

The Future of PhD Holders

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Their suggestions for improving job transition after the doctorate



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Observatory of Research and Scientific Careers - F.R.S.-FNRS

Thanks to funding from the Federation Wallonia-Brussels (FWB), the Observatory of Research and Scientific Careers was created in September 2018. Integrated in the F.R.S.-FNRS, this structure aims, among other things, to track and analyse the careers of researchers in the FWB through surveys and data cross-referencing. In collaboration with the six FWB universities, the Observatory is responsible for developing knowledge on the doctoral and postdoctoral process. It makes recommendations to facilitate the professional transition of PhD holders and optimise the doctoral process in order to meet the expectations of researchers and society. Particular attention is paid to the various obstacles to a scientific career: stereotypes and discrimination related to gender, constraints related to the requirement of international mobility, impact of the pressure to publish early in one's career, etc. The results of surveys and analyses are systematically published on the site: <http://www.observatoire.frs-fnrs.be>

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Executive summary

As the number of available academic positions has not increased in proportion to the increase in the number of PhD holders in the Federation Wallonia-Brussels (FWB), a growing number of PhD holders are entering the non-academic labor market (Bebiroglu et al., 2019). For PhD holders in the FWB who obtained their degree between 2012 and 2018 and participated in the "Future of PhD Holders" survey, the unemployment rate is low (3.8%) and the length of time it takes to find a new job is relatively short (72.2% of PhD holders find a new job in less than 4 months after obtaining their degree) (Bebiroglu et al., 2019). Nevertheless, the job transition after doctoral completion seems complex. For example, only 56.3% of PhD holders from the sample (n = 1998) agree or totally agree with the statement that their job transition after obtaining their PhD degree had been "relatively easy". In this context, questions arise as to the preparation for the post-thesis, even more so when one notices that only 49.1% of the participants declare to have been aware of the career opportunities they could aspire to after obtaining their doctorate.

The proposals to improve the job transition of doctorate holders presented in the questionnaire were received very positively by PhD holders in the FWB. These proposals included promoting the added value of the doctorate, strengthening collaboration with other sectors, or even further developing transferable skills training. Beyond these elements, this report examines the suggestions made by PhD holders to an open-ended question: what suggestions do they have to improve the job transition of PhD holders? In other words, how could this transition be improved or reinforced?

21.7% of participants to the survey (n = 449) formulated a total of 516 suggestions, proposals, orientations and/or priorities which were coded and divided into nine categories: research funding, opening up the academic world, PhD valorisation, career management, training, networking, information on career prospects, doctoral supervisors and other. These categories are detailed and explained in this report, along with examples of suggestions.

It emerges from this varied set of responses that the attractiveness of an academic career is still present among those who made suggestions, but that the transition to other professional sectors looms however on the horizon in the short, medium, and long term, whether by choice or by default. In addition, it turns out that this transition does not take place automatically in a smooth and easy way, and that a minimum preparation seems necessary insofar as the respondents who made suggestions say that they are waiting for a more effective support, a better preparation for the post-thesis and clearer perspectives.

Job transition after doctoral completion is a recent issue which is accompanied by new demands, new needs for both direct (individualized support in career management, training in transferable skills) and indirect support (PhD valorisation, to be open to other professional sectors). While this issue is not unknown to universities, which have been strongly developing their initiatives in this area for many years, the collected data show that efforts must continue and that the answer given to the issue of job transition after the doctorate cannot be uniform and must involve, in one way or another, all stakeholders.

1. INTRODUCTION. A COMPLEX JOB TRANSITION

Between December 2018 and January 2019, the Observatory of Research and Scientific Careers conducted a **survey entitled the “Future of PhD holders”, examining the employment status of individuals who completed their doctorate in the Federation Wallonia-Brussels (FWB)** between 2012 and 2018. 2065 PhD holders took part in the survey, the details, and main results of which have been presented in [previous publications](#) (Bebiroglu, Dethier & Ameryckx, 2019, 2020).

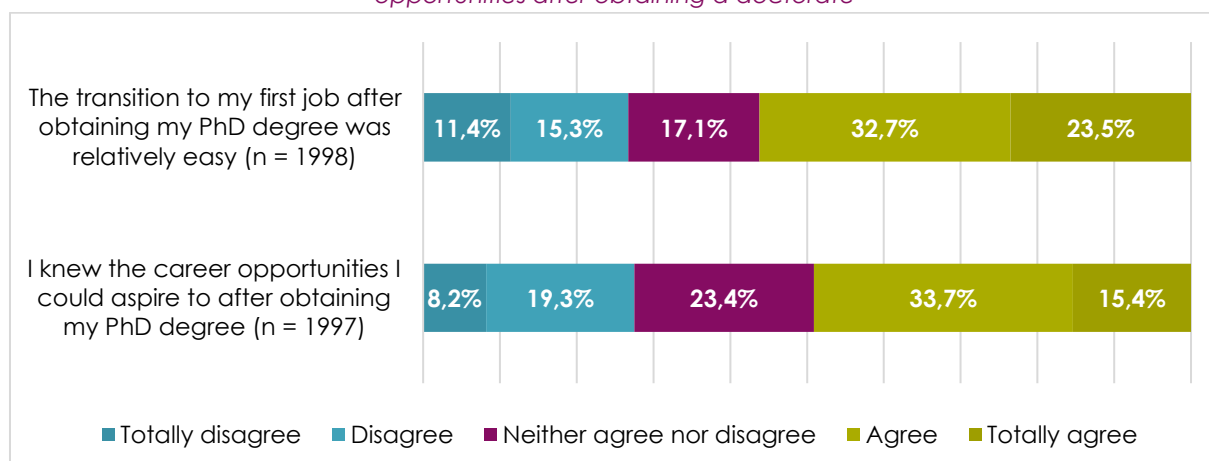
After obtaining their doctorate, PhD holders from FWB overall can choose two paths: pursuing an academic career or moving on to a career in another professional sector. These two paths each have their own attractive aspects, but they also present certain obstacles. The first path, an academic career, is an attractive option, albeit a very competitive one. The number of academic positions available has not increased in proportion to the growth of the number of PhD holders in the FWB (Bebiroglu et al., 2019). As these vacant posts are open internationally, the likelihood of obtaining a permanent position in the FWB is low, particularly as PhD holders from a given year are also competing with the preceding cohorts (Bebiroglu, 2020).

Despite these limited employment prospects, the motivation of PhD holders to pursue a career in the university sector appears to remain high: 44.4% of respondents held a position in the university sector at the time of the survey (Bebiroglu et al., 2019). This means that they had already embarked on an academic journey made up mainly of temporary contracts, with limited long-term prospects. It also appears that after years of unstable postdoctoral employment, PhD holders gradually end up leaving academia (Bebiroglu et al., 2020).

The second path is a non-academic career which the majority of PhD holders drift towards – through intention or by default – especially as many of those who continue their career at university will gradually depart from the academic world as the years go by. The **outlook for employment outside academia seems better overall in terms of opportunities and career stability**, insofar as there are far more people with a permanent contract outside university (for example, 72.2% in the “government/public services” sector, or 91.9% in “industry”, compared with 40.2% in the “university” sector). However, the survey data show some discrepancies and barriers that call into question how satisfactory the transition is for all PhD holders (Bebiroglu et al., 2020).

Indeed, while the majority of respondents said they quickly found a new job (72.2% in under four months) after they completed their doctorate and that the unemployment rate can be considered as low (3.8%), other elements indicate that **post-PhD job transition can nevertheless be complex**. For example, only 56.3% ($n = 1124$) of PhD holders from our sample agreed (or totally agreed) with the statement that joining the workforce after their doctorate had been relatively easy. In this context, there are questions to be asked about preparing students for the post-thesis phase, especially since we can see that only 49.1% ($n = 981$) of respondents to the survey agreed (or totally agreed) with the statement that they were aware of the career opportunities that they could aspire to after obtaining their doctorate (Figure 1). Details of the responses by main field of research, gender, sector of professional activity and number of years since completing their doctorate are available in appendix 5.2 (p. 14).

Figure 1. Perception of the ease of job transition after the doctorate and knowledge of career opportunities after obtaining a doctorate



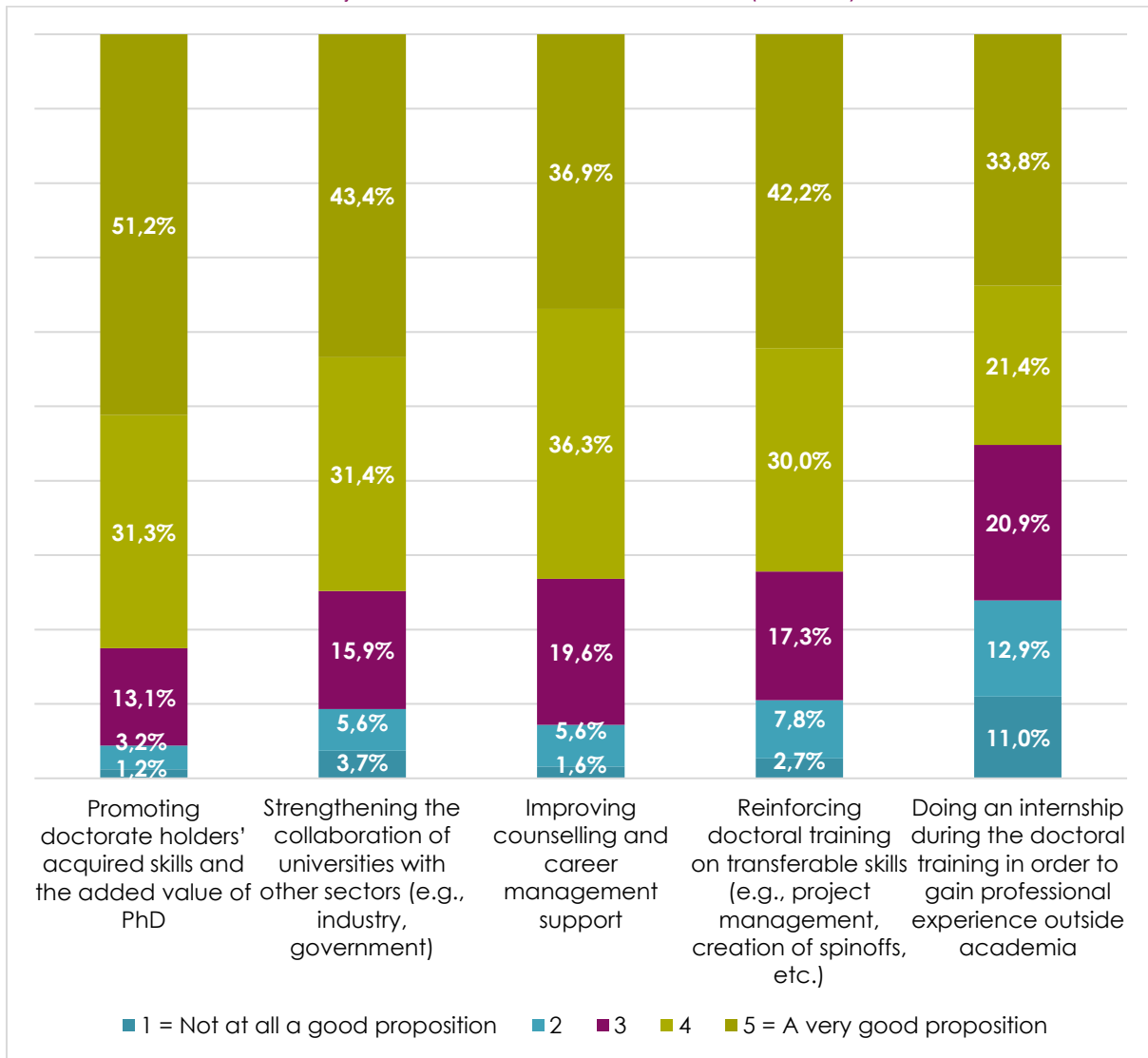
So, how can we encourage a better job transition and improve the contribution of PhD holders across all professional sectors? This will be the subject of this report, which dwells on the suggestions of PhD holders: **what suggestions do they have to improve the job transition of doctorate holders?**

2. HOW CAN POSTDOCTORAL JOB TRANSITION BE IMPROVED?

2.1 Propositions used in the survey

In the survey, PhD holders were first asked to express their opinion, on a scale of "1 = Not at all a good proposition" to "5 = A very good proposition", for the following five propositions: promoting doctorate holders' acquired skills and the added value of PhD, strengthening the collaboration of universities with other sectors (e.g., industry, government), improving counselling and career management support, reinforcing doctoral training on transferable skills (e.g., project management, creation of spinoffs, etc.), and doing an internship during the doctoral training in order to gain professional experience outside academia (Figure 2). Details of the responses by research field, gender, sector of employment and number of years since doctoral completion are available in appendix 5.3 (p. 16).

Figure 2: "To what extent do you find the following propositions useful to improve the job transition of doctorate holders?" (n = 1964)



These various propositions were widely supported by the respondents: 81.9% considered the proposition to promote the added value of PhD to be a good or a very good proposition, strengthening the collaboration of universities with other sectors was found to be a good or a very good proposition by 74.4% of respondents, improving counselling and career management support by 73.2% of respondents, expanding doctoral training for transferable skills by 72.4% of respondents, and doing an internship during the doctoral training by 55.7% of respondents.

Drawing conclusions from the responses to these questions should be done carefully. On the one hand, they do not necessarily relate to a lack or absence of elements that seemingly do not exist in universities or in the university sector in the broad sense. **It is a matter of thinking about ways to improve or reinforce them, without excluding propositions for possible additions.** On the other hand, the propositions in the questionnaire were designed more to provide a non-exhaustive panel of directions, rather than practical suggestions – and they did not include, for example, suggestions specifically targeting the pursuit of an academic career.

Nevertheless, these initial elements show that PhD holders **request for change in their preparation for job transition** and that they are not opposed to the prospect of joining the job market outside the university sector.

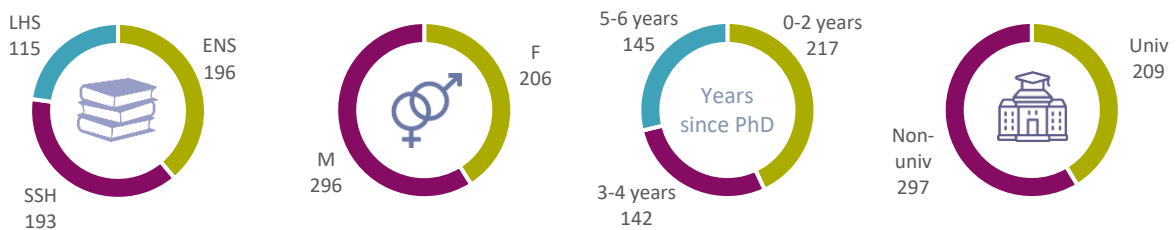
2.2 Open suggestions from PhD holders

As part of the same questionnaire, respondents were then invited to answer the following open-ended question: “Do you have any other suggestions to improve the job transition of doctorate holders?”. 21.7% of the respondents (n = 449) put forward a total of 516 suggestions, propositions, directions and/or priorities that were coded and divided into nine categories (Figure 3).

Figure 3: Categories of suggestions made by the PhD holders (n = 516)



Numbers of suggestions broken down by research field, gender, number of years since doctoral completion and sector of employment at the time of the survey¹



¹ A glossary of acronyms and abbreviations is available in appendix 5.1, p. 14.

➤ “Research funding” (88/516 – 17.1%):

88 suggestions out of the 516 recorded were dedicated to this category, which mainly calls for an **increase in research funding**. Scientific research is described on a number of occasions as “underfunded” in the FWB, preventing some researchers from pursuing an academic career. For these respondents, it is **imperative to offer more positions** after doctoral completion, either via postdoctoral contracts or **permanent positions**, which respondents mention more frequently.

*“Invest massively in research to enable brilliant researchers wanting to continue their research to do so.”*²*

“Increase funding to the FNRS. It's a shame it has so little money.”

“Improve financing mechanisms of universities so that they can retain their experienced researchers. The current funding model is based mainly on young researchers doing the main job while acquiring their PhD competences, and then they are kindly asked to go elsewhere. This is not a good model for top-quality research in universities.”

In addition, the issue of research funding is not only a request for an increase in budget, but also for a budgetary reorganisation: indeed, twenty comments directly equate the low number of positions available after the doctorate with the large number of doctoral grants awarded each year. **According to these respondents, a reduction in doctoral contracts would make it possible to fund a larger range of postdoctoral contracts and open new permanent positions**, resulting in “rebalancing”.

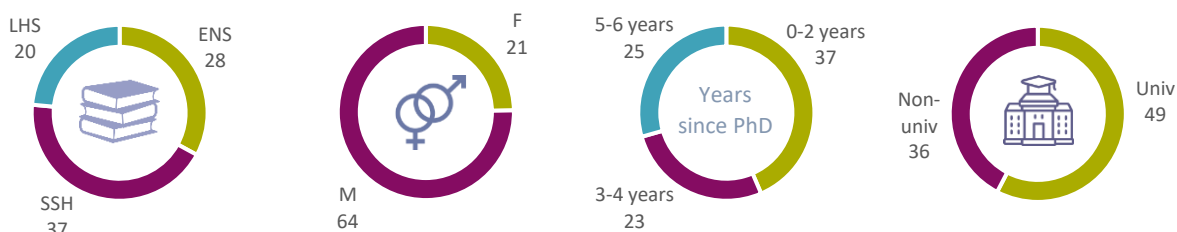
“Balance the population of PhD holders with the number of permanent positions”.

*“Reduce the number of doctoral scholarships in favour of postdoc positions or jobs with permanent contracts at university for PhDs.”**

A more specific request also relates to the creation of an intermediate professional status between the postdoctoral position and the permanent academic position. This would be a status – corresponding for example to the current positions (albeit only a few) of “research logisticians” – making it possible to stabilise the pursuit of a career in research, without necessarily aiming for a professorship.

*“Increase university budgets to fund research posts in the continuity of the doctorate, without having to become an assistant or professor.”**

*“Create a stable professional status between postdoc and PI [Principal Investigator]”.**

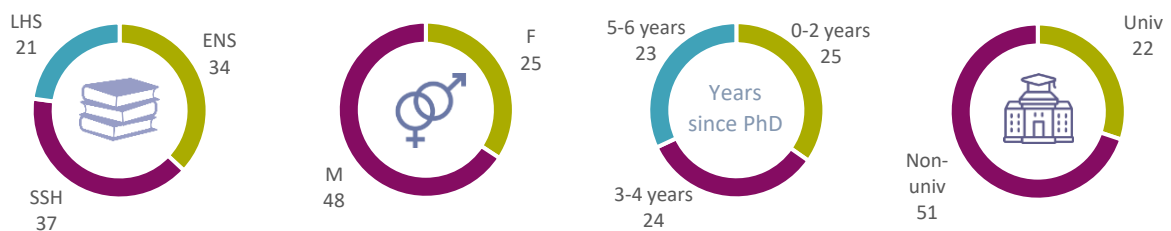


² The excerpts with “*” were originally written in French and then translated for this report.

➤ “Opening up the academic world” (75/516 – 14.5%):

These respondents argue for **universities to “open up” to the outside world** by **boosting collaborations, links, and encounters with other professional sectors**. Beyond a wish to open up the academic world more generally, which is considered – according to the comments – to be traditionally turned in on itself, it would be a question, for example, of thinking about potential transfers of knowledge and skills in a person’s continued professional career, promoting mobility between sectors, having more contacts with the outside while completing the doctorate, and perhaps even including individuals from other sectors in the thesis committees.

*“More links between research results and industry need. Sometimes there’s a big gap.”**
*“For those sectors where it’s more complicated to find employment, to work from the outset with a company, non-profit organisation, etc. in defining a specific problem in the field that needs resolving and which could go towards enhancing the work of PhD students and their skills.”**
*“Let the academic sector be more connected to social and cultural reality so that it can open up more to the outside and enable PhD students to have a broader choice; also to get away from their particular research field (not all PhD candidates are top-level researchers of the future, but they are active members of our society in all fields).”**
*“Obligation to have people from the private sector in the jury and, where appropriate, on the thesis committee”.**



➤ “PhD valorisation” (70/516 – 13.6%):

PhD holders have several years of work experience and have acquired numerous transferrable skills, such as problem solving or analytical skills (Bebiroglu et al., 2020). Yet, a lack of knowledge about the skills they have acquired, and non-academic employers’ stereotypes of scientists blocked in their studies, who are more at ease being allegedly “isolated” in their laboratories than working in a dynamic private company, are seen here as an obstacle to employment.

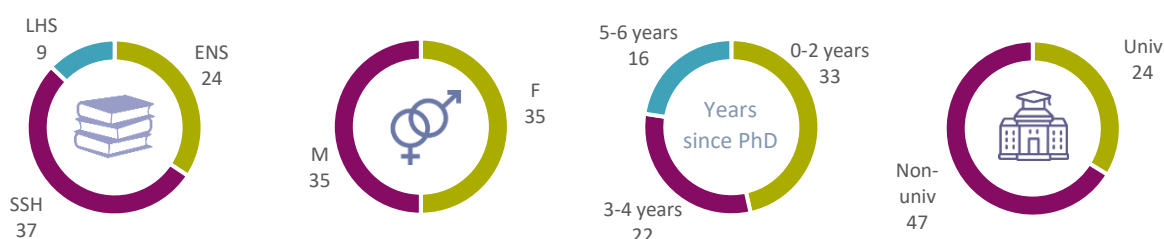
*“Reduce the fear of professionals/future employers that we are going to leave or get bored in our work, a better view of what having a PhD means (such as real working experience) for companies.”**
*“In particular make private sector recruiters who don’t know much about PhDs and who mistrust them more aware of what a PhD is. I’ve had more contacts and found a job by cutting out my PhD from the education section of my CV. I included my PhD as part of my experience, but under another heading.”**
*“What really needs to change is the image that researchers have. The image of “Professor Calculus”, whose feet aren’t on the ground – and so a person that no one wants in their company”.**

This means that requests for valorisation include **promoting the skills of PhD holders to the world outside the university, demonstrate the added value they bring and break down the stereotypes around them.**

*"Companies also need to have a better understanding of the profession of the researcher (PhD student/postdoc), then they would understand the added value of hiring a young PhD holder. Better information about the skills of PhDs needs to be disseminated to companies."**

Furthermore, 14 of the 70 comments associated with PhD valorisation also point to the **lack of salary recognition of having a PhD in non-academic sectors**, particularly in government and education sector in the FWB.

*"The public authorities need to recognise the qualification of having a PhD (separate pay scale), at least where scientific positions are concerned (which is currently not the case for the FWB, even though it regulates these qualifications...)."**



➤ "Career management" (66/516 – 12.8%):

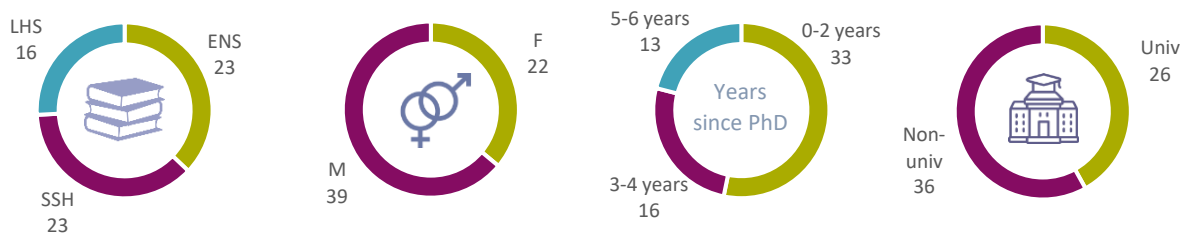
These suggestions cover smart **management of professional careers and preparation for the job transition after completing a PhD, whether at university or in other sectors**. For those individuals who made comments about this, the issue of career management needs to be considered while doing a PhD, or at least around thesis defence. These respondents are asking to receive **advice** or guidance in career management, among other things through effective systems available on the topic, offering **individual guidance**. They also request help in their preparations to look for a job (writing an attractive CV, learning how to conduct a recruitment interview, etc.).

"Training on job searching and interview preparation".

*"Imposing a form of questioning at the beginning or at the end of the research to be able to define the applied side of one's research in order to define the place one might potentially have in the society."**

"Also, all students should be encouraged to have regular (e.g. yearly) career meetings to discuss their career progression with the career services. This way, they know what skills to focus on, during their PhDs, to have the best chance of landing a job in their chosen industry."

*"Offering post-PhD guidance would be more relevant, because while we're studying, we have to focus 100% on our research. I really can't see, given the pressure I was already under to manage my research, at what point I could have jammed in work experience in a company or some form of non-academic collaboration."**



➤ "Training" (57/516 – 11.0%):

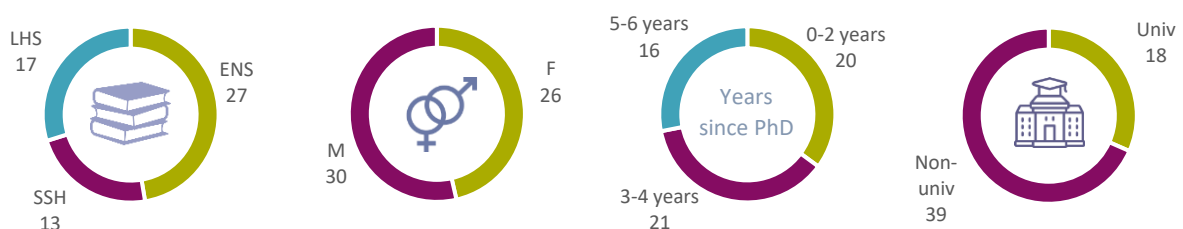
This category relates mainly to a request to **gain transferrable skills** (three respondents also asked for training in their specific field of research) as part of doctoral programme: languages, IT, business, management, translating complex information into easily comprehensible information, teamwork, communication, etc. These skills are important in any professional sector and may also help boost the confidence of PhD holders when they are seeking employment.

*"Training in team management is ABSOLUTELY overlooked. Yet PhDs are often required to have a team under their wing. Managing people is much more difficult than studying any scientific matter or using any device."**

*"Add courses in business management, IT, communication."**

*"Have a doctoral school worthy of the name. Zero at [*****] University."**

*"Make a list of the skills required for each job in a company and work on developing those abilities as part of the doctoral training."**



➤ "Networking" (56/516 – 10.9%):

Networking practices were regularly mentioned as positive elements for continuing a professional career – both at university and outside. The main initiatives put forward are both formal and informal, and concern Belgium and foreign countries. These initiatives encompass exchanges **among scientists** (symposiums), PhD candidates, **alumni**, and laboratories from the North and South, or **sharing experiences** with PhD holders from diverse backgrounds, **mentoring** or encounters in "circles" bringing together people from different sectors.

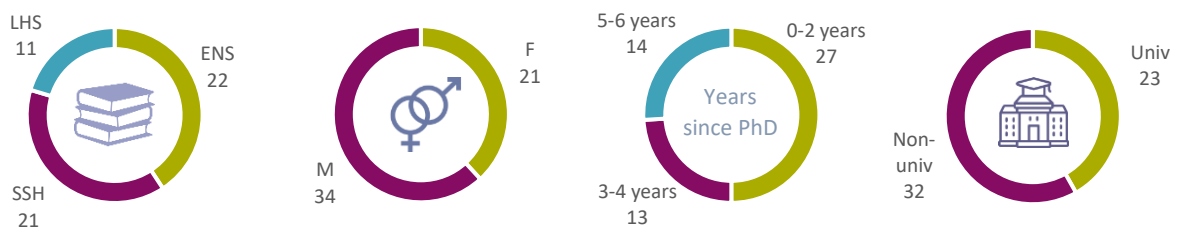
"Networking, not being afraid to talk with people in conferences."

*"Actual meeting with PhDs working in the private sector or elsewhere. To obtain feedback about the transition from academia to the private sector".**

"Alumni network building/alumni events held by university on-site or online."

"Give opportunities to PhDs from the South so that they can update their knowledge through exchanges in laboratories in the North."*

« Create a mentoring system on career prospects with persons who are not the supervisors ».



➤ "Information about career prospects" (36/516 – 7.0%):

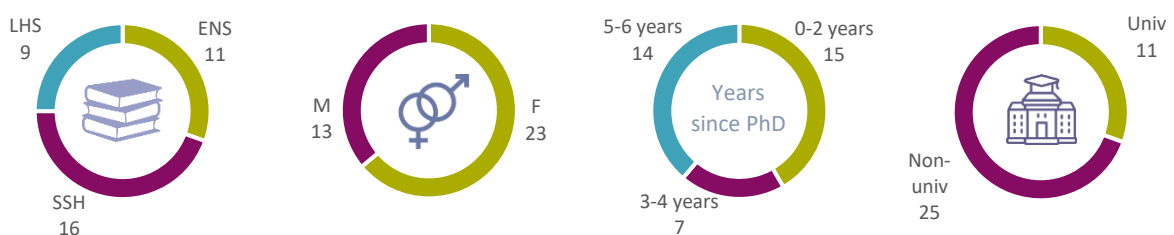
Knowledge about the labour market and job opportunities appears relatively limited for some respondents of the survey. These individuals are asking for more **transparency about career prospects** for PhD students, both in academia and outside. They are looking for **more information about the job market, job ads, promising sectors, etc.** Such information would also enable a better-informed decision to start a doctorate and make the career prospects more concrete.

"Try that the PhD student is aware of its career opportunities at the beginning of his/her training."

"Provide statistics of job transitions of doctorate holders."

"Give complete lists of Belgian companies that might hire people with PhDs. The private sector is a blurred one for the majority of PhD holders and they don't really know what to look for."

"Where is a PhD useful? I currently have no idea outside of academia. Be useful to know more about opportunities in private and other public institutions."



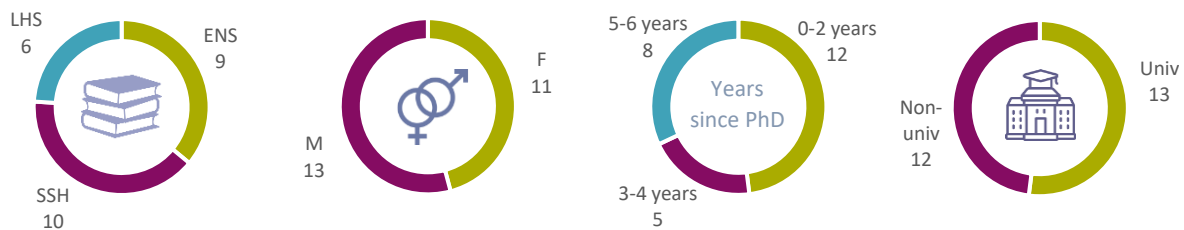
➤ "Doctoral supervisors" (25/516 – 4.8%):

These suggestions demonstrate a **need to be better guided individually by supervisors** who may not be present enough and/or who are not sufficiently trained to supervise. For these individuals, a supervisor should consider the candidate's postdoctoral prospects, with good knowledge of the characteristics of non-academic sectors. By being better prepared themselves, doctoral supervisors would then be better placed to guide and inform young researchers during their doctorate and in their career management, a career which may lead to multiple opportunities.

"Make doctoral supervisors aware of the issue."*

"Make supervisors aware of the current state of the job market and possible career directions."

"The supervisor should clearly state that working in academia is not made for everybody, and that there is high competition to get a permanent position in academia."



➤ "Other" (43/516 – 8.3%):

This final category covers a series of comments and suggestions that are very limited in number, indeed only appearing once, and not related to any of the categories previously mentioned. They include questions, among others, of the diversification of tasks while doing a PhD and international mobility.

"Stop favouring postdocs with the ability to travel internationally in order to allow Belgian researchers (certain of whom are unable to travel abroad for personal reasons) to be able to pursue a professional career in their country."*

"Teaching, even if you have a grant: without such experience, you are not considered for any job in academia after the defence."

3. DISCUSSION: POSTDOCTORAL JOB TRANSITION: A NEW ISSUE

This report analysed PhD holders' open suggestions to improve postdoctoral job transition, data coming from the "Future of PhD Holders" survey. Suggestions received confirm the **coexistence of the two joint trends detailed previously** (Bebiroglu et al., 2019). On the one hand, there is an attraction for scientific research that is still important, with a **request for more career opportunities at university** and hence an increase in research funding in the FWB. While on the other hand, there is the **importance of a non-academic career for respondents** and the job transition to sectors outside of university, with a wish that this direction be taken into consideration more often, and prepared, supported and valued more.

As we have seen, the calls for more research funding were accompanied in part by a wish for fewer doctorates, which would enable the research budget to be devoted to the training of only the most promising researchers and hence increase their chances of having a permanent position afterwards. Yet given the European targets linked to the *knowledge economy*, this trend does not appear to be heading towards a reduction in the number of doctorates funded in the future (Dethier, Bebiroglu & Ameryckx, 2019). Also, while the **structural refunding of research is a topic regularly voiced by the F.R.S.-FNRS³ and the universities of the**

³ For example, in its "Plan Phare 20.25": [https://www.frs-fnrs.be/docs/FRS-FNRS PHARE 2025.pdf](https://www.frs-fnrs.be/docs/FRS-FNRS_PHARE_2025.pdf).

FWB⁴, seeing it come to fruition is difficult to foresee in view of an overall budget picture that appears to leave relatively little room for manoeuvre in the extension of public funding.

However, it should be remembered that it is, of course, not realistic to provide permanent positions for the many PhD holders wanting them among the 900 individuals who achieve this level of qualification each year in the FWB – although the total number of academic staff is at 2,239.98 FTE⁵, the number of positions open annually is around 80 on average (Bebiroglu & al., 2019). As a result, while an increase in funding enabling more positions would be welcome, it would not resolve the issue of job transition for PhD holders and would not satisfy the expectations of many wanting to pursue an academic career.

This means that more and more PhD holders **find themselves, by choice or by default, in the non-academic job market** and, while this is the outlook for the vast majority of them in the short, medium or long term, it **requires a minimum amount of preparation**. According to the data presented in this report, the transition into the workforce does not necessarily happen smoothly and easily. Some people feel somewhat lost in terms of their future after completing their PhD and they need guidance, clearer prospects, and more practical advice on the post-thesis preparation.

This issue of PhD holders joining the workforce is relatively new and is linked to the greater numbers completing their PhD in the past 20 years (Andres & al., 2015), resulting in the **appearance of new demands and new needs** for support that are both direct (individualised guidance in career management and transferrable skills training) and indirect (valorisation of PhD, opening up to other employment sectors). And the fact that this issue is a recent one explains that preparing PhD holders for the labor market is not yet firmly established in universities.

It is important to state, as mentioned above, that **job transition is not an unknown and ignored issue in universities** and that these higher education establishments have each extensively begun to adapt in order to be more in step with the evolution of doctoral research. Over the past few years, universities have invested in major initiatives associated with career management and the professional development of PhD candidates. Every university now offers training programmes on transferable skills aimed at facilitating the job transition of their PhD candidates. In addition, Doctoral training has now become an official component of the doctoral programme in FWB, especially through university doctoral schools, in line with the “Paysage” decree of November 7th 2013, the aim of which is to support PhD students in their research work and to promote the acquisition of transferable skills and expertise related to a particular field.

While it is not possible to list all the existing initiatives and programmes here, the projects developed by the six universities of the FWB as part of the *PhDs@Work* project represent **good examples of their desire to develop employability and career management and to link PhD holders more to non-academic sectors**:

- the *PhD Welcome Pack*⁶ contains a great deal of information about PhDs, including the added value of the degree and the skills acquired, about the employability of PhD holders and about preparation for life post-thesis. It also deals with the relevant services and individuals with knowledge and experience in the matter;

⁴ For example, in the memorandum from the Council of Rectors in view of the 2019 legislative elections: http://www.cref.be/communication/20181204_Memorandum_CREF_2018.pdf.

⁵ CRef, 2016. http://www.cref.be/annuaires/2016/tab_4-1-1.pdf.

⁶ <https://www.unamur.be/recherche/euraxess/phd-welcome-pack>. This “PhD Welcome Pack” also contains the results of the first report to come out of this survey (Bebiroglu & al., 2019).

- the *Net@Work*⁷ workshops are meeting spaces aimed at PhD students, enabling them to think about the work opportunities after they complete their thesis, drawing on a wide range of testimonials from PhD holders;
- mentoring programmes⁸ aimed at guiding young researchers in structuring their proposed employment project inside and outside university;
- etc.

The results from the Observatory survey clearly show the need to **continue developing this work**, in line with some recommendations recently formulated by the OECD working group on precarity of research careers (OECD, 2021). There is no doubt that universities and the FWB have a major role to play in this, but they are not the only ones. The sheer range of suggestions presented above, similar to those collected by Afonia, Salmon, Quailley & Lambert (2021), should focus on the fact that **the answer given to the issue of post-PhD job transition cannot be the same for everyone and must involve all the stakeholders (universities, funding agencies, doctoral supervisors, government...) in one way or another.**

⁷ <https://uclouvain.be/fr/chercher/valodoc/doctorat-et-apres.html>.

⁸ <https://web.umons.ac.be/fr/alumni/votre-accompagnement-en-insertion-professionnelle/>.

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5. APPENDICES

5.1 Glossary of abbreviations and acronyms

Research field	Gender	Number of years since doctoral completion	Employment sector at the time of the survey
ENS: Exact and Natural Sciences SSH: Social Sciences and Humanities LHS: Life and Health Sciences	F: Female M: Male	0-2 years: 0 to 2 years since doctoral completion 3-4 years: 3 to 4 years since doctoral completion 5-6 years: 5 to 6 years since doctoral completion	Univ: Individuals working in academia Non-univ: Individuals working outside academia

5.2 Details of the responses presented in Figure 1

a. *“The transition to my first job after obtaining my PhD degree was relatively easy”*

(%)	1 = Totally disagree	2 = Disagree	3 = Neither agree nor disagree	4 = Agree	5 = Totally agree
Total (n = 1998)	11.4	15.3	17.1	32.7	23.5
ENS (n = 915)	9.2	14.5	16.1	32.6	27.7
SSH (n = 624)	10.4	20.7	22.5	33.9	12.5
LHS (n = 459)	10.9	15.5	18.7	33.3	21.6
Male (n = 1130)	9.4	13.1	16.7	33.1	27.7
Female (n = 864)	13.8	18.1	17.6	32.4	18.2
Working at university (n = 912)	7.8	13.2	16.6	35.6	26.9
Working outside university (n = 998)	10.5	17.0	17.5	31.9	23.0
0 to 2 years since doctoral completion (n = 876)	11.9	13.1	17.8	33.1	24.1
3 to 4 years since doctoral completion (n = 572)	9.6	16.8	17.5	32.5	23.6
5 to 6 years since doctoral completion (n = 550)	12.4	17.1	15.6	32.4	22.4

b. "I knew the career opportunities I could aspire to after obtaining my PhD degree"

(%)	1 = Totally disagree	2 = Disagree	3 = Neither agree nor disagree	4 = Agree	5 = Totally agree
Total (n = 1997)	9.2	19.3	23.4	33.7	15.4
ENS (n = 915)	6.0	19.1	25.4	33.1	16.4
SSH (n = 623)	10.4	20.7	22.5	33.9	12.5
LHS (n = 459)	9.6	17.6	20.7	34.6	17.4
Male (n = 1129)	6.9	16.1	23.0	34.2	19.8
Female (n = 864)	9.8	23.4	24.0	33.1	9.7
Working at university (n = 912)	5.6	17.3	21.2	36.1	19.8
Working outside university (n = 998)	8.3	21.4	25.1	31.6	13.6
0 to 2 years since doctoral completion (n = 876)	7.8	17.6	22.5	36.5	15.6
3 to 4 years since doctoral completion (n = 571)	7.9	20.5	24.3	32.9	14.4
5 to 6 years since doctoral completion (n = 550)	9.3	20.7	23.8	30.0	16.2

5.3 Details of the responses for the items in the question "To what extent do you find the following propositions useful to improve the job transition of doctorate holders?" (Figure 2)

a. "Promoting doctorate holders' acquired skills and the added value of PhD"

(%)	1 = Totally disagree	2 = Disagree	3 = Neither agree nor disagree	4 = Agree	5 = Totally agree
Total (n = 1964)	1.2	3.2	13.1	31.3	51.2
ENS (n = 896)	1.3	3.7	14.3	31.8	48.9
SSH (n = 614)	1.3	3.4	10.4	26.2	58.6
LHS (n = 454)	0.7	2.6	16.3	35.5	44.9
Male (n = 1105)	1.4	4.1	14.9	31.0	48.6
Female (n = 855)	0.9	2.3	11.8	30.9	54.0
Working at university (n = 902)	1.0	2.5	12.1	32.2	52.2
Working outside university (n = 984)	1.3	4.1	14.5	32.3	47.8
0 to 2 years since doctoral completion (n = 865)	1.0	3.4	13.5	29.8	52.3
3 to 4 years since doctoral completion (n = 561)	0.7	3.6	12.8	30.1	52.8
5 to 6 years since doctoral completion (n = 538)	1.9	3.2	14.3	33.5	47.2

b. "Strengthening the collaboration of universities with other sectors (e.g., industry, government)"

(%)	1 = Totally disagree	2 = Disagree	3 = Neither agree nor disagree	4 = Agree	5 = Totally agree
Total (n = 1964)	3.7	5.6	15.9	31.4	43.4
ENS (n = 896)	2.1	4.6	14.1	31.4	47.9
SSH (n = 614)	8.0	8.1	18.9	30.0	35.0
LHS (n = 454)	1.3	3.7	17.2	30.2	47.6
Male (n = 1105)	4.2	5.7	16.7	29.7	43.7
Female (n = 855)	3.3	5.3	15.7	31.8	44.0
Working at university (n = 902)	3.2	10.1	18.4	29.0	39.2
Working outside university (n = 984)	2.5	4.3	15.0	32.0	46.1
0 to 2 years since doctoral completion (n = 865)	3.9	4.3	18.5	29.0	44.3
3 to 4 years since doctoral completion (n = 561)	3.7	5.9	14.1	31.7	44.6
5 to 6 years since doctoral completion (n = 538)	3.5	7.1	15.1	32.2	42.2

c. "Improving counseling and career management support"

(%)	1 = Totally disagree	2 = Disagree	3 = Neither agree nor disagree	4 = Agree	5 = Totally agree
Total (n = 1964)	1.6	5.6	19.6	36.3	36.9
ENS (n = 896)	1.2	5.5	23.3	35.4	34.6
SSH (n = 614)	2.3	6.5	15.5	34.0	41.7
LHS (n = 454)	1.1	4.2	18.5	37.7	38.5
Male (n = 1105)	2.1	6.9	22.0	35.7	33.3
Female (n = 855)	0.8	3.7	16.8	35.2	43.4
Working at university (n = 902)	1.9	6.3	19.0	36.6	36.3
Working outside university (n = 984)	1.5	5.9	21.0	35.0	36.6
0 to 2 years since doctoral completion (n = 865)	1.7	5.4	21.7	34.3	36.8
3 to 4 years since doctoral completion (n = 561)	1.4	5.3	19.4	34.9	38.9
5 to 6 years since doctoral completion (n = 538)	1.3	5.8	16.9	37.9	38.1

d. "Reinforcing doctoral training on transferable skills (e.g., project management, creation of spinoffs, etc.)"

(%)	1 = Totally disagree	2 = Disagree	3 = Neither agree nor disagree	4 = Agree	5 = Totally agree
Total (n = 1964)	2.7	7.8	17.3	30.0	42.2
ENS (n = 896)	1.8	6.7	18.1	31.1	42.3
SSH (n = 614)	5.7	10.9	17.3	27.9	38.3
LHS (n = 454)	0.7	5.1	15.4	30.0	48.9
Male (n = 1105)	3.4	8.6	18.6	29.7	39.6
Female (n = 855)	1.9	6.4	15.4	29.9	46.3
Working at university (n = 902)	3.2	10.1	18.4	29.0	39.2
Working outside university (n = 984)	2.0	7.1	15.7	31.4	43.8
0 to 2 years since doctoral completion (n = 865)	4.0	7.1	18.6	29.5	40.8
3 to 4 years since doctoral completion (n = 561)	1.1	8.6	16.9	32.1	41.4
5 to 6 years since doctoral completion (n = 538)	2.4	7.6	15.2	28.1	46.7

e. "Doing an internship during the doctoral training in order to gain professional experience outside academia"

(%)	1 = Totally disagree	2 = Disagree	3 = Neither agree nor disagree	4 = Agree	5 = Totally agree
Total (n = 1964)	11.0	12.9	20.9	21.4	33.8
ENS (n = 896)	8.8	11.9	19.1	24.0	36.2
SSH (n = 614)	17.1	16.0	23.3	18.6	25.1
LHS (n = 454)	5.7	10.4	20.7	21.1	42.1
Male (n = 1105)	11.0	12.7	21.9	21.5	32.9
Female (n = 855)	10.3	13.1	19.3	21.9	35.4
Working at university (n = 902)	12.6	14.4	22.1	21.0	29.9
Working outside university (n = 984)	8.5	10.8	19.7	24.1	36.9
0 to 2 years since doctoral completion (n = 865)	10.8	12.7	21.2	20.8	34.6
3 to 4 years since doctoral completion (n = 561)	9.8	14.4	19.8	22.5	33.5
PhD holders who completed 5 to 6 years ago (n = 538)	11.5	11.3	21.2	22.1	33.8

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