consumer services	2%	5%	3%	1%	2%
Communication technologies	6%	2%	4%	0%	18%
Information and communication	3%	9%	1%	1%	5%
Financial institutions, insurance, real estate	2%	2%	3%	0%	2%
Business services	3%	10%	13%	2%	11%
Public administration	10%	26%	10%	5%	3%
Education, culture and research	66%	35%	18%	8%	9%
Health and social care	5%	6%	15%	73%	6%

Employment outcomes of doctoral graduates of Catalan universities

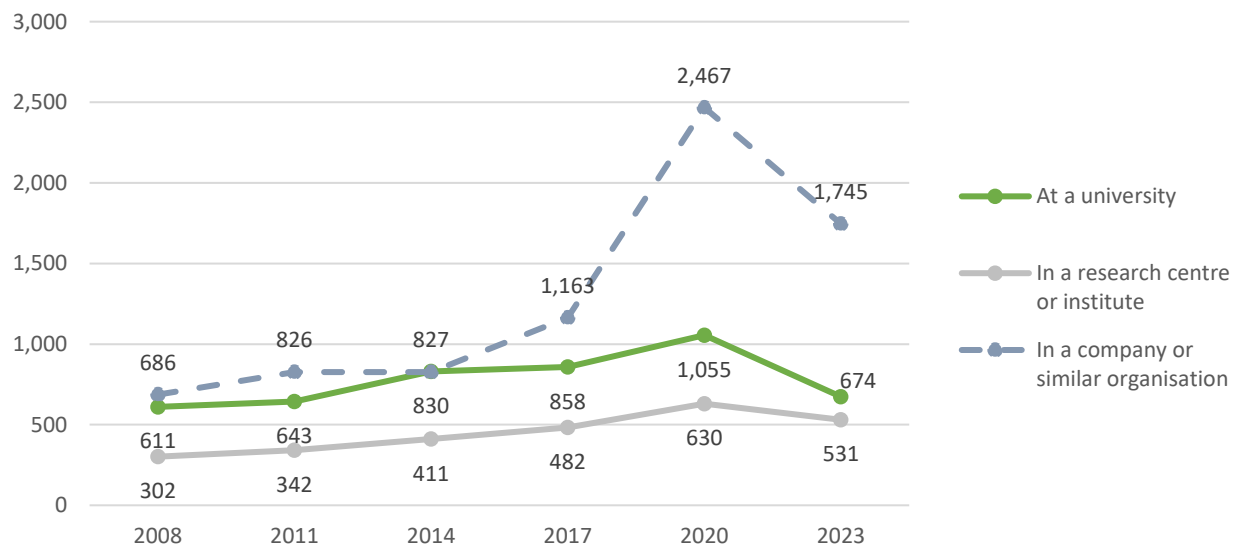
Figure 19. Trend in workplace percentages (only doctoral graduates of Spanish nationality)



Companies show an improved ability to recruit new doctoral graduates

- > Since 2014, the proportion of doctoral graduates employed by companies has increased, while the proportion employed by universities and research centres has decreased.
- > However, the number of doctoral graduates employed at universities and research centres has increased moderately over time, except for a slight decline in 2023.

Figure 20. Trend in workplace numbers (only doctoral graduates of Spanish nationality; absolute value according to the elevation factor)

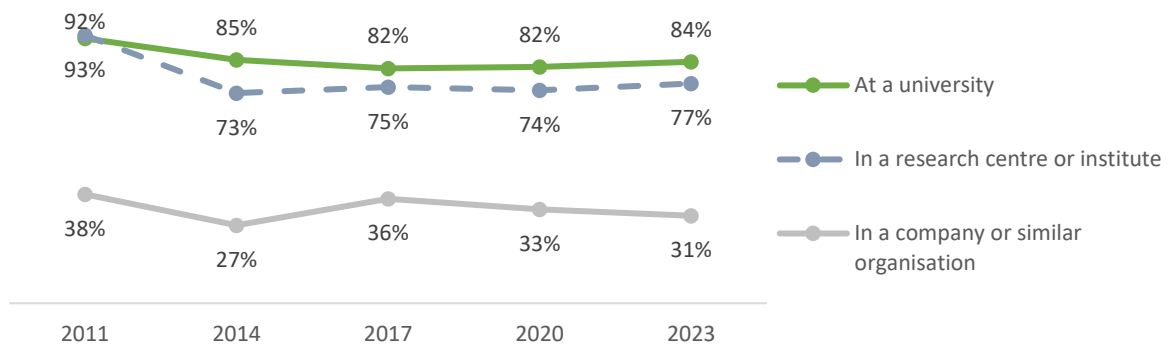


Note: the elevation factor is calculated by dividing the total population by the total sample.

Although most new doctoral graduates work in companies, only one in three does doctorate-level work

- > Most Spanish doctoral graduates employed by universities and research centres perform functions that are well suited to their level of education (84% at universities and 77% at research centres), while at companies only 31% perform doctorate-level functions (five percentage points lower than in 2017).

Figure 21. Trend in the percentage of graduates who perform doctorate-level functions by workplace (only doctoral graduates of Spanish nationality)



> Employment sector: public or private

Figure 22. Employment in the public or private sector (2023)

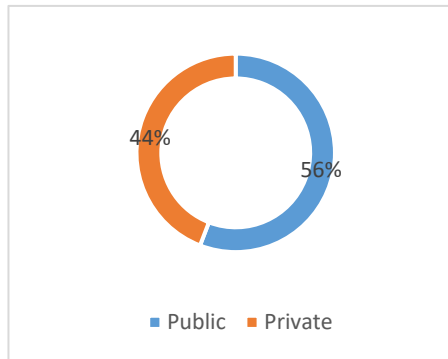
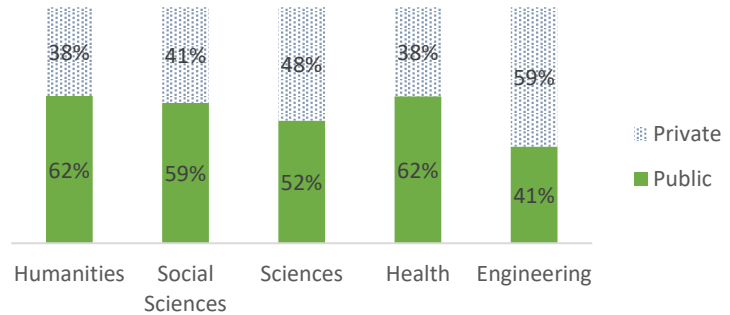


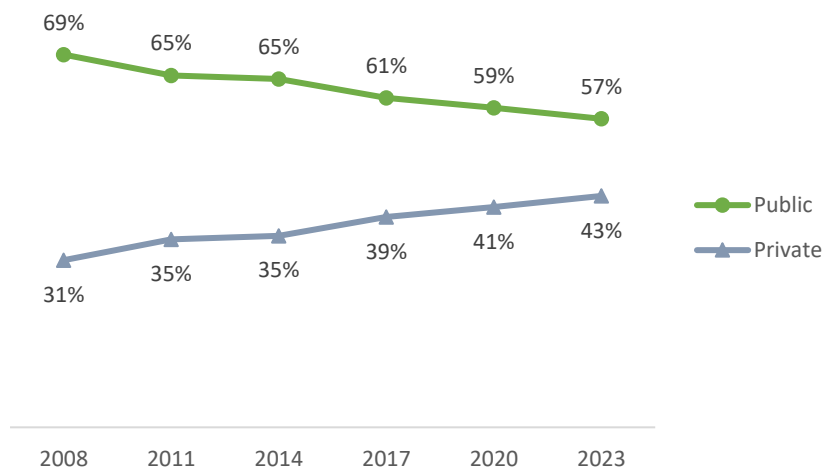
Figure 23. Public or private sector employment among doctoral graduates by field of knowledge (2023)



The public sector still employs more than half of all recent doctoral graduates, but is losing ground

- > The relative importance of the public sector has been trending downwards since the first survey, falling by a total of 12 percentage points.
- > When the data are broken down by field of knowledge, Humanities and Health show the highest proportion of doctoral graduates working in the public sector (62% in both cases). As noted above, doctoral graduates in the fields of Humanities and Health have a significant presence in education and health, respectively, two sectors that are predominantly public services.

Figure 24. Trend in the public or private sector employment of doctoral graduates (only doctoral graduates of Spanish nationality)



> Mobility

Figure 25. Mobility for employment (2023)

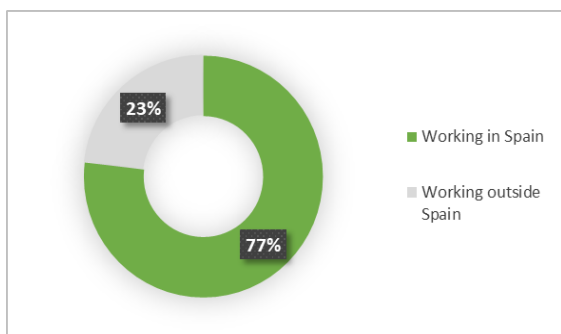
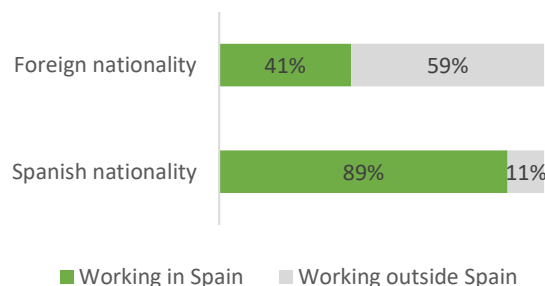


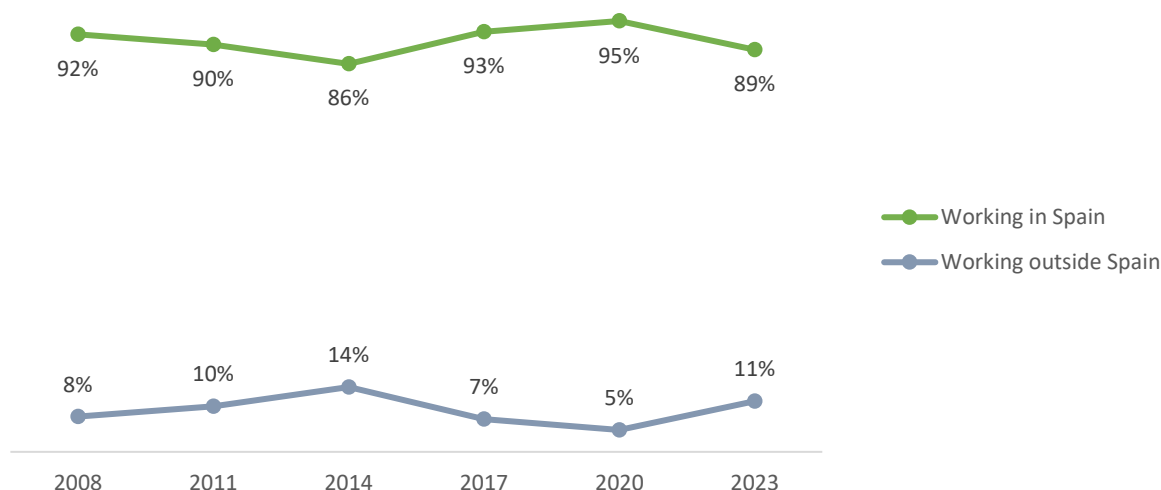
Figure 26. Mobility for employment by nationality (2023)



Almost 1 in 4 doctoral graduates of Catalan universities work abroad. This option tends to be chosen by foreign graduates in particular

- > According to the 2023 data, 23% of doctoral graduates work abroad, although there are significant differences when nationality is taken into account. While 59% of foreign doctoral graduates work abroad, only 11% of their Spanish counterparts have chosen to find employment in another country.
- > While moving abroad for employment purposes is a minority option for Spanish doctoral graduates, the percentage has increased since 2020.
- > Doctoral graduates working outside Spain are mainly employed by universities and research centres. As a result, a higher percentage of them perform functions suited to their level of education compared to those who have found employment in Spain.

Figure 27. Trend in the percentage of doctoral graduates working in Spain and abroad (only those of Spanish nationality)

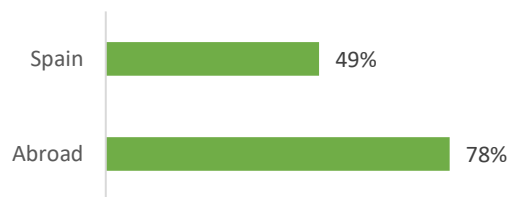


Employment outcomes of doctoral graduates of Catalan universities

Table 3. Percentage of doctoral graduates working in Spain and abroad according to workplace (university, research centre or company) (2023)

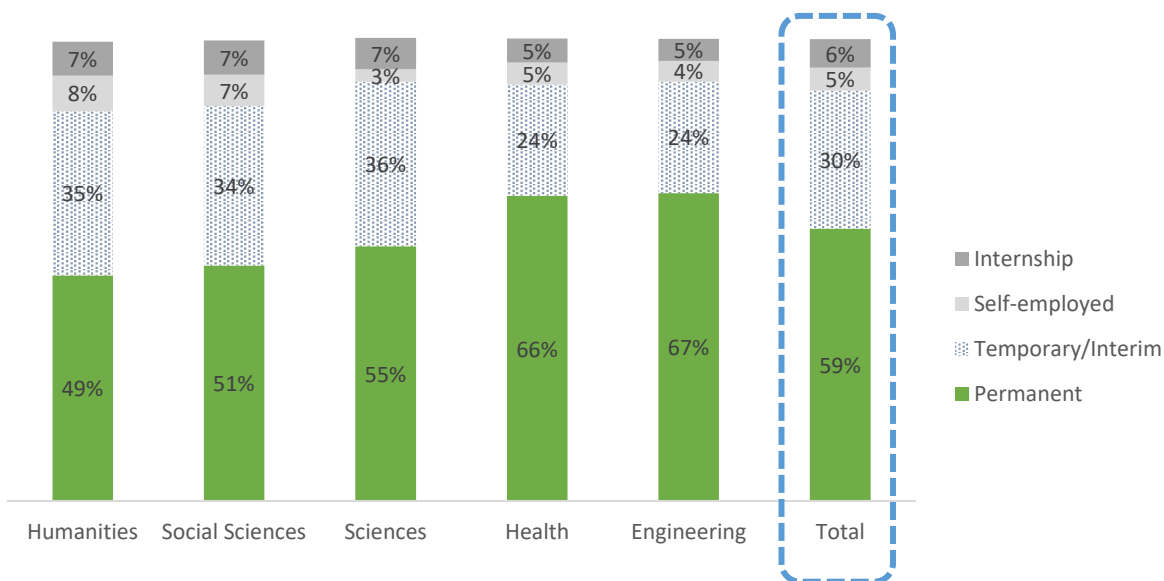
	Working in Spain	Working outside Spain
At a university	22%	46%
In a research centre or institute	16%	23%
In a company or similar organisation	62%	31%
Total	100%	100%

Figure 28. Percentage of doctoral graduates who perform doctorate-level functions according to whether they work in Spain or abroad (2023)



> Contract type

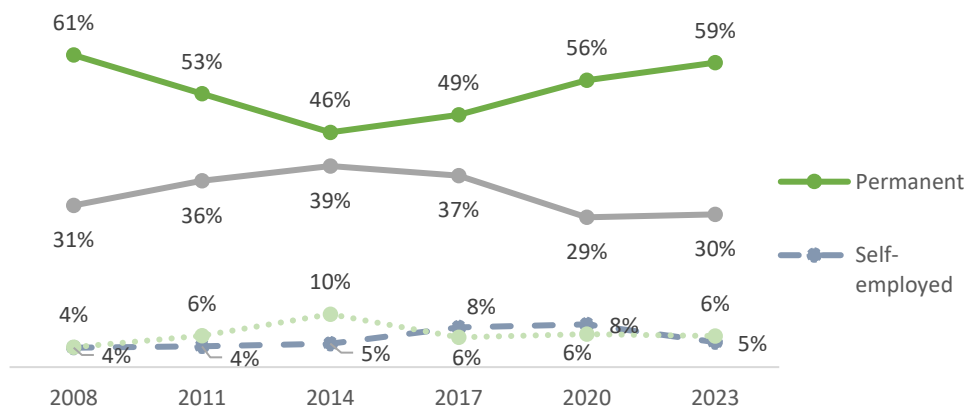
Figure 29. Contract type by educational field (2023)



Most doctoral graduates have a stable job three years after graduation, a trend that has been growing since 2014

- > According to the 2023 data, 6 out of 10 doctoral graduates are on a permanent contract three years after graduation. Health and Engineering offer the greatest job stability, with 66% and 67% of doctoral graduates on permanent contracts respectively.
- > Job stability for Spanish doctoral graduates has increased by 13 percentage points since 2014 (when it was at an all-time low). The relative weight of temporary employment remains at 30%, although it is trending downwards (nine percentage points less than in 2014).
- > The proportion of doctoral graduates who are self-employed has decreased by three points in the last three years (from 8% to 5%).

Figure 30. Trend in contract type (only doctoral graduates of Spanish nationality)



However, job stability is increasing only for doctoral graduates of Spanish nationality working in the private sector

- > There are massive differences in contract type between the public and private sectors. Eight out of ten Spanish doctoral graduates working in the private sector have a stable job (an increase from 71% to 81% since 2020). The same is true for less than half of Spanish doctoral graduates working in the public sector; despite the labour reform of Royal Decree 32/2021, permanent employment has fallen from 45% to 43% since 2020.
- > In 2023, 9% of Spanish doctoral graduates working in the private sector are self-employed. This is nine points less than in 2020.
- > Internship contracts are almost exclusively found in the public sector, where they represent 10% of the Spanish doctoral graduates surveyed in 2023.

Figure 31. Trend in permanent contracts in the public and private sectors

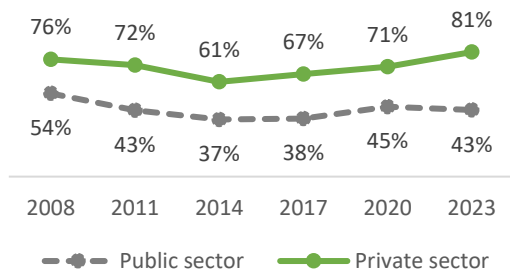


Figure 32. Trend in temporary contracts in the public and private sectors

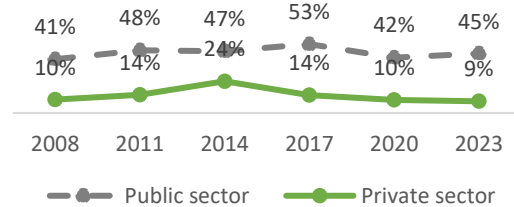


Figure 33. Self-employment trend in the public and private sectors

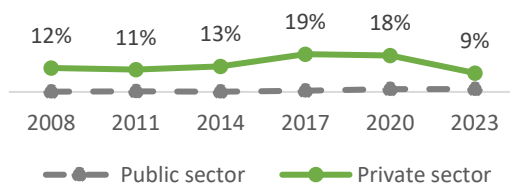


Figure 44. Trend in internship contracts in the public and private sectors

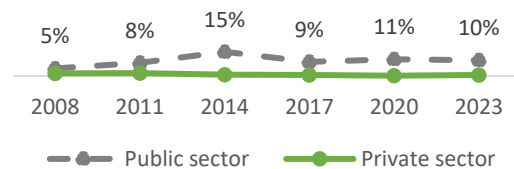
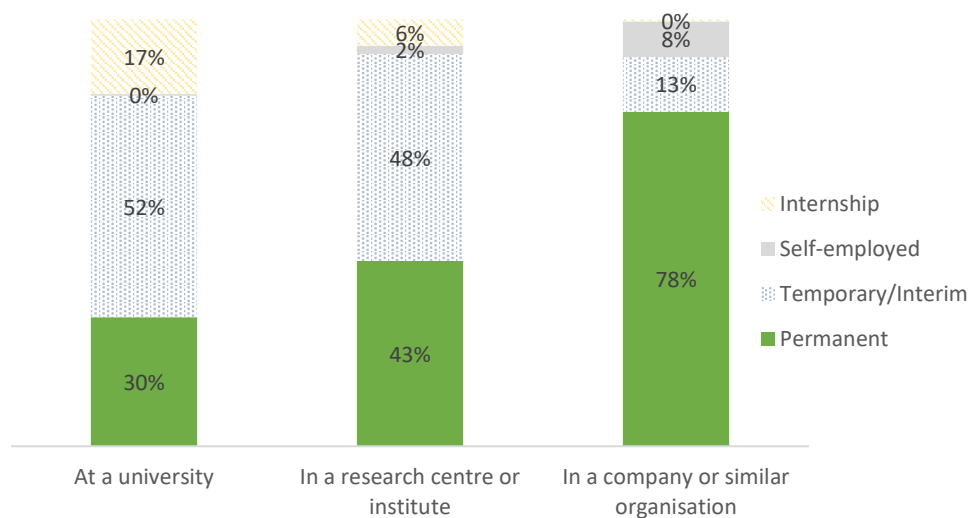


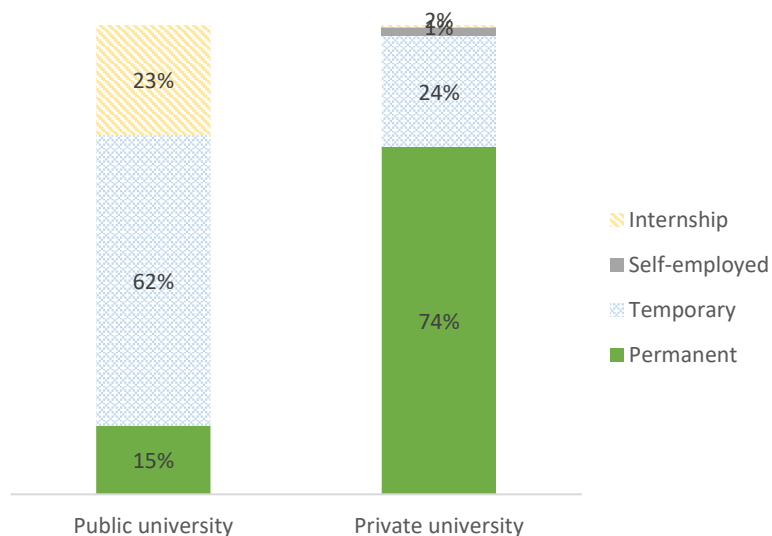
Figure 35. Contract type by workplace (2023)



Most doctoral graduates working at companies or similar organisations benefit from job stability despite not performing doctorate-level functions

- > Seventy-eight per cent of doctoral graduates working at companies are on a permanent contract. This percentage drops to 43% and 30% respectively for those working at research centres and universities.
- > There are significant differences in the type of contract of graduates employed by universities depending on whether the university is public or private. Only 15% of doctoral graduates employed by public universities are on a permanent contract, compared to 74% of their counterparts at private universities.

Figure 36. Contract type of graduates employed at public and private universities (2023)



> Full-time and part-time employment

Figure 37. Full-time and part-time employment (only doctoral graduates of Spanish nationality)

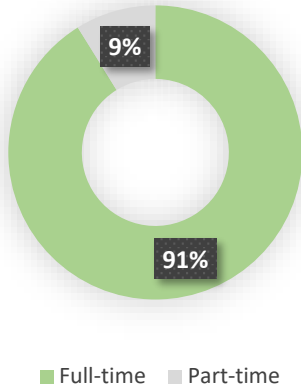
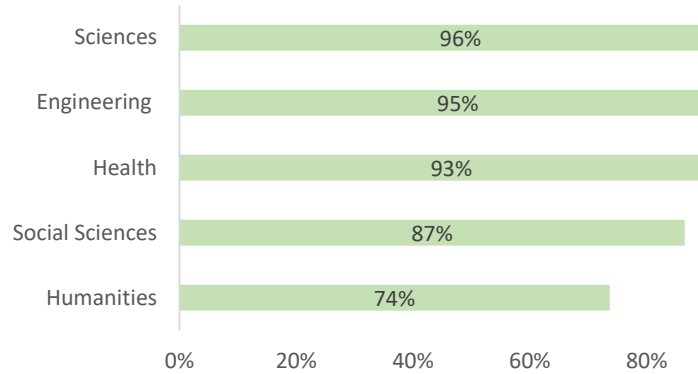


Figure 38. Percentage of doctoral graduates in full-time employment by field of knowledge (2023)



Around 9 out of 10 doctoral graduates have a full-time job

- > There is considerable room for improvement in Humanities, where full-time employment is significantly lower than in the other fields.
- > Although the percentage of Spanish doctoral graduates in full-time employment was trending downwards until 2020, it has risen significantly in 2023 to 91% (an increase of seven percentage points compared to 2020).
- > Universities have a lower percentage of graduates in full-time employment than other workplaces.

Figure 39. Trend in the percentage of doctoral graduates in full-time employment (only those of Spanish nationality)

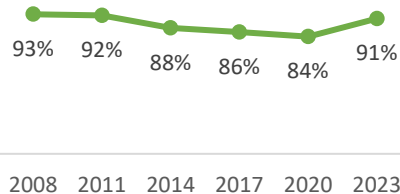
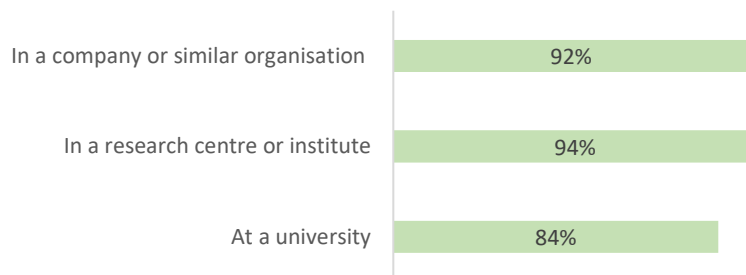
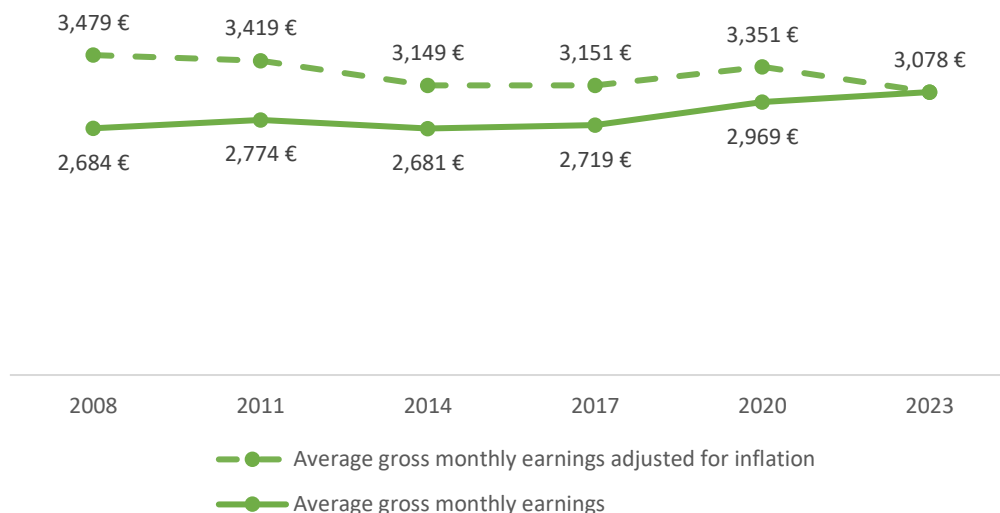


Figure 40. Full-time employment by workplace (2023)



> Salaries

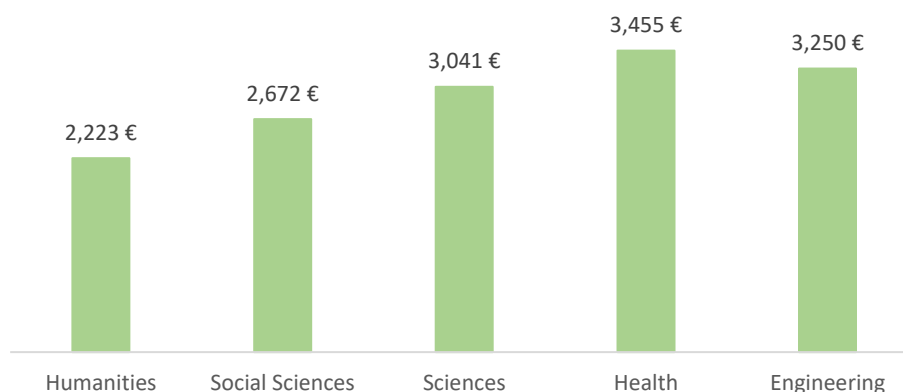
Figure 41. Trend in average gross monthly earnings and equivalised earnings adjusted for inflation¹ (only doctoral graduates of Spanish nationality working full-time in Spain)



Although the salaries of Spanish doctoral graduates have increased over the research period, their purchasing power has decreased

- > The purchasing power of doctoral graduates working full-time in Spain has diminished, especially compared to 2020.
- > The average salary in Humanities is significantly lower than in the other fields. In contrast, Health has the highest average salary.

Figure 42. Average gross monthly earnings by field of knowledge (only those in full-time employment) (2023)

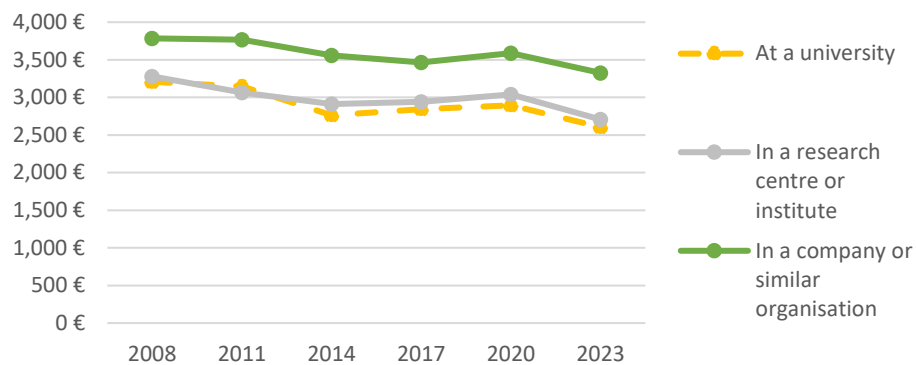


¹ Inflation-adjusted earnings make it possible to compare purchasing power over time by taking account of changes in the average cost of living. Specifically, this report shows equivalised average earnings assuming the cost of living in 2023. To calculate these numbers, we use the Consumer Price Index (CPI) published by the Spanish National Statistics Institute in January of each year analysed (base 2021, consulted in May 2023). For each year x, the following formula is applied: inflation-adjusted earnings = observed earnings / index year x * index year 2023.

Spanish doctoral graduates working at companies have both greater job stability and higher salaries

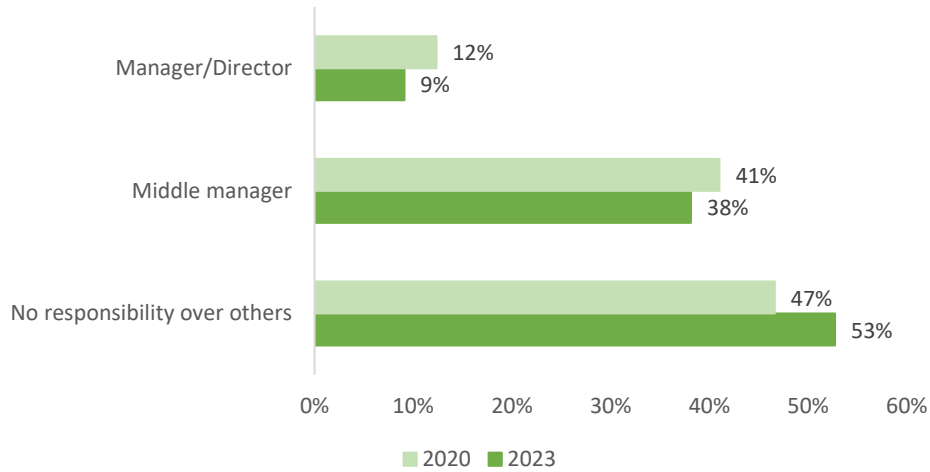
- > Companies offer better salaries than universities or research centres.
- > However, there has been a loss of purchasing power across all workplaces.

Figure 43. Trend in average gross monthly earnings adjusted for inflation¹ (only doctoral graduates of Spanish nationality working full time in Spain)



> Level of responsibility

Figure 44. Trend in doctoral graduates' level of responsibility over others at work

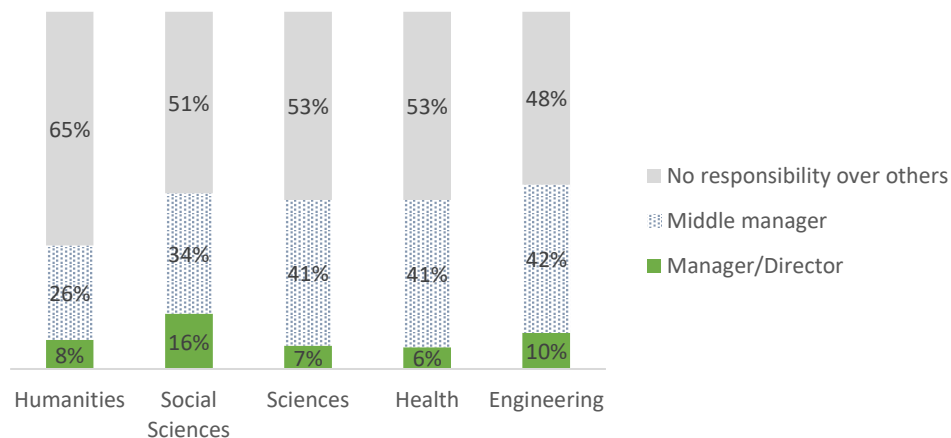


Note: the results of the last two surveys presented in this graph refer to the total sample (i.e. Spanish and foreign doctoral graduates).

About half of all doctoral graduates have responsibility over others at work

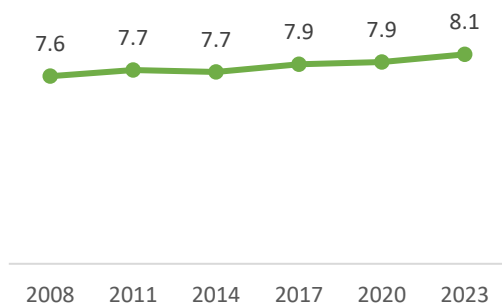
- > According to the 2023 results, 9% are managers or directors, 38% are middle managers and the rest have no responsibility over others. Interestingly, the percentage of doctoral graduates with responsibility over others has slightly decreased since 2020.
- > By field of knowledge, the highest percentage of managers or directors (16%) is found in Social Sciences. Middle managers are most common in Sciences, Health and Engineering (between 41% and 42%). Finally, Humanities has the lowest percentage of doctoral graduates with responsibility over others.

Figure 45. Level of responsibility over others by field of knowledge (2023)



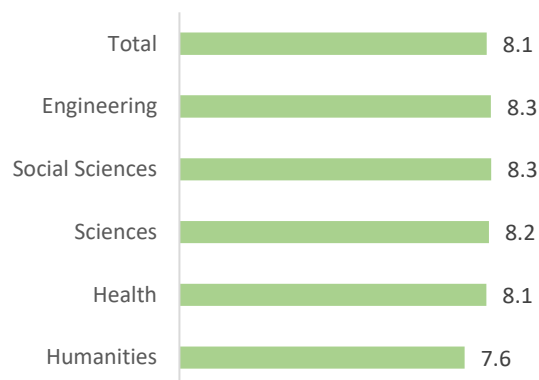
> Job satisfaction

Figure 46. Trend in overall job satisfaction (scale of 0 to 10; only doctoral graduates of Spanish nationality)



Note: responses collected before 2023 were on a scale of 1 to 7 and have been converted to a scale of 0 to 10 for comparison.

Figure 47. Overall job satisfaction by field of knowledge in 2023 (scale of 0 to 10)



Overall job satisfaction among Spanish doctoral graduates has improved over time

- > In 2023, overall job satisfaction is 8.1. There are virtually no differences between fields of knowledge, although the job satisfaction of doctoral graduates in Humanities is slightly lower.
- > There is an upward trend in job satisfaction for all three types of workplace, particularly among those working at companies.

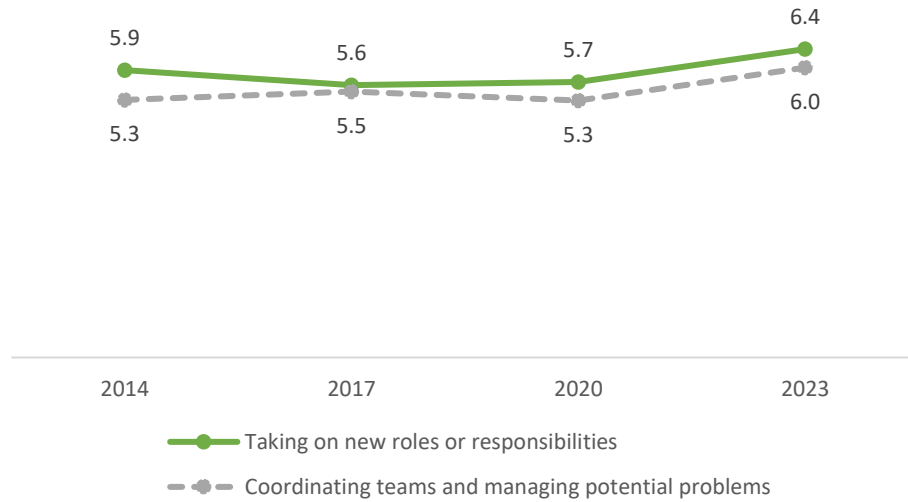
Table 4. Trend in job satisfaction by workplace (scale of 0 to 10; only doctoral graduates of Spanish nationality)

	2008	2011	2014	2017	2020	2023
At a university	7.8	8.0	7.8	8.2	8.0	8.1
In a research centre or institute	7.6	7.8	7.8	7.9	7.8	8.0
In a company or similar organisation	7.4	7.5	7.6	7.9	7.9	8.2

Note: responses collected before 2023 were on a scale of 1 to 7 and have been converted to a scale of 0 to 10 for comparison.

> Impact of the PhD programme on graduates' current job

Figure 48. Trend in the impact of the PhD programme on graduates' current job (scale of 0 to 10; only doctoral graduates of Spanish nationality)

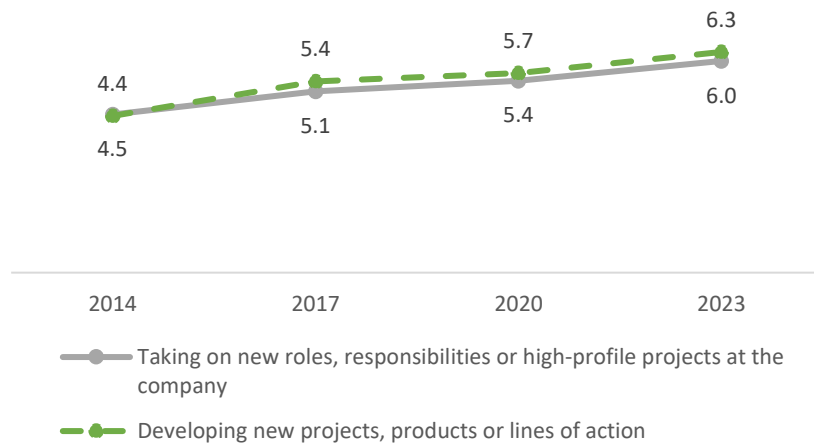


Note: only doctoral graduates who worked for at least two years during their PhD programme were able to respond. Responses collected before 2023 were on a scale of 1 to 7 and have been converted to a scale of 0 to 10 for comparison.

PhD programmes had a modest impact on the jobs of graduates who worked while studying

- > According to the 2023 survey results, PhD programmes had an impact of 6.4 and 6, respectively, on taking on new roles or responsibilities and coordinating teams and managing problems. However, these scores have improved since 2020.
- > For doctoral graduates working at companies, PhD programmes have an increasing impact on taking on new roles, responsibilities or high-profile projects, and developing new projects or products.

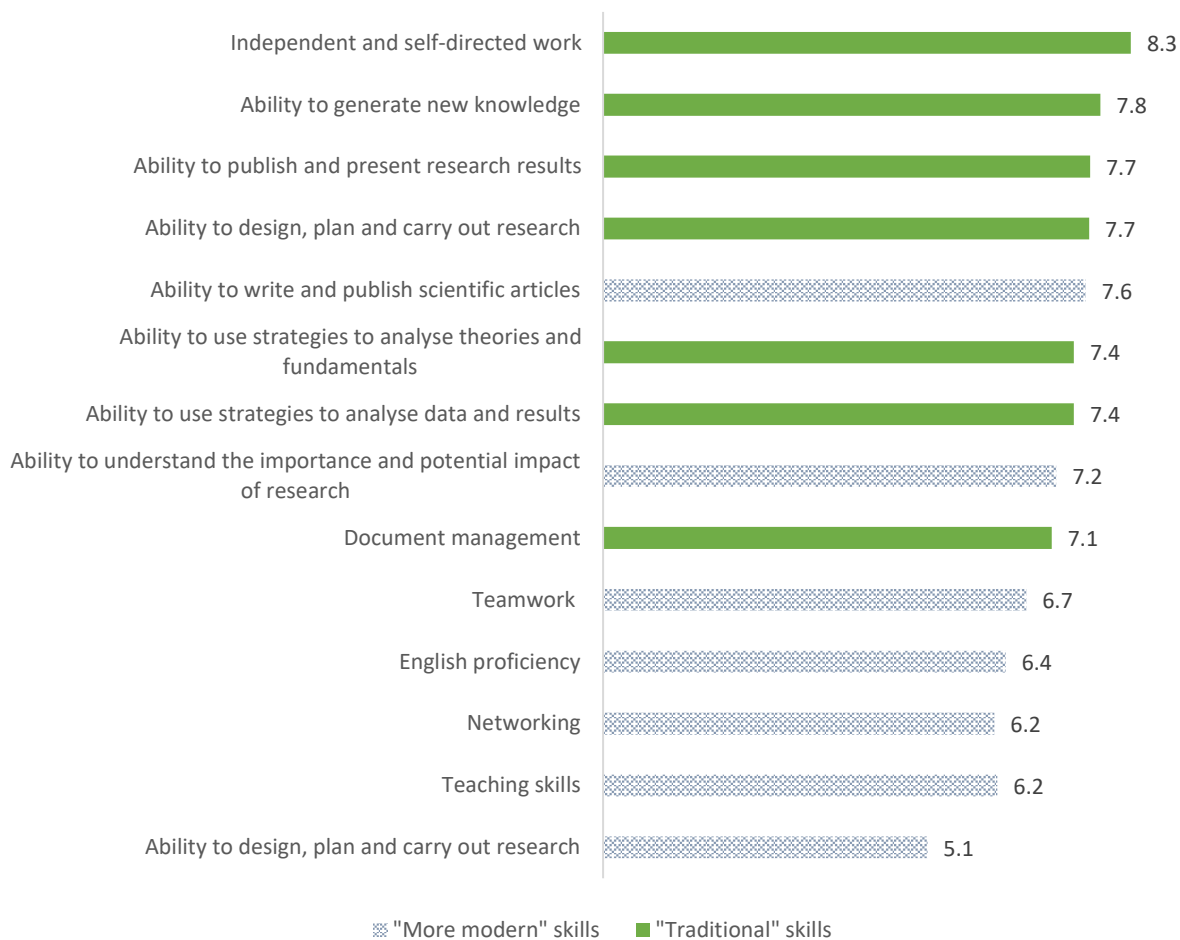
Figure 49. Trend in the impact of the PhD programme on graduates' current job (scale of 0 to 10; only doctoral graduates of Spanish nationality working at companies)



Note: only doctoral graduates who worked for at least two years during their PhD programme and are employed at a company were able to respond. Responses collected before 2023 were on a scale of 1 to 7 and have been converted to a scale of 0 to 10 for comparison.

> Skills acquisition

Figure 50. Skills acquisition in 2023 (scale of 0 to 10)²



Doctoral graduates best acquire the "traditional" skills of a researcher during their studies

- > The acquisition of skills more directly related to writing a doctoral thesis, such as independent and self-directed work, the ability to generate new knowledge, the ability to publish and present results, the ability to use strategies to analyse theory or data, and document management, is considerably high (7.1 or above).
- > Meanwhile, the acquisition of "more modern" skills is much lower overall, suggesting that PhD programmes should improve in this respect. These skills include the ability to write and publish scientific articles (7.6) and the ability to understand the importance and potential impact of research (7.2). The ability to seek funding and manage resources for research has the lowest acquisition score (5.1).

²This list of skills is based on sources that identify the attributes expected of doctoral graduates: the Joint Quality Initiative's Dublin Descriptors (2004), the Irish Universities Association (2008), Vitae (2010) and LERU (2010).

Table 5. Skills acquisition in 2023 by field of knowledge (scale of 0 to 10)

	Humanities	Social Sciences	Sciences	Health	Engineering
Document management	7.4	7.4	7.0	6.8	7.2
Ability to use strategies to analyse theories and fundamentals	7.7	7.7	7.4	7.1	7.9
Ability to use strategies to analyse data and results	6.9	7.3	7.8	7.2	7.9
Ability to publish and present research results	7.4	7.6	7.9	7.4	8.1
Ability to write and publish scientific articles	7.1	7.5	7.8	7.3	8.3
Ability to design, plan and carry out research	7.6	7.9	7.7	7.5	7.7
Ability to generate new knowledge	7.9	8.1	7.8	7.5	8.2
Independent and self-directed work	8.6	8.6	8.3	7.9	8.6
Networking	5.6	6.3	6.3	6.1	6.4
Ability to understand the importance and potential impact of research	6.8	7.5	6.9	7.2	7.1
Ability to seek funding and manage resources for research	4.8	5.1	5.2	5.1	5.3
Teaching skills	6.4	6.5	6.1	6.1	6.1
English proficiency	5.3	5.8	7.2	6.0	7.3
Teamwork	5.6	6.2	7.2	7.0	6.7

Skills acquisition is higher overall in Sciences and Engineering

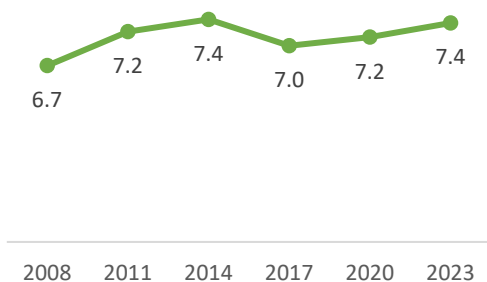
- > PhD programmes in Sciences and Engineering allow for a better acquisition of both "traditional" skills (ability to use strategies to analyse theories and fundamentals, ability to use strategies to analyse data and results, ability to publish and present research results) and "more modern" skills (ability to write and publish scientific articles, teamwork, networking, English proficiency).
- > Compared to 2020, the survey respondents reported a higher acquisition of all skills. English proficiency and document management show the greatest improvement since 2020. Teaching received almost the same score as in the previous survey.

Figure 51. Increase in skills acquisition compared to 2020 (scale of 0 to 10)



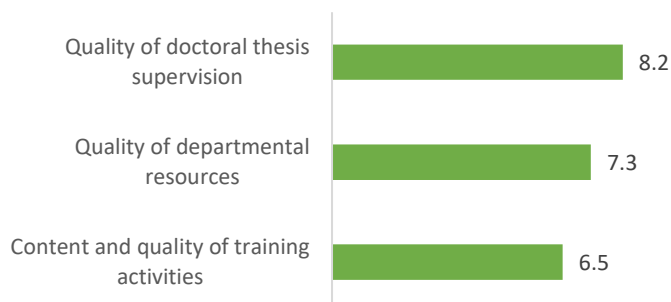
> Graduates' satisfaction with their PhD programme

Figure 52. Trend in graduates' overall satisfaction with their PhD programme (scale of 0 to 10; only doctoral graduates of Spanish nationality)



Note: responses collected before 2023 were on a scale of 1 to 7 and have been converted to a scale of 0 to 10 for comparison.

Figure 53. Graduates' satisfaction with certain aspects of their PhD programme in 2023 (scale of 0 to 10)



The quality of doctoral thesis supervision is the most highly rated aspect of PhD programmes across all fields of knowledge

- > The average satisfaction of doctoral graduates with this aspect is 8.2. Satisfaction with the quality of departmental resources is 7.3 and satisfaction with the content and quality of training activities is 6.5.
- > Graduates' overall satisfaction with their PhD programme has increased in recent years to 7.4.
- > Satisfaction with the quality of doctoral thesis supervision is high in all fields of knowledge, particularly in Humanities and Social Sciences. Meanwhile, graduates are least satisfied with the content and quality of training activities, especially in Sciences and Health.

Table 6. Graduates' satisfaction with certain aspects of their PhD programme by field of knowledge (2023)

	Humanities	Social Sciences	Sciences	Health	Engineering
Content and quality of training activities	6.8	7.1	6.1	6.1	6.8
Quality of doctoral thesis supervision	8.4	8.7	8.0	8.0	8.2
Quality of departmental resources and availability to conduct research	7.0	7.2	7.6	7.2	7.7
Overall satisfaction with the PhD programme	7.4	7.8	7.6	7.3	7.8

> Would graduates choose the same PhD programme again

Figure 54. Trend in the percentage of doctoral graduates who would choose the same PhD programme again (only doctoral graduates of Spanish nationality)

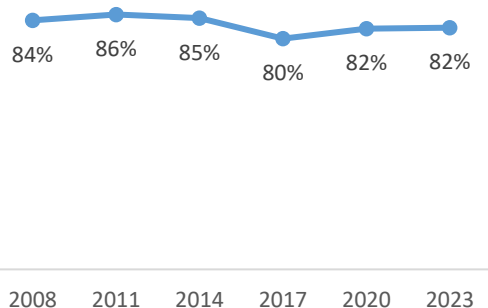


Figure 55. Percentage of doctoral graduates who would choose the same PhD programme again by field of knowledge (2023)

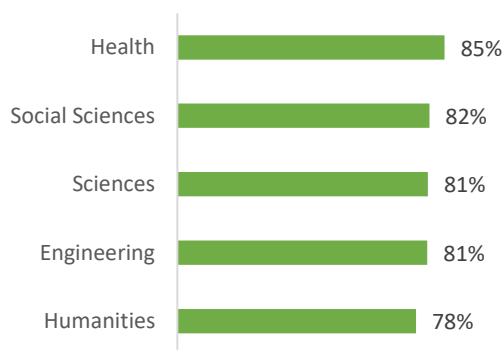
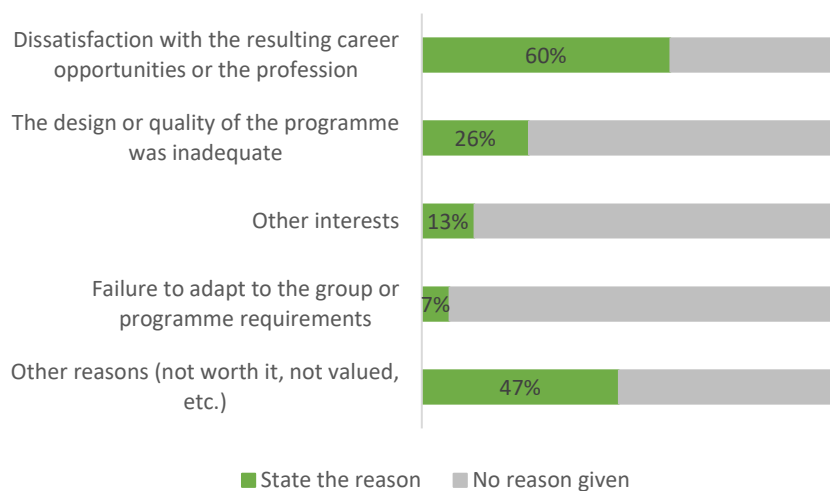


Figure 56. Reasons why graduates would not choose the same PhD programme again (respondents could check more than one response; 2023)



Eighty-two per cent of Spanish doctoral graduates would choose the same PhD programme again

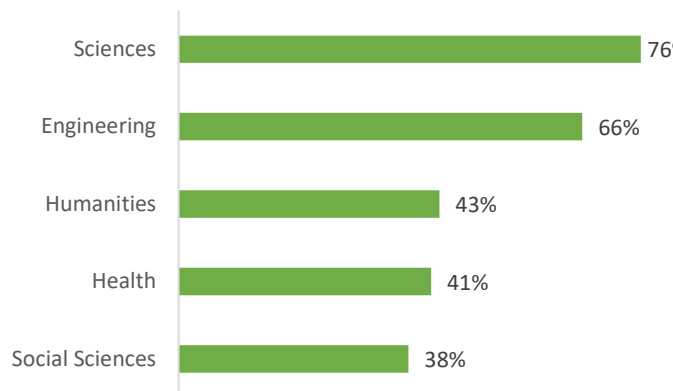
- > This indicator has remained stable over the period analysed (between 80% and 86%).
- > There are no major differences between fields of knowledge in terms of whether graduates would choose the same PhD programme again. The highest percentage is in Health (85%) and the lowest is in Humanities (78%).
- > Graduates' main reason for not choosing to take the same PhD programme again is dissatisfaction with the resulting career opportunities. In the "other reasons" category, some graduates said that the PhD programme was not worth it or is not valued. Others cited mental health problems suffered during their studies due to job insecurity and the difficulty of writing a doctoral thesis.

> Source of livelihood during the PhD programme

Table 7. How graduates earned a livelihood during their PhD programme (2023)

Source of livelihood	Percentage
A grant	52%
Employment in a field related to the graduate's pre-doctoral studies	24%
University lecturer/researcher	12%
Employment in a field unrelated to the graduate's pre-doctoral studies	9%
Another source not involving work	4%

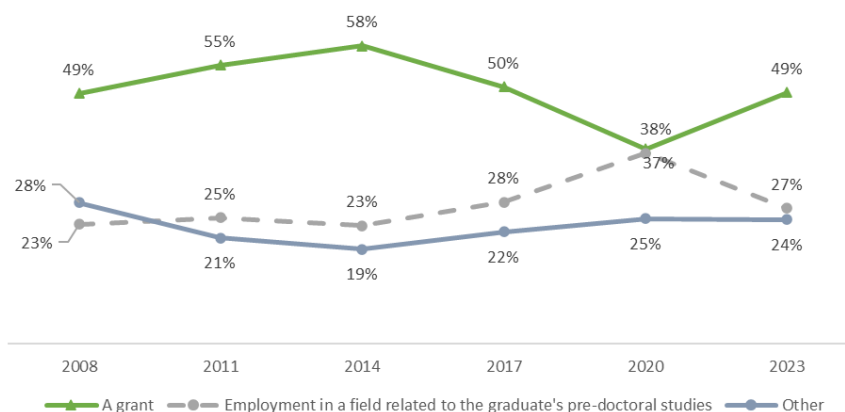
Figure 57. Percentage of doctoral graduates with a grant by field of knowledge (2023)



Half of Spanish doctoral graduates had a grant (or research training contract) as a source of livelihood to pursue their PhD

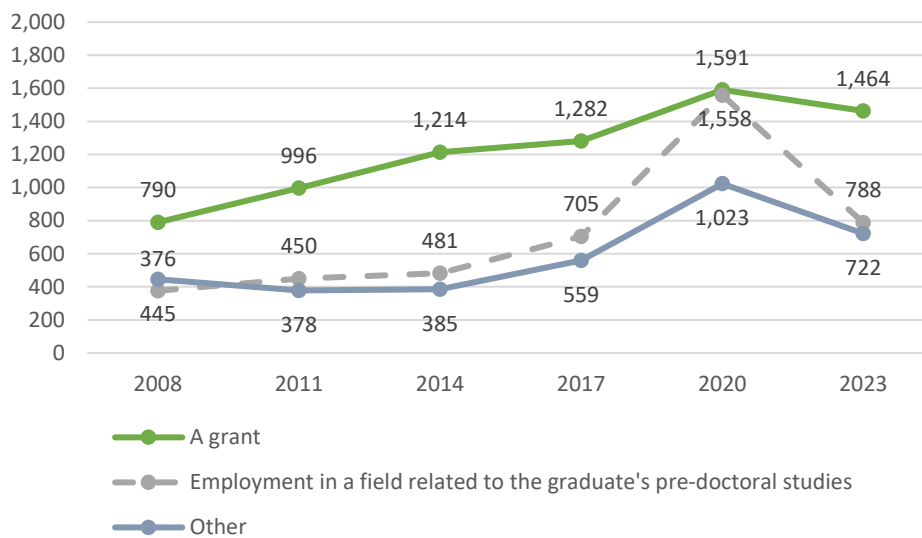
- > Of the doctoral graduates surveyed in 2023, 52% paid for their studies with a grant, 24% with a job in a field related to their pre-doctoral studies, and the rest in other ways (university lecturing or research, unrelated work or other means not involving work).
- > The percentage of graduates with a grant varies greatly across fields of knowledge, from 76% in Sciences to 38% in Social Sciences.
- > The percentage of doctoral graduates with a doctoral thesis grant has improved by 11 percentage points since 2020 (from 38% to 49%). It is worth noting that the percentage of doctoral graduates with a grant had decreased by 20 points between 2014 and 2020 (from 58% to 38%). There was no reduction in the number of people receiving grants, however, but rather a large number of doctoral students from old PhD programmes (mostly taken without grants) that had accumulated in the system and were awarded their degrees in the 2015-2016 and 2016-2017 academic years. In fact, the trend in the number of doctoral graduates with grants has been positive over time.

Figure 58. Trend in graduates' source of livelihood during their PhD programme (only doctoral graduates of Spanish nationality)



Employment outcomes of doctoral graduates of Catalan universities

Figure 59. Trend in graduates' source of livelihood during their PhD programme (only doctoral graduates of Spanish nationality; absolute value according to the elevation factor)



Note: the elevation factor is calculated by dividing the total population by the total sample.

> How graduates undertook their PhD programme: independently or as part of a research group

Figure 60. How graduates did their thesis (2023)

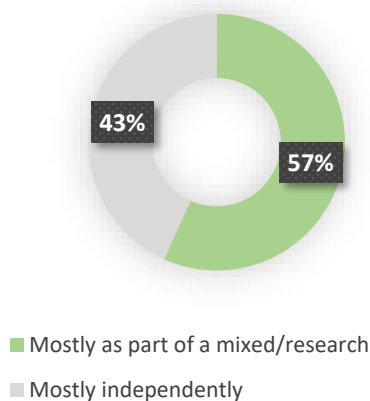
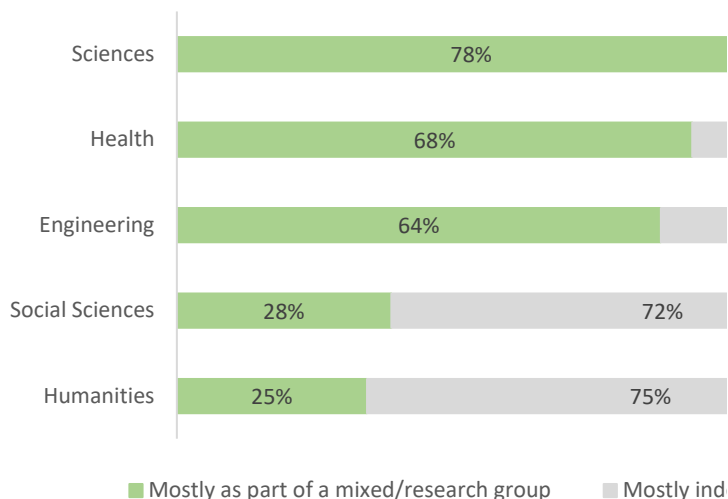


Figure 61. Percentage of graduates who did their thesis independently or as part of a research group by field of knowledge (2023)



Nearly 6 out of 10 Spanish doctoral graduates did their thesis as part of a research group

- > The percentages vary considerably by field of knowledge. While most doctoral graduates in Sciences, Health and Engineering were part of a research group (78%, 68% and 64% respectively), the opposite was true in Social Sciences and Humanities (28% and 25% respectively).
- > After a significant decline in recent years in the percentage of theses carried out as part of a research group (from 71% in 2014 to 55% in 2020), the data for 2023 show some improvement (reaching 61%). It should be noted, however, that the decline in 2020 was partly due to the large number of doctoral students from old PhD programmes (mostly taken independently) that had accumulated in the system and were awarded their degrees in the 2015-2016 and 2016-2017 academic years.

Employment outcomes of doctoral graduates of Catalan universities

Figure 62. Trend in the way graduates did their thesis (only doctoral graduates of Spanish nationality)

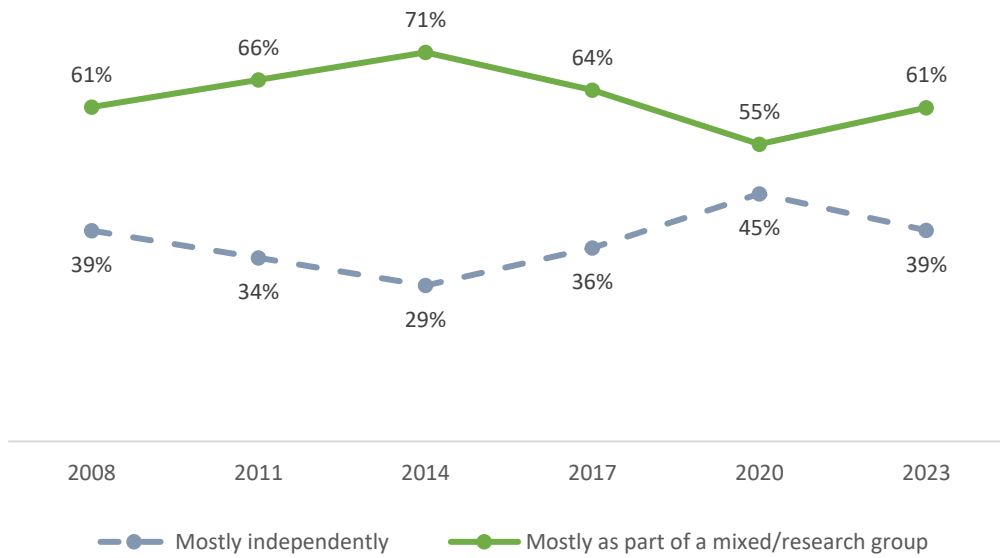
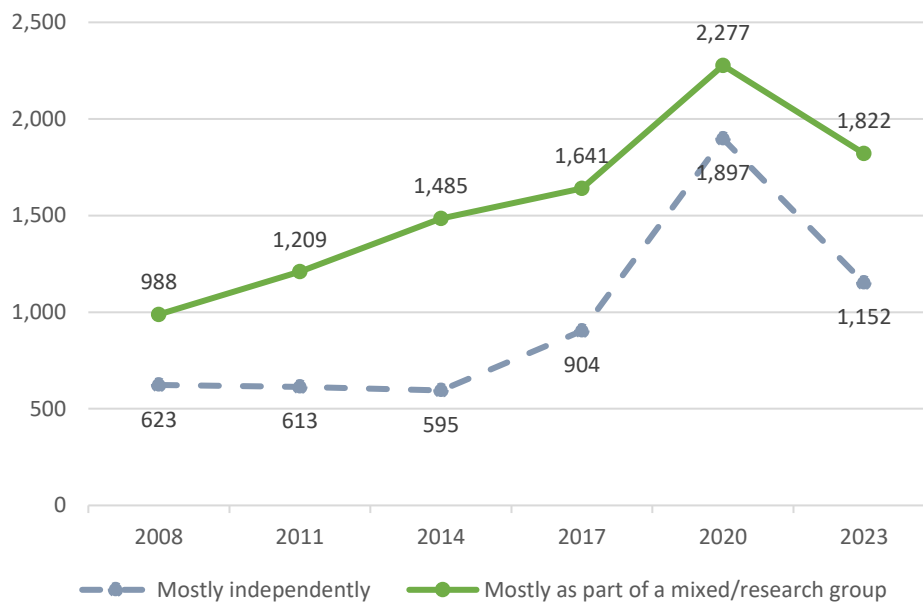


Figure 63. Trend in the number of doctoral graduates according to the way in which they did their thesis (only doctoral graduates of Spanish nationality; absolute value according to the elevation factor)



Note: the elevation factor is calculated by dividing the total population by the total sample.

Doctoral graduates who did their thesis as part of a research group reported higher levels of acquisition of most skills

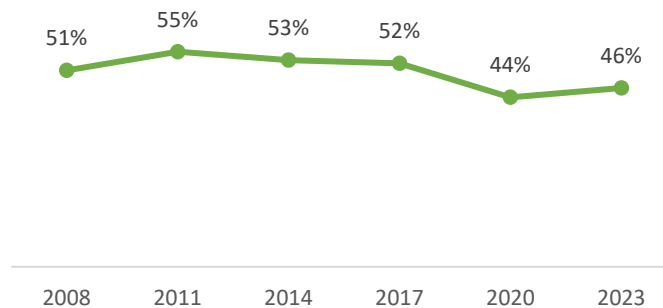
- > Doctoral graduates who did their thesis as part of a research group reported higher levels of acquisition of most skills, with the exception of independent and self-directed work and document management, compared to those who did their thesis independently.
- > The largest differences are found in the acquisition of teamwork (1.7-point difference), English proficiency (1.1) and the ability to seek funding and manage resources for research (0.7).

Figure 64. Skills acquisition in 2023 according to how graduates did their thesis (scale of 0 to 10)



> Doctoral graduates' mobility during their PhD programme

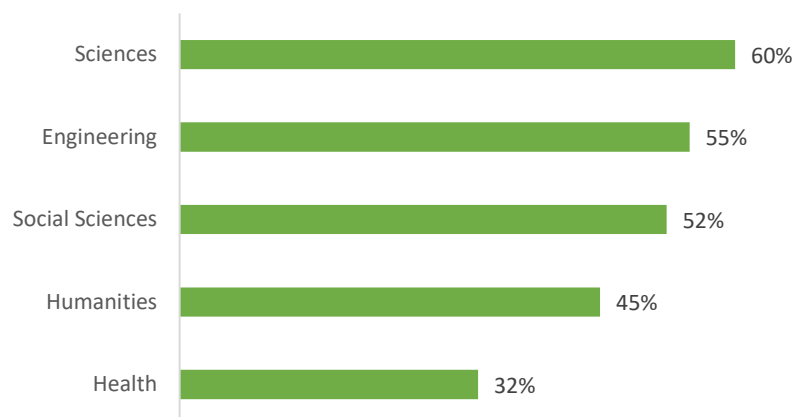
Figure 65. Trend in national or international mobility during PhD programmes (only doctoral graduates of Spanish nationality)



Nearly half of all Spanish doctoral graduates had mobility experiences while pursuing their PhD

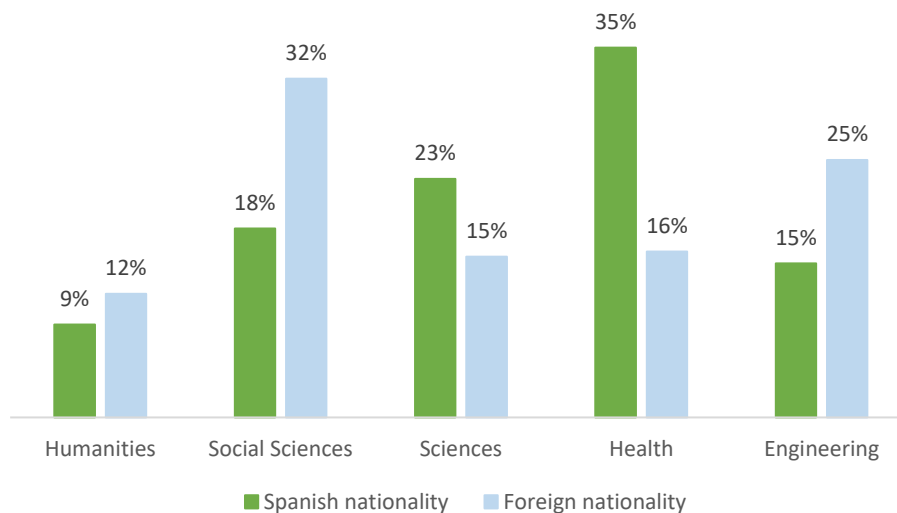
- > After a downward trend of 11 percentage points between 2011 and 2020 (from 55% to 44%), there is a slight increase in 2023 (to 46%).
- > The percentage of doctoral graduates who had mobility experiences varies greatly between fields of knowledge, ranging from 60% in Sciences to 32% in Health.

Figure 66. Mobility during PhD programmes by field of knowledge (2023)



> Comparison of Spanish and foreign graduates of PhD programmes in Catalonia (2023)

Figure 67. Distribution of doctoral graduates by field of knowledge and nationality (2023)



Forty per cent of foreign doctoral graduates are from Latin America. Social Sciences and Engineering attract the highest proportion of foreign students

- > The distribution of doctoral graduates by field of knowledge differs significantly when nationality is taken into account. Spanish graduates are concentrated in Health and Sciences, while foreign graduates are mainly in Social Sciences and Engineering.
- > Sixty-one per cent of foreign doctoral graduates paid for their PhD programme with a grant, and most did their doctoral thesis mostly independently. This contrasts with Spanish graduates: 49% received a grant and more than half did their thesis as part of a research group.

Employment outcomes of doctoral graduates of Catalan universities

Figure 68. Percentage of doctoral graduates who paid for their PhD programme with a grant by nationality (2023)

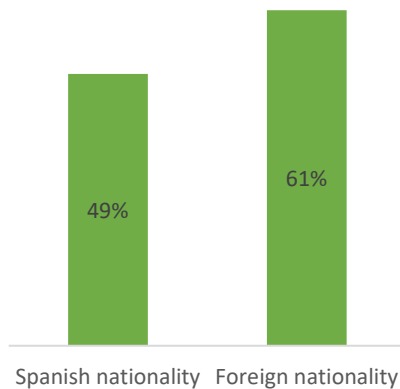


Figure 69. How graduates did their thesis by nationality (2023)

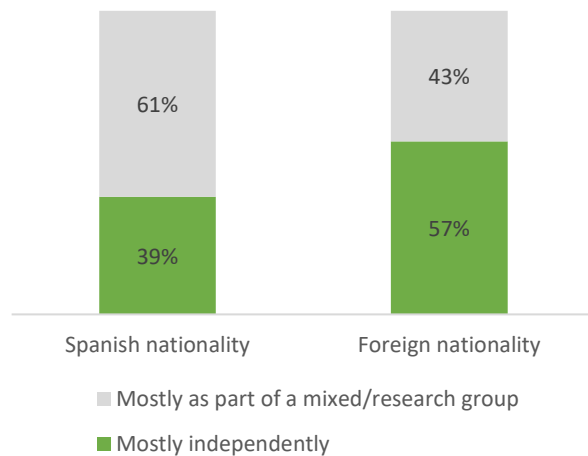


Table 8. Percentage of doctoral graduates who are employed and those working in Spain by nationality (2023)

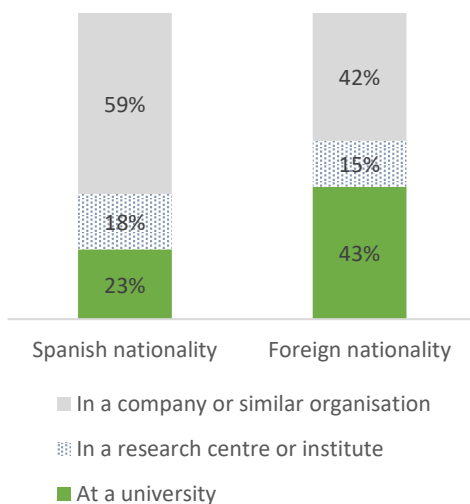
	Spanish nationality	Foreign nationality
% employed	96%	95%
% working in Spain	89%	41%

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Around 4 out of 10 foreign doctoral graduates of Catalan universities are working in Spain three years after graduation

- > The remaining 6 out of 10 work in another country.
- > Meanwhile, 9 out of 10 Spanish doctoral graduates are employed in Spain.

Figure 70. Distribution of doctoral graduates by workplace and nationality (2023)

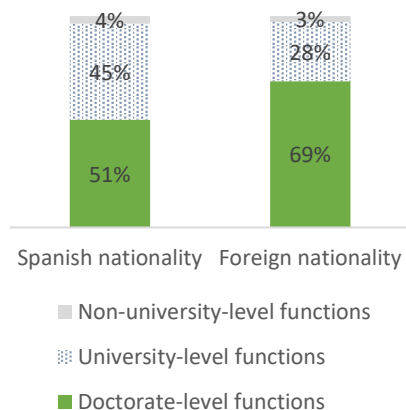


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Universities employ 43% of foreign doctoral graduates

- > The proportion of Spanish doctoral graduates working at universities is much lower (23%).

Figure 71. Distribution of doctoral graduates by suitability of work and nationality (2023)



Most foreign doctoral graduates perform functions that are suited to their level of education

- > Sixty-nine per cent of foreign doctoral graduates perform doctorate-level functions at work, compared with 51% of their Spanish counterparts.

Table 9. Graduates' satisfaction with their PhD programme by nationality

	Spanish nationality	Foreign nationality
Content and quality of training activities	6.2	7.4
Quality of doctoral thesis supervision	8.2	8.4
Quality of departmental resources and availability to conduct research	7.1	8.0
Overall satisfaction with the PhD programme	7.4	8.1

Foreign doctoral graduates are slightly more satisfied with their PhD programme than their Spanish counterparts

- > Foreign doctoral graduates are more satisfied with all aspects of their PhD programme.
- > Both foreign and Spanish doctoral graduates are most satisfied with the quality of their doctoral thesis supervision.
- > The overall satisfaction of foreign doctoral graduates with their PhD programme is 8.1, which is higher than the satisfaction of their Spanish counterparts (7.4).

BIBLIOGRAPHY

- > IRISH UNIVERSITIES ASSOCIATION - IUA (2008). *PhD Graduates' Skills*. Dublin: IUA (p. 8).
- > JOINT QUALITY INITIATIVE (2004). *Shared 'Dublin' descriptors for Short Cycle, First Cycle, Second Cycle and Third Cycle Awards*.
- > OECD (2022). *Educación de un vistazo 2022: OECD Indicators*. Paris: OECD.
- > VITAE (2010). *Researcher Development Framework* (p. 23).
- > LEAGUE OF EUROPEAN RESEARCH UNIVERSITIES - LERU (2010). *Training talented researchers for society: Doctoral studies beyond 2010*.

DATA SHEET

Table 5. Survey of doctoral graduates

Population	People who graduated from a PhD programme in the 2017-2018 and 2018-2019 academic years (and for whom we have a valid means of contact)
Survey period	Fieldwork combining two survey methods: - online, from 7/11/2022 to 4/12/2022 (47% of the sample) - telephone, from 16/01/2023 to 22/02/2023 (53% of the sample)
Participating universities	UB, UAB, UPC, UPF, URL, UdL, UdG, URV, UOC, UVic-UCC, UIC and UAO CEU

Table 6. Population and sample of Spanish doctoral graduates

	2008	2011	2014	2017	2020	2023
Population	1,611	1,824	2,080	2,661	4,198	2,974
Sample	934	1,225	1,426	1,394	1,945	1,871
Response rate	58.0%	67.2%	68.6%	52.4%	46.3%	62.9%
Sampling error	2.1%	1.6%	1.5%	1.8%	1.7%	1.4%

Table 7. Population and sample of foreign doctoral graduates

	2017	2020	2023
Population	1,243	1,718	1,686
Sample	152	258	619
Response rate	12.2%	15.0%	36.7%
Sampling error	7.6%	5.7%	3.2%

Agència per a la Qualitat del Sistema Universitari de Catalunya
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