

Doctorate holders in the labour market: a pool of untapped skills and competencies?

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SPECIFIC AND TRANSFERABLE SKILLS AND COMPETENCIES DURING THE PHD

Much has been written and discussed about skills and competencies. But what are skills and competencies exactly? What is the difference between them? What are subject-specific skills and competencies, and what are so-called cross-curricular, generic or transferable skills and competencies? Which frameworks effectively capture the multitude of skills and competencies in a comprehensible way and serve as a guide for self-development, selection and recruitment, training or team composition? Are existing frameworks applicable to researchers, or are specific frameworks needed to accurately reflect the skills and competencies of researchers? And is it necessary for such frameworks to differentiate between researchers active in the academic labour market and those in the non-academic labour market?

The above questions are not unrelated to developments taking place in our knowledge economy in recent years and decades. One of these striking developments is that the standard academic career path of “student - PhD student - PhD holder - professor” is now only available to a few. Currently, around 9 out of 10 PhD holders sooner or later leave the university workplace for a job in other sectors of the labour market (ECOOM-Brief 39). With this transition to the non-academic labour market, the acquired subject-specific insights, skills and competencies are also spreading throughout the business community, which benefits Flanders' competitive position. In order to facilitate the transfer and collaboration between the academic and non-academic labour markets, universities have made considerable efforts in recent years to broaden the development of young researchers and postdocs: in addition to subject-specific skills and competencies, generic or transferable skills and competencies are also actively given plenty of opportunities to develop. This framework of a broader development of researchers was originally launched within Flemish universities using their own resources, but has since been embedded in the Flemish science policy through the *Support for Young Researchers (SYR)* programme (Bongers

et al., 2018). Not only in Flanders, but also beyond, more and more projects and programmes are being set up to help researchers develop generic competencies that can increase their employability in their future careers. This is also being facilitated at European level, for example with projects such as DocEnhance (<https://docenhance.eu>).

What perception do PhD holders and academic and non-academic employers in Flanders have of the skills and competencies that researchers acquire during their PhD trajectory? And what about the research period at the university as a postdoc? Is that a “lost” period in which PhD holders develop few new skills and competencies? Is it wiser, in terms of career prospects, to leave the university for a non-academic job immediately after successfully defending one's PhD? To date, there has been no systematic research providing a clear answer to these questions. This is also the case abroad. For Belgium, we do have some initial insights based on the *Careers of Doctorate Holders 2010*, a project organised by the OECD, the UNESCO Institute for Statistics and Eurostat. The project found that PhD holders mainly referred to research skills (e.g. technical skills, specific knowledge), cognitive skills (e.g. analytical thinking), and self-management (e.g. independence, taking initiative, dealing with pressure) as skills learned during their PhD and necessary for their current job (Boosten et al., 2014). Shortcomings were mainly experienced in skills and competencies related to (project) management, communication, networking and teamwork. Furthermore, it also appears that research skills were often underutilised in current jobs (overqualification) (Boosten et al., 2014).

In what follows, we focus on Flanders and let PhD holders share their thoughts about their skills and competencies they acquired during their PhD trajectory and currently use in their current or most recent job. Specifically, we answer two questions in this ECOOM-Brief:

1. *What skills did PhD holders develop during their PhD? And how many of these are used in their current or most recent job?*

2. What skills do PhD holders use in their current or most recent job? And how many of these were developed during their PhD?

RESPONSES BASED ON THE PHD CAREER SURVEY

We answer the above research questions using the *PhD Career Survey*, which was collected by ECOOM HR in R&D in 2017. For a detailed discussion of this survey and its methodology, we refer to ECOOM-Brief 25. For a visual representation of the data collection and findings, we refer to the website <https://www.phdcareersflanders.com/nl>. In short, the *PhD Career Survey* (N = 2985) maps the academic and non-academic career paths of PhD holders who obtained their PhD at one of the Flemish universities.

In the *PhD Career Survey*, we presented respondents with the same list of 14 skills twice. At the top of the first list was *“Developed during (first) PhD”* and at the top of the second list was *“Used during current job?”*. If the respondent was not employed at the time of the survey, they were asked *“Used during last job”*. The possible answers were always: *“Yes, strongly/a lot”*, *“Yes, moderately”* or *“No”*. Viewed from the perspective of the *European Competence Framework for Researchers* (European Commission, 2022), the 14 skills surveyed belong to five specific areas of competence. Accordingly, scientific knowledge, presentation skills and writing skills belong to **“Doing research”**, while project management and negotiating belong to **“Managing research”**. Analytical thinking and learning ability fall under **“Cognitive abilities”**, while independence, taking initiative, stress management and self-confidence are part of the competence area of **“Self-management”**. Finally, the surveyed skills that belong to the competence area of **“Working with others”**, include social skills, teamwork and coaching skills.

WHAT SKILLS DID PHD HOLDERS DEVELOP DURING THEIR PHD? AND HOW MANY OF THESE ARE USED IN THEIR CURRENT OR MOST RECENT JOB?

Which of the 14 skills listed in the *PhD Career Survey* do PhD holders themselves consider to have developed during their PhD? To answer this question, we combine the two response categories “Yes, strongly/a lot” and “Yes, moderately” into a single response category “Yes”. This gives us a picture of the skills developed, as shown in Figure 1. In that figure, the height of each bar shows us the percentage of PhD holders in the *PhD Career Survey* who indicate that they developed that specific skill during their PhD. The exact percentage is shown *below the bar*. However, the picture can be made more precise: the *green and blue colours inside each bar* show the percentage of doctorate holders who developed the skill during their PhD and, respectively, who do or do not use that skill in their current or most recent job.

Let us first examine Figure 1 based on the height of the bars. We see that for many of the 14 skills, more than 9 out of 10 PhD holders indicate that they developed that skill during their doctoral programme. This is

particularly the case for the competence areas “Doing research” and “Cognitive abilities”. Specifically, this concerns scientific knowledge (99.8%), presentation skills (94.4%) and writing skills (98.0%), as well as analytical thinking (99.3%) and learning ability (94.7%). Furthermore, in the competence area of “Self-management”, we also see two skills emerging with very high percentages, independence (98.6%) and taking initiative (94.5%). In the same competence area, we also find self-confidence with 83.3% of PhD holders indicating that they developed this skill during their doctoral programme. Still within “Self-management”, we also see the skill of stress management, reported by 63.0% of PhD holders. This is only a few percentage points difference than project management (67.1%), which belongs to the competence area of “Managing research”. The skill least often reported as having been developed during the PhD also belongs to this competence area “Managing research”: negotiation (26.7%). Finally, when we look at “Working with others”, we see three skills that roughly 5 to 7 out of 10 PhD holders indicate they developed during their PhD. More specifically, these are social skills (72.0%), teamwork (63.5%) and coaching skills (47.8%).

What does Figure 1 show us when we focus on the green and blue segments in the bars? The overall picture is one in which PhD holders indicate that the skills they developed during their PhD are also being used in their current or most recent job. If we look at the competence areas “Managing research”, “Cognitive abilities”, “Self-management” and “Working with others”, we see only very small blue segments, indicating that only a very small percentage of the developed skills are not being used in the current or most recent job. The percentages vary from 0.5% for social skills to 3.0% for project management. In the competence area “Doing research”, the blue segments are slightly larger. Here, 3.8% of PhD holders indicate that their developed presentation skills are not used in their current or most recent job, 5.3% mention that their writing skills are not being used, and about 1 in 10 PhD holders (10.4%) indicate that their scientific knowledge skills are not being tapped into.

WHAT SKILLS DO PHD HOLDERS USE IN THEIR CURRENT OR MOST RECENT JOB? AND HOW MANY OF THESE WERE DEVELOPED DURING THEIR PHD?

To answer this question, we look at Figure 2, which is structured similarly to Figure 1. Based on the height of the bars in Figure 2, one general conclusion can already be drawn: with the exception of negotiation skills (75.3%), at least 9 out of 10 PhD holders indicate that they use the listed skills in their current or most recent job. Specifically, for the competence area “Doing research”, this concerns scientific knowledge (89.6%), presentation skills (95.6%) and writing skills (94.3%). For the project management skill, which falls under “Managing research”, the figure is 90.7%. In the competence area of “Cognitive abilities”, we find 99.3% for analytical thinking and 94.7% for learning ability. When focusing on “Self-management”, we see that the current or most recent job of the PhD holder largely requires independence

(99.1%), taking initiative (98.2%), stress management (87.9%) and self-confidence (95.5%). For skills related to "Working with others", results show 96.4% for social skills, 94.9% for teamwork, and 87.4% for coaching skills.

We now examine the green and red segments of the bars in Figure 2. The green segment represents the proportion of PhD holders who indicate that they use a skill in their current or most recent job and developed that skill during their PhD programme. The red segment represents the proportion of PhD holders who indicate that they use a skill but did not develop it during their PhD programme. Figure 2 reveals three clear patterns: hardly any red within the competence areas "Doing research" and "Cognitive abilities"; a mixed picture within "Self-management"; and a lot of red within "Managing research" and "Working with others". Within the competence areas "Doing research" and "Cognitive abilities", the red segments show that only a very small percentage of the skills used in the current or most recent job were not developed during the PhD. This varies from 0.2% (scientific knowledge) to 5.0% (presentation skills). We arrive at the same conclusion for the skills independence (1.3%) and taking initiative (5.1%) from the competence area "Self-management". However, we find a different result for the other skills in this same competence area: 13.6% and 26.8% of PhD holders respectively indicate that they need to use self-confidence and stress management in their current or most recent job, but did not develop these skills during their PhD programme. Furthermore, Figure 2 shows that a significant proportion of PhD holders need to work together in their current or most recent job, but they did not develop these skills during their PhD. This concerns 24.9% of PhD holders for social skills, 32.9% for teamwork and 43.3% for coaching skills. Finally, within the competence area "Managing research", as defined by *the European Competence Framework for Researchers*, approximately one in four PhD holders (26.6%) indicate that they perform project management in their current or most recent job, but they did not develop this skill during their PhD. The most striking result in Figure 2 concerns negotiation skills: 49.9% of PhD holders indicate that they have to negotiate in their current or most recent job, but that they did not develop this skill during their PhD.

DISCUSSION

Approximately 9 out of 10 PhD holders sooner or later leave the university for a job in other sectors of the labour market. This transition is not always smooth: PhD holders do not always find their way in the non-academic labour market. To facilitate the transfer of the strong knowledge base developed at Flemish knowledge institutions to the societal and economic domains, the Flemish government and universities have been committed for many years to supporting the broad development of junior researchers and postdocs - developing not only subject-specific but also transferable skills and competencies.

Based on the 2017 *PhD Career Survey*, we obtained responses from 2985 PhD holders to the question of whether they had developed 14 specific skills during their PhD programme. The wording of the question does

not allow us to determine whether the listed skills and competencies were also developed prior to the PhD programme or, if applicable, further developed after it. In addition to asking about skill development during the PhD programme, we also asked PhD holders whether they use these skills in their current or most recent job.

The analyses reveal four general patterns. Firstly, PhD holders indicate that they developed the 14 listed skills to varying degrees during their PhD programme. The skills within the competence areas "Doing research" and "Cognitive abilities" scored highest: 9 out of 10 PhD holders believe they developed these skills during their PhD. This also applies to the skills of independence and taking initiative. The competence areas "Managing research" and "Working with others" were least frequently reported as having been developed during the PhD programme: scores here vary from 5 to 7 out of 10, with the exception of negotiation skills, which scored lower: 26.7%. The skills of stress management and self-confidence were mentioned by 6 out of 10 and 8 out of 10 PhD holders, respectively, as having been developed during their doctoral studies. Secondly, almost all PhD holders who indicate that they have developed a specific skill during their doctoral studies also report using that skill in their current or most recent job. The least used skill is scientific knowledge, with 10.4% indicating it is not used. Thirdly, at least 9 out of 10 PhD holders report using the listed skills in their current or most recent job, with the exception of negotiation skills (75.3%). Finally, almost all PhD holders indicate that they use the skills in the competence areas "Doing research" and "Cognitive abilities" in their current or most recent job and that they developed these skills during their PhD. The same applies to the skills of independence and taking initiative. Skills that are used extensively in the current or most recent job, but which - according to 1 in 8 to as many as half of PhD holders - were not developed during their PhD, belong to the competence areas "Managing research" and "Working with others". The same applies to the skills of stress management and self-confidence.

The findings outlined above are based on data collected in 2017. But do these findings still provide an accurate picture of the skills and competencies of PhD holders on the labour market in 2025? We cannot give a clear answer to this question. Together with the *Careers of Doctorate Holders 2010* (Boosten et al., 2014) (Belgium), the *PhD Career Survey 2017* (Flanders) is the only database that allows for statements about the skills and competencies of PhD holders in both the academic and non-academic labour market, without being limited to one specific scientific discipline, university or faculty. Across scientific disciplines and institutions, the policy context for Flanders since 2017 has been clear: more emphasis on popularising science culture, increased attention to non-academic careers and greater mobility of junior researchers - interdisciplinary, intersectoral and international. If we look at the evaluations of SYR-resources as an indicator of changes in skills and competencies developed during the PhD, we see a clear shift between 2018 and 2023: more training in transferable skills and competencies. The SYR evaluation of 2023 (Deloitte, 2023) indicates

that 60% of the training courses offered focus on transferable skills and competencies. In 2018, this was less than half.

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Figure 1: Skills developed during the PhD, differentiated by whether they are used or not used in the current or most recent job

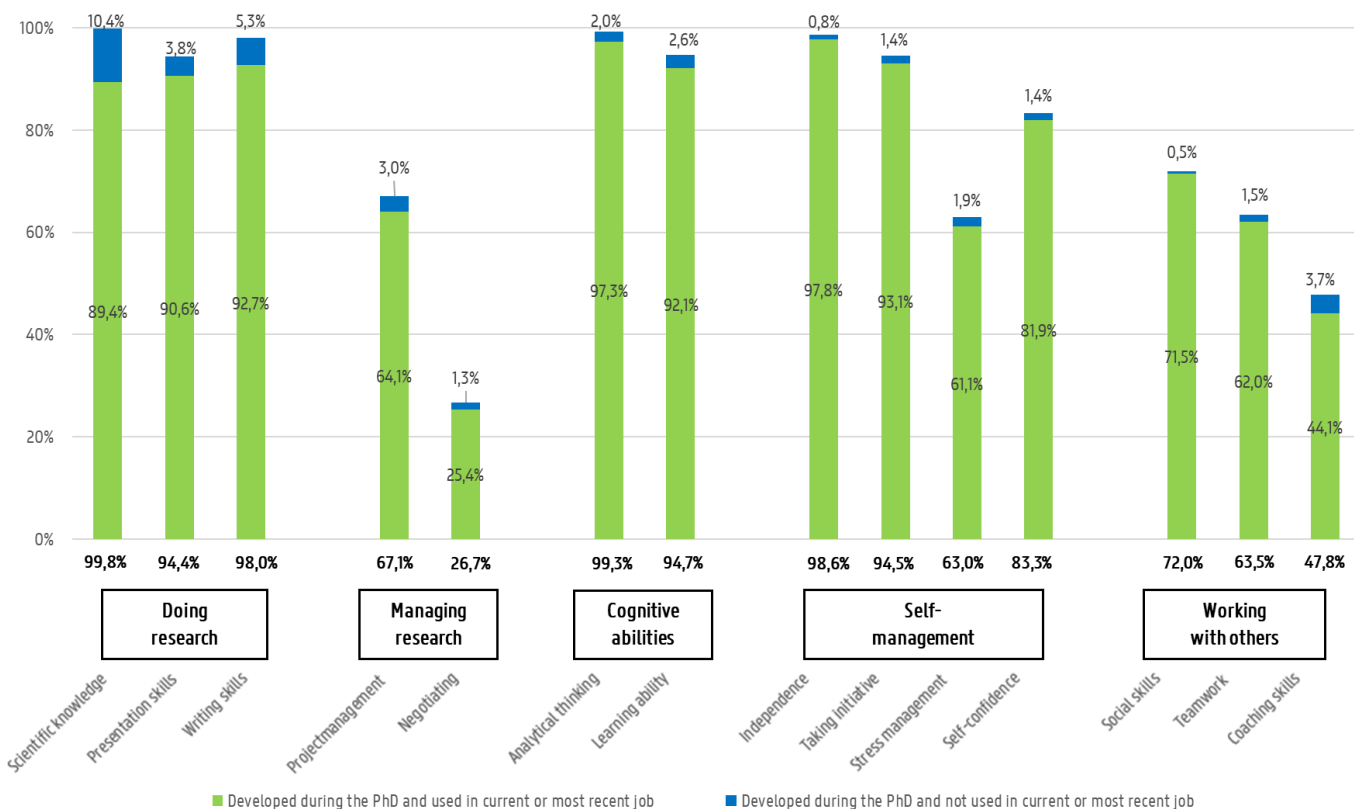


Figure 2: Skills used in the current or most recent job, differentiated by whether they were developed during the PhD

