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Strengths and weaknesses of PhD training to develop alternative careers. Insights from PhD holders working beyond academia

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Abstract

Purpose – This study aims to critically assesses how Spanish PhD holders working outside academia perceive and value their past PhD training experiences within academic PhD programs, addressing the growing need for skills applicable in various sectors.

Design/methodology/approach – Using a retrospective interpretative design, the authors collected qualitative data from 35 PhD holders who have transitioned to non-academic careers. Through multimodal interviews, the authors gathered in-depth perceptions to understand the strengths and weaknesses of existing PhD training in relation to non-academic employability.

Findings – The findings highlight a significant disconnect between academic-oriented training and the practical demands of non-academic jobs, particularly in non-research roles. While PhD training was valued in research-related non-academic positions, especially in STEM fields, it was considered insufficient for those in managerial or other non-research roles unless the training included specific industry-related projects. Participants suggested a cultural shift in PhD programs towards a more balanced academic and non-academic focus, integrating societal concerns and broader competencies like effective communication and managerial skills. These changes are seen as crucial for better-preparing PhD candidates for diverse professional environments, emphasising the need for PhD programs to evolve continually in response to the changing dynamics of the labour market and societal needs.

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Originality/value – This study contributes to the ongoing discussion about the need for PhD programs to evolve by offering a unique perspective from within the Spanish context. It underscores the necessity for educational reforms incorporating comprehensive skill training, aligning more closely with the career opportunities available to PhD graduates.

Keywords PhD training, post-PhD careers, Non-academic PhD careers, Alternative PhD careers

Paper type Research paper

Introduction

Over the past 15 years, the diversification of career pathways for researchers has significantly challenged traditional practices in PhD training. This trend compels PhD candidates to navigate various professional settings and knowledge-producing contexts, leading to increasingly flexible career paths that often extend beyond the traditional boundaries of academia (Hancock and Walsh, 2016).

The allure of a conventional academic career, historically the primary aspiration for most PhD candidates (Horta, 2018), is now moderated by a range of factors. Intense competition, limited academic positions and precarious working conditions within academia have prompted many PhD candidates to explore alternative careers (Passaretta *et al.*, 2019). In addition, the normalisation of emotional exhaustion and work-life balance challenges within academic culture has further driven some to consider non-academic career options (Hayter and Parker, 2019). Moreover, improved working conditions and prospects for professional development in alternative research sectors, such as private companies, non-profit organisations, para-public research centres and public administrations, have also drawn PhD holders away from academia (Sala-Bubaré *et al.*, 2024).

In this evolving landscape, PhD candidates are advised to prepare for transitions across a broad spectrum of professional settings (Hancock and Walsh, 2016), necessitating adaptability, flexibility and a skill set equipped for an ever-changing professional landscape. Consequently, the overarching aims of PhD education have been reevaluated over the last decade to address the challenges posed by knowledge societies (Nyquist and Woodford, 2000). This re-evaluation has highlighted two main concerns: the perceived oversupply of PhD holders and the potential mismatch between the skills acquired during PhD training and the demands of the labour market (Hancock and Walsh, 2016).

Some PhD programs' responses to these concerns, criticised for being excessively market-oriented and prioritising employability and professional skills at the expense of disciplinary expertise and commitment to societal issues (Carter *et al.*, 2018), have sparked debate. These and other critical voices advocate for rethinking PhD training from a comprehensive and balanced perspective, recognising the broader educational and social objectives inherent in PhD education and its added value in advanced economies, particularly in non-academic sectors (Maldonado, 2013; Borrel-Damian *et al.*, 2015). Various studies have argued that proposals with an exclusive market orientation might undervalue research-related skills and competencies (Cuthbert and Molla, 2015). Although these competencies have been typically considered specific to academic environments, they are also highly valued by employers beyond academia, and their acquisition in professional scenarios has proven to be challenging (Lam, 2007; McAlpine and Inouye, 2021). Therefore, balancing disciplinary knowledge, transferable skills and competencies, market relevance and responsiveness to societal needs have become crucial in preparing PhD candidates for diverse career paths (Bettencourt *et al.*, 2023; Mars and Moravec, 2022).

Throughout the European landscape, efforts have been mobilised to better align PhD training with these principles (European Commission, 2019). Following the Bologna Process

and the subsequent creation of the European Higher Education Area, and despite notable variation among countries, reforms have influenced the direction, purposes, content, competencies and skills prioritised and the conditions of PhD training.

Emphasis has been placed on steering PhD training towards responsible research and innovation (RRI), with particular attention to ethical considerations and stakeholders' involvement throughout the research cycle (Kovačević *et al.*, 2022; Mejlgaard *et al.*, 2019). Regarding content, the prevailing trend has been for PhD programs to shift from a discipline-focused skills approach to a greater emphasis on transversal or transferable competencies[1] (Durette *et al.*, 2016; Mowbray and Halse, 2010; Platow, 2012). These transversal skills and competencies encompass systematic analytical thinking and complex problem-solving skills, which are highly valued in non-academic research sectors despite being typically acquired in academic environments (Kyvik and Olsen, 2012; Barnett, 2006). In addition, several studies have highlighted the importance of interpersonal and soft skills and competencies, such as effective communication, teamwork, adaptability, innovation, ethics and conflict resolution (Jung, 2018). Moreover, European Union policies advocate for developing crucial competencies for lifelong learning (European Commission, 2019), including language proficiency, the ability to learn- to-learn, digital competence, social competence and a sense of initiative and entrepreneurship. The promotion of a diverse repertoire of skills and competencies is intended to equip researchers to better address a wide range of interdisciplinary problems that may arise in their future careers (Herrera and Nieto, 2016) and bridge the gaps between PhD training and the socio-professional demands, especially for those PhD holders working outside academia (Merga and Mason, 2021). Finally, developing these competencies depends mainly on training conditions, such as funding, promotion of international mobility and social support. Research has demonstrated that isolation, disciplinary-based training, type of enrolment and budget constraints are challenges in developing successful trajectories (Rönkkönen *et al.*, 2023; Valeeva *et al.*, 2020). Consequently, many PhD programs have tried to improve such conditions, though with varied emphasis and success (Elliot *et al.*, 2023; Taylor, 2023).

In examining the evolving landscape of PhD education, it is essential to consider recent findings regarding the perceived value of PhD degrees in various employment contexts. Guccione and Bryan (2023) have offered a comprehensive model of PhD value, highlighting its multifaceted nature and revealing that personal fulfilment, career achievements and employer perspectives significantly influence overall perceptions. They also discussed that PhD holders often view their PhD as personally rewarding endeavours, yet they questioned their value in terms of employability, particularly in non-academic sectors.

In Spain, where this study was conducted, PhD education has been reformed in alignment with national and European regulations (Royal Decree [RD] 99/2011 and 576/2023). These reforms have impacted the structure, duration, orientation and outcomes of PhD programs, to increase internationalisation, professionalisation and training personalisation. Likewise, PhD training modalities have diversified and, besides traditional academic PhD programs, industrial or professional PhD programs[2] have been developed to encompass more flexible models, including those connected with non-academic sectors (see Table 1).

The scarce studies available in Spain revealed that PhD holders often perceive their PhD training positively but noted the need for transversal and interdisciplinary skills and competencies. Difficulties in English language proficiency, securing research funding, evaluation and digital skills have also been identified (AQU, 2020; Pérez *et al.*, 2021). Besides some recent insights about satisfaction (Sala-Bubaré *et al.*, 2024), there is a lack of research regarding the Spanish PhD holders' trajectories and to what extent the reforms developed adequately prepare them for non-academic positions (Sarrico, 2022). This neglect

Table 1. Relevant core characteristics of the PhD education in Spain

Model of dissertation	Article-based (SS; STEM); monography (HUM)
Funding during the PhD	PhD scholarship (52%); work in the field of pre-PhD studies (24%)
Target time of completion	Between 3 and 4 years
Tuition fees	Between €400 and €1,000 per year, depending on whether the university is public or private Free for PhD candidates with a pre-doctoral fellowship/contract
Type of doctorates	Academic PhD (98–99%); Industrial PhD (1–2%)
Structure of doctoral education	PhD schools in each university coordinating structured PhD programmes Integrated in a research project (57%); independent project (43%)
Modality	Full-time; part-time (percentages vary across disciplines according to the funding options)

Source: Authors' own creation (AQU, 2023; Castelló *et al.*, 2023; Departament de Recerca i Universitats, 2023)

is noteworthy, given that the debates surrounding the PhD programs influence PhD candidates' choices and future experiences (Mantai, 2017).

Our study delved into the PhD holders who have undergone academic PhD programs and pursued careers outside academia. We aimed to uncover their perspectives on the training received and the gaps they identified in their professional experiences. The scarce studies in Spain informed of trends but did not explain the PhD holders' perceptions in depth since they relied on quantitative cross-sectional data. This information is expected to contribute to a more comprehensive and first-hand understanding of the evolving role of PhD training in the rapidly changing job market, the transferability of research skills and competencies across sectors and a better alignment of PhD education with the PhD holders' needs and challenges (Barry *et al.*, 2018).

Method

The study adopted a retrospective interpretative design in which we relied on PhD holders' perceptions collected through a multimodal interview.

Participants

To recruit participants, we developed a twofold complementary strategy. We first contacted stakeholders, i.e. universities, R&D companies and professional associations, and requested their collaboration in collecting potential participants. Second, we posted information about the study on social networks with an email address so potential participants could communicate their interest. In both cases, those interested provided their primary socio-demographic data through a form, and some of them spread the message to their networks, facilitating the recruitment snowball effect. We filtered all the answers received according to the following inclusion criteria: obtaining the PhD in the last 10 years; having a primary job outside academia and having a Spanish job contract.

The final sample consisted of 35 PhD holders, 16 men and 19 women, who graduated from academic PhD programs in different disciplines [science, technology, engineering, and mathematics (STEM) = 12, social sciences = 13 and humanities = 10]. All the participants worked outside academia in various sectors, i.e. private companies, public administration and non-profit organisations.

Instruments and data collection procedures

Data was collected using multimodal interviews that involved a two-step process:

(1) Pre-interview survey. Before the interview, each participant was asked to complete an initial online survey with questions related to socio-demographic data, their academic and professional background, their current job characteristics and conditions. Based on this initial information, researchers created an initial characterisation that was discussed during the interviews.

(2) Semi-structured interviews [1]. The interview included open-ended questions related to the relevance of competencies acquired through PhD training in the participants' current professional environments to explore further the strengths and weaknesses of the PhD training received. The interviews were conducted online and recorded in audio and video formats. Each interview lasted between an hour and an hour and a half.

Participants were required to sign an informed consent, in which ethical principles were informed and reiterated at the beginning of the interview. All data were pseudonymised to ensure confidentiality. The ethical commitment was approved by the authors' University Ethical Committee (Ref.: APR-FPCEE2223/01).

Data analysis

Thematic analysis (Braun and Clarke, 2020, 2022) was conducted to retrospectively explore how PhD holders working outside academia perceived their PhD training. After being transcribed, the interviews were iteratively read to gain a comprehensive understanding of the data. Subsequently, quotes related to the PhD training were identified, and recurring patterns were observed and discussed. We used three dimensions to analyse participants' discourses regarding their PhD training: *characteristics*, *attributed value* and *improvement suggestions*. The PhD *training characteristics* encompassed aspects such as the *purposes*, *structure and conditions* and *competencies and skills*, each categorised accordingly (Table 2). Participants *attributed value* to these characteristics, identifying *strengths* and *weaknesses* (Table 3). *Improvement suggestions* were derived from comments aimed at enhancing training to align it with the demands of non-academic careers. Within each dimension, quotations were coded accordingly, and subsequent thematically related quotes were grouped into categories until saturation was reached. The first three authors performed this analysis using MAXQDA20 software.

Table 2. Characteristics of the PhD training

Categories	Description
Training purposes (for what?)	Comments regarding the intended goals, objectives or desired outcomes of the training program. It includes implicit and explicit expectations of the academic community about the desired PhD trajectories
Structure and conditions (how?)	Comments referred to how the training program was organised, delivered and the circumstances under which it took place
Competencies and skills (what?)	Comments regarding the skills and competencies acquired during the PhD training (i.e. communication competencies, critical thinking and problem-solving competencies, funding and management skills, autonomy, research skills or disciplinary knowledge)

Source: Authors' own creation

Table 3. Attributed value

Categories	Description
Strengths	Participants' positive comments regarding their PhD training (i.e. benefits, added value, specific advantages)
Weaknesses	Participants' non-positive comments regarding their PhD training (i.e. limitations or deficits, absence of relevant aspects or shortcomings)

Source: Authors' own creation

Once consensus was reached on the category system, the reliability of the agreed-upon categories was ensured through independent coding of two-thirds of the interviews by the first three authors. Intercoder agreement analysis revealed agreement levels ranging from 84% to 92% across specific dimensions, validating the category system. The remaining interviews were then independently analysed by the same authors. In addition, we used the MAXQDA20 co-occurrence table to explore intersections among identified *characteristics*, *attributed values* and *improvement suggestions* within the data set, offering further insights into the findings.

It should be noted that participants did not consistently address all three characteristics of PhD training or provide *weaknesses*, *strengths* and *improvement suggestions* for each characteristic in response to the interview questions.

Results

We present the results, differentiating each *PhD training characteristic (purposes, structure and conditions* and *competencies and skills).* Within each characteristic, we first distinguish between *strengths* or *weaknesses* and then include *suggestions for improving* the PhD training.

PhD training purposes

We grouped the participants' comments around the PhD training purposes into two interrelated categories: *the PhD orientation* and its *connection to the professional labour market* (Table 4).

Those who complained about receiving PhD training as exclusively academically oriented, particularly from social sciences, considered it as "a mere formal procedure" (Carla) and highlighted it was far from preparing them for the labour market: "it prepared me zero for the world of work" (Núria). This group regretted that this academic orientation was a significant contradiction given the scarcity of academic job opportunities, as Mariona explained:

> I think that PhD training is focused on the academic sphere, right? And then one is very much imbued with the idea that the option is always to continue along the academic path […] And nowadays it's very complicated. (Mariona)

Nevertheless, participants with research-related job positions outside academia, mostly from STEM disciplines, considered this academic *orientation* a *strength*. As Manuel, they acknowledged the PhD training as a turning point in their careers: "I mean, without a PhD, no, […] No, I would have had to study another career and start from zero in another field to become a Data Scientist" (Manuel).

Table 4. Purposes of the PhD training

For what?	Weaknesses	*N*	Strengths	*N*	Improvement suggestions	*N*
Orientation	Orientation towards academic careers	8	Orientation towards research careers beyond academia	4	To provide training for research, managerial and expert roles in non-academic sectors	7
Connection	Disconnected from professional fields, social challenges and concerns	5	Connected to professional fields, social challenges and concerns	2	To enhance professional PhDs	4

Source: Authors' own creation

Most of the participants' comments revealed the disconnection between the PhD training they received and the societal challenges and concerns they encountered in their professional fields. Those participants, distributed across all disciplinary backgrounds, highlighted that their PhD programs were inefficient in bridging the gap between academia and the non-academic sector or creating intersectoral networks. The following quote is representative of these comments:

> In the training, it [transferring research into policies] didn't appear for sure. […] If you have a relevant result, you have a clear conclusion; you have to knock on the door of the public administrators and let them know […]. It's the social responsibility of a scientist. And not many times has this message not been transmitted by academia. (Sergi)

Only two participants from the humanities experienced their PhD training as connected to their professional concerns. Interestingly, they were already working in non-academic sectors during their PhD journey, so they had the opportunity to connect their PhD research to their professional field, as Rita explained: "A positive point, very positive, for me, as a high school teacher, is the fact of being able to do the thesis completely connected to my professional practice" (Rita).

Consistently, suggestions for improvement referred to diversifying PhD training purposes, pointing out that such training must prepare candidates not only for research positions but also for professional positions beyond academia. Pedro's statement provided some insights into how these comments were articulated:

> Maybe it is necessary to encourage people to do a PhD not just to get a job as a researcher but to develop other roles outside academia. For example, in many technology-based companies, most bosses, CEOs, or entrepreneurs usually have a PhD. (Pedro)

PhD training structure and conditions

Four categories were created accounting for the participants' comments regarding *the structure and conditions of the PhD training*: *social and career support*; *autonomy*; *funding for training*; and *mobility and networking* (Table 5):

- Social and career support.

Table 5. Structure and conditions of the PhD training

How?	Weaknesses	*N*	Strengths	*N*	Improvement suggestions	*N*
Social and career support	Isolation and lack of training support and career guidance	13	Supervisory guidance and support from the academic community	3	Extended support from the academic community, as well as to regulate the training structure, follow-up and guidance	7
Autonomy	Lack of self-decision and flexible itineraries	3	Leading the research, choosing optative training courses and linking the dissertation to the professional practice	5	Flexible training itineraries, as well as elective and adjusted training to the specific interests of the PhD candidates	2
Funding for training	Difficulties to balance PhD with professional responsibilities	4		0		0
Mobility and networking	Lack of mobility and socialisation opportunities	1	Leading the research, choosing optative training courses and linking the dissertation to the professional practice	2	Academic socialisation and to enhance networking within and outside academia	1

Source: Authors' own creation

The lack of social and career support was mentioned as a weakness by a third of the PhD holders, distributed across all disciplines. Those participants expressed feelings of isolation and inadequate support, often describing themselves as "self-taught" individuals navigating through a process of trial and error to complete the PhD journey. Núria explained different mechanisms she orchestrated to compensate for such lack of support:

> There have also been many things that I have had to work out for myself. From saying, "I have no idea how to use this [data analysis] program" to having to resort to videos and tutorials or trying to find someone to explain it to me. I lived my PhD in a very solitary way (Núria).

Others expressly referred to the lack of career guidance and support for developing their careers. Xavier expressed such disappointment:

> When you get the degree, no advice or career guidance is saying, "Come on, why don't you try this?". […] The first time someone has shown interest and asked me about my post-PhD career is in your study [referring to the interviewer]. This says a lot about what academia is like. Are there career options? Yes, there are, but you have to find them by yourself. (Xavier)

The few who acknowledged receiving appropriate support from supervisors and other academic community members were from humanities and social sciences, such as Reme, who emphasised collaborative support in designing the thesis:

> One of the strengths is that part of the PhD work is thought out in a team; it's designed in a team, although as a PhD candidate, you're the one who's working on the thesis. […] All these [research tasks] are the responsibility of the PhD candidate, not the team. However, the thinking and the design, yes, it is a team effort. That is a strength. (Reme)

Promoting this extended support from the academic community was also suggested as an *improvement* for the PhD journey by participants across disciplines. Notably, they referred to peer support and the creation of communities among PhD candidates not only to foster academic discussions but also to build personal relationships, as Carles pointed out:

> However, now they have improved the PhD Conference in the sense that it has a more fun tone; they go to the beach. When I did it, it was only academic, so you were pressured to speak in public. This made me feel weird. These things must be corrected and designed well. (Carles)

In addition, they also proposed regulating the training structure, follow-up and guidance through the university institution, a start-up or an online advisory service. Paula called for more formative and regulated training, while Lila suggested the idea of an online advisor:

> I am in favour of more formative, more structured guidance during the PhD, instead of open and unstructured PhD training programs where the only requirement is that you do your research under your supervisor's guidance, whatever this means. Because now it depends on the research team you're in, and it shouldn't depend that much on the team you're in. If they accept you, but they don't support you or help you […] (Paula).

> Or maybe a counsellor is needed, no? […] to have a person or a chat to discuss with him; it would be more efficient. (Lila)

- *Autonomy.*

Autonomy was seen as an essential asset for participants, and their comments differed on whether they experienced such autonomy during their PhD training. Most of them, mainly from STEM disciplines, considered that the sense of *autonomy* and independence they experienced enabled them to lead their research, develop a wide range of competencies and skills, explore practical applications and choose what training courses to attend, as stated by Fernando:

> In the academic PhD, where there aren't such established courses and requirements, you're a bit more on your own, which makes you do a wide variety of things. I was very happy with it. It was very useful. (Fernando)

Similarly, Imma valued the *autonomy* her supervisor gave her to link the research to her professional practice: "I think it was the best thing because he [the supervisor] gave me a lot of freedom to do what I wanted to do, and that allowed me to link the research to practical cases" (Imma).

Only two participants, from humanities and social sciences, respectively, regretted not having the autonomy to tailor training to their research interests and thesis topic and, as Hugo, criticised the homogenising vision of their PhD training:

> The PhD starts from the idea that all PhD candidates must finish the same after four years. We begin diverse, but then all of us come out in the same way: with the quantitative, with the qualitative, knowing how to make a research plan, to do a conference presentation, […] Everyone has to go through the same ritual. Why? This completist and uniformitarian vision often makes the PhD experience quite bad. (Hugo)

In line with the above, most participants suggested that PhD training should be flexible enough to tailor to the candidates' interests and needs and link PhD training to professional

practice. That would imply, for instance, offering diverse training itineraries, which would give autonomy of decision to those working in non-academic sectors during their PhD journey, as suggested by Hugo:

> There could be itineraries […] oriented to professional fields and those oriented to the academic field. If the university wants and accepts professionals from outside the academic field, it should empathise with them and have different itineraries. This would allow different intensities and more flexibility (Hugo).

- *Funding for training.*

The *lack of funding for training* was mentioned as a *weakness* for those participants, mainly from social sciences, who did not have a PhD contract or scholarship during their PhD and, thus, experienced difficulties in balancing their studies with their work responsibilities. These difficulties were exemplified by Paula, a social scientist who worked outside academia, but also by Carles, who worked as a laboratory assistant at the university:

> And if I could not [attend training courses], it was more because combining studying with working is always tricky, not because there was no training or because of the team. (Paula)

> Seminars were held, which were very good. But in my case, the problem was that they were always scheduled on the same day at the same time. And many times when I had an experiment, I couldn't attend. (Carles)

- *Mobility and networking.*

Mobility and networking opportunities were less frequently mentioned. Still, they were highlighted as a significant strength for those who experienced it, while others regretted their lack. Reme underscored the significance of international mobility as an opportunity for contrasting and deepening ideas in a different and external context and for fostering networks and collaborations:

> I spent four or five months abroad at a different university. It was wonderful at a content level but also a relational level. That's one of the nice things the doctorate offers you. (Reme, 161)

Among those comments regarding the relevance of *mobility and networking*, it is remarkable that Pablo's suggestion encourages PhD candidates to also network *beyond* academia:

> To create synergies between the professional world and academia […] Suppose you make contacts when you are doing your thesis. In that case, it is much easier to apply the knowledge from the university to the company and apply the company to the university. All this comes from the conferences, moving around, and promoting student mobility. (Pablo)

PhD training competencies and skills

Within the *competencies and skills* dimension, five categories accounted for the participants' comments: *research skills*, *cognitive skills*, *interpersonal skills*, *disciplinary knowledge*, *career planning* and *funding and management skills* (see Table 6). Almost all participants commented on this dimension:

- *Research skills.*

Acquiring *research skills* was mainly identified as a strength by participants across all disciplines, who specifically valued developing advanced research methods and techniques, conducting independent research and generating new knowledge within their respective

Table 6. Competencies and skills of the PhD training

What?	Weaknesses	*N*	Strengths	*N*	Improvement suggestions	*N*
Research skills	Methodology, quantitative methods, publishing and dissemination	5	General acquisition of research skills	7	Training quantitative and innovative research methods	2
Cognitive skills		0	Analytical-critical thinking and complex problem-solving	9	Cross-cutting annual conferences on cognitive skills	1
Interpersonal skills	Communication to wide and diverse audiences and teamwork	4	Communicative consistency, rigor and expertise	4	Training in writing for non-academic genres, as well as for international audiences	2
Career planning	Skills for planning post-PhD careers, and awareness of one's own skills	6		0	A specific subject or seminars in career planning, as well as an individualised post-PhD career guidance	1
Disciplinary knowledge		0	Expertise knowledge	5		0
Funding and management skills	Funding management and leadership	4		0		0

Source: Authors' own creation

fields. The following quote exemplifies this type of comment: "It [PhD training] prepares you for data collection, analysis, individual project management, etc." (Sergi).

However, some social sciences and humanities participants regretted that these methods were not included in their PhD training and were even dismissed by their supervisors and other senior academics. This regret was persistent for quantitative analysis techniques, considered relevant and necessary for their current jobs outside academia. Comments about this weakness were like the following one from Glòria:

> One thing that was lacking in my PhD was the methodological or quantitative analysis part. The professor we had at the time of the PhD course was practically unavailable. Training in those quantitative methods and techniques was scarce, and my thesis director was very passive in this method's part. I always felt a little bit lame. (Glòria, 332)

Suggestions revolved around receiving more training in innovative research methods and incorporating diverse data analysis approaches specific to each discipline. Pablo suggested the inclusion of specialised methodological courses: "Maybe giving some more methodological information. In the sense of "there are these other tools", other than traditional software. Doing specialised courses in social networks' analytics tools, Instagram analytics tools […]" (Pablo):

- *Cognitive skills.*

Cognitive skills, particularly analytical-critical thinking and complex problem-solving, were perceived as a strength of PhD training by most participants across disciplines who considered them easily transferable to different sectors. They pointed out that critical thinking and problem-solving enabled them to identify challenges, approach complex problems critically and propose innovative solutions in broader contexts. The following quote from Pablo illustrates the perceived relevance of these competencies: "Many times, things are done a little bit superficially, and the PhD gives you the capacity for deep analysis. Assuming responsibilities and being persistent, to know how to analyse a problem and how to deal with it" (Pablo). Moreover, Aina stressed the transferable nature of these skills:

> I have developed the capacity for critical analysis, which is good because sometimes we get caught up in the superficiality of things. In my work, we also need people with a critical sense, people with the ability to reflect and go a little further. And I think a person with a PhD can bring that vision and that depth, even beyond the academic. (Aina).

In accordance with this, Nina from Social Sciences also stressed the importance of developing cognitive skills "instead of excessively burdening the PhD curriculum" (Nina):

- *Interpersonal skills.*

Interpersonal skills, encompassing communication and teamwork skills, were considered both strengths and weaknesses depending on the particular aspects emphasised. Some participants, across disciplines, highlighted the development of robust academic writing skills during their PhD training. They articulated how their training helped them to increase writing clarity and accuracy, as evidenced by Alex's reflection: "I think it has helped me a lot. To not ramble. To be clear and to write what you want to say concisely, and not to give rise to possible misinterpretations and misunderstandings" (Alex).

Conversely, some participants, mainly from STEM disciplines, expressed dissatisfaction with the narrow focus of their writing training, which predominantly focused on scientific article composition. They lamented the lack of preparation for communicating effectively, both orally and in writing, to broader audiences beyond academia. Sergi shared an anecdote that highlighted the deficiency in oral communication skills when faced with a wider audience in a non-academic professional context:

> The last mass oral communication that I did was with [my supervisor], right? And we had an audience that […] They told us that 300 or 400 people were coming. We were there, and they were putting us on the earpiece, and I said, '[supervisor], you don't prepare for these things at the university'. (Sergi, 40)

In addition, Fernando mentioned difficulties in acquiring specific collaborative communication skills during his STEM PhD:

> When I came here [current job], I tried to do a lot of things on my own. And it's impossible, you know, and you need an organisation. Some people are dedicated to one thing, one to another. Tasks are more distributed. That makes the work a lot easier, but you must also communicate a lot better. And it really meant that I wasn't used to working in a team. That is a major shortcoming of my PhD, as well as other PhDs. (Fernando)

Improvement suggestions revolved around the need for more training in writing for non-academic genres as well as for international audiences. According to Gala, effective writing skills and competencies are essential to address diverse audiences in professional careers: "We need a broader perspective on the competencies we need to develop. We give significant

importance to communication, specifically in writing scientific papers. However, individuals outside of academia produce various forms of written work" (Gala):

- *Career planning.*

Regrets regarding insufficient training *in career planning*, especially considering requisites, tips and strategies for pursuing careers within and beyond academia, came from participants across disciplines. They felt unequipped to apply for post-PhD academic grants and navigate their careers beyond academia, as Xavier stated: "Zero preparation or information on what types of work you can do with a PhD […] Possibly there should be some courses or some information sessions on what to do when you finish your PhD I have never seen something as simple as this" (Xavier).

Interestingly, the lack of awareness and reflection on their formative process, especially regarding transversal and interpersonal competencies, was also mentioned as a *weakness* in *career planning skills* by one participant, Gloria, who explained:

> Many candidates do not know that they are doing team management [during their PhD]. Many ends up doing it; they end up working in a network with other people. They have interactions with many interdisciplinary networks […]. Even if we don't realise it, we learn it, and it happens. We need to be made a little more aware that we are learning it. (Gloria)

- *Disciplinary knowledge.*

Disciplinary knowledge was considered a *strength* only by those participants across disciplines who acknowledged this knowledge as relevant in their current jobs. For these participants, becoming experts in their respective disciplines significantly enhanced their professional practice. Kevin, who did a PhD in education and was a high school teacher, exemplified the impact of the PhD on improving his professional capabilities: "It gives me a vision that is not only praxis. For me, the PhD is intensive training for what I do. It gives me tools, possibilities, and perspectives in seeing things. It is fundamental. (Kevin):

- *Funding and management skills.*

Similarly, the lack of training *in funding and management skills* was mentioned as a *weakness* for those working in environments where these skills were valued and required. They mentioned being poorly -or not at all trained in skills for funding management and leadership, as Mona criticised:

> The fact that you are an expert, that you are a scientist, that you are like, "the intelligent one" […], doesn't mean that you cannot also, at some point, see the big picture, manage, lead, organise […] I think this is crucial, I would have loved to learn it during my PhD (Mona).

Discussion

This study focused on how Spanish PhD holders working outside academia perceive and value their past PhD training experiences within academic PhD programs. Specifically, we looked at how they explained and appraised the characteristics of their PhD training regarding its purposes, structure and conditions and skills and competencies. Moreover, we also analysed any suggestions for improvement regarding the PhD training they provided when relating their PhD training to the required competencies and skills in their current job.

The results disclosed that Spanish PhD holders developing non-academic careers while navigating diverse, complex and uncertain environments experienced contradictions and tensions in assessing the purposes of their PhD training. These tensions echo previous

research findings over the last decade (Castelló *et al.*, 2023; Guccione and Bryan, 2023; Hancock and Walsh, 2016). Generally, participants felt that their PhD training was overly oriented towards academia, limiting its applicability to other sectors. However, a more nuanced analysis reveals significant insights.

From their non-academic roles, many participants considered the academic emphasis of their training to be a drawback. Yet, those employed in research-related jobs, particularly in STEM disciplines, viewed the research-oriented focus of their PhD training as a valuable asset in their current roles. Conversely, most participants in non-research-related jobs – such as managerial positions – felt that their training did not align well with the practical demands of their roles and did not adequately prepare them for the knowledge transfer required in the labour market. The notable exceptions were those few who had the opportunity to conduct their theses in specific work environments, who, presumably, were already equipped with the necessary skills for effective knowledge transfer.

These findings highlight an apparent dichotomy: PhD holders in Spain in non-academic settings with research responsibilities versus those in highly skilled but non-research-oriented jobs. This division also resonates with recent insights into the complex interplay between various domains – such as career achievements and employer perspectives – that shape individuals' perceptions of the value of a PhD (Guccione and Bryan, 2023). Moreover, the broader structural contexts, such as labour sector and organisational influences, play significant roles in defining work specifications and shaping the actual work experience (McAlpine and Castelló, 2024).

Our results also reveal an underlying framework of implicit objectives within academic PhD training programs in Spain. These programs frequently establish a sharp boundary between academic pursuits and non-academic sectors, as well as between research-focused and other professional competencies (Carter *et al.*, 2018; Sarrico, 2022). To mitigate the tensions arising from these divisions, some participants advocate for a cultural shift that balances academic and non-academic pathways, connecting PhD programs more closely with societal issues. This approach aligns with RRI principles, which emphasise inclusive, sustainable research involving diverse stakeholders (Kovačević *et al.*, 2022; Mejlgaard *et al.*, 2019).

The findings also challenge the conditions of participants' PhD training. They highlighted the need for extended support networks, emphasising that these should foster not only research collaboration but also professional development and transition into non-academic careers (Germain-Alamartine *et al.*, 2021). This evidence suggests that moving towards personalised, open and flexible PhD training models may be crucial for those pursuing careers outside academia, coupled with favourable views on autonomy and freedom (Merga and Mason, 2021).

Notably, among the critical skill gaps identified, the ability to effectively communicate with diverse audiences is particularly prominent. While the OECD (2013) report underscores the societal value of PhDs, emphasising both research conduct and information dissemination, recent evidence suggests a predominant emphasis on effective communication in many non-academic PhD careers (McAlpine and Castelló, 2024). This result accentuates the significance and often-overlooked nature of the prevalent communication modes and genres in such contexts. Our findings provide evidence –not present in previous studies- that PhD holders might perceive themselves as ill-prepared to engage with genres and audiences beyond academia. However, this perceived inadequacy may be due to the invisibility and occluded nature of some genres and communication modes. It remains unclear whether and how PhD training contributes to developing the underlying skills required in some communication modes -i.e. dialogue and oral argumentation- given the hybrid and occluded nature of some of those tasks during the PhD journey. In essence, without explicitly emphasising genre

awareness and communication modes in PhD training, students may struggle to grasp the nuanced overlaps in reading, speaking and writing inherent in their academic endeavours.

Our findings also prove that Spanish PhD holders transitioning to non-academic careers recognise the value of specific academic research-related, transversal and interpersonal skills within non-academic professional environments. This contribution complements previous insights into employers' appreciation of these skills (Lam, 2007; McAlpine and Inouye, 2021; McAlpine and Castelló, 2024), enabling us to argue that promoting critical reflection on how the expectations of PhD candidates intersect with their training choices and opportunities can be crucial to unveiling skill and capability transfer opportunities required in non-academic settings.

The study is not without limitations. While the results offer an informative overview of the perceived impact of academic PhD training on non-academic jobs from the PhD holders' perspective in Spain, it is essential to acknowledge that the chosen research design did not allow for exploring variation in PhD training across different disciplines. It is conceivable that a more comprehensive analysis, incorporating details about the specific PhD programs and research cultures within the participant's respective fields, might have yielded diverse findings, affording a more nuanced understanding of the distinct characteristics inherent to each discipline and the potential divergences among them. Still, we consider the evidence presented, even in the form of aggregated results, to be a pioneering contribution to enhancing PhD programs.

Looking to the future and informed by our findings, there is a compelling need for PhD education to evolve continually, adapting to the dynamic demands of an ever-changing knowledge landscape. Importantly, insights from PhD holders employed in diverse non-academic environments are crucial to identifying these varied contexts' critical constraints and needs. Such understanding is essential for equipping the next generation of researchers with the skills and mindset necessary to drive ethical, impactful and sustainable advancements in our societies, both within and beyond academic environments:

- While various approaches classify and conceptualise skills and competencies included in PhD training (Mantai and Marrone, 2022), in this study, we used the framework developed and adopted by European institutions (Weber *et al.*, 2018; European Commission, 2019). Thus, we accepted the most general and commonly accepted distinction between specific competencies, those referring to a specific field of knowledge (e.g. disciplinary skills), and transversal transferable competencies, including those learned in one context that are useful for another (e.g. interpersonal, cognitive, digital and communication skills among others); and
- Industrial doctorates in Spain are PhD programs designed to prepare professionals in specific fields for leadership roles and applied research in their respective industries. These programs include all the disciplinary fields and blend academic coursework with practical, industry-focused research, allowing candidates to develop highly relevant expertise to their professional careers. They do not result in a separate degree, but in a mention within the unique PhD degree offered by the Spanish Universities.

Note

1. Interview protocol available at www.researcher-identity.com/single-post/ecrid-interview-protocol

References

AQU (2020), "La inserció laboral dels doctors i doctores de les universitats catalanes [2020 the labor market insertion of doctors and PhDs from Catalan universities]", available at: www.aqu.cat/doc/doc_69542234_1.pdf (accessed 7 December 2023).

Barnett, R. (2006), "Graduate attributes in an age of uncertainty", in Hager, P. and Holland, S. (Eds), *Graduate Attributes, Learning and Employment*, Springer, Drodrecht, pp. 49-65.

Barry, K.M., Woods, M., Warnecke, E., Stirling, C. and Martin, A. (2018), "Psychological health of doctoral candidates, study-related challenges and perceived performance", *Higher Education Research and Development*, Vol. 37 No. 3, doi: 10.1080/07294360.2018.1425979.

Bettencourt, G.M., Wells, R.S., Auerbach, S.M., Fermann, J.T. and Kimball, E. (2023), "How STEM undergraduates choose, navigate, and integrate interdisciplinarity in college and Beyond", *The Journal of Higher Education*, Vol. 94 No. 2, pp. 174-199.

Borrel-Damian, L., Morais, R. and Smith, J.H. (2015), "Collaborative doctoral education in Europe: research partnerships and employability for researchers", Report on DOC-CAREERS II Project, European University Association, available at: https://eua-cde.org/downloads/publications/2015_borrell-damianl_collaborative-doctoral-doc-ii-project.pdf (accessed 7 December 2023).

Braun, V. and Clarke, V. (2020), "One size fits all? What counts as quality practice in (reflexive) thematic analysis?", *Qualitative Research in Psychology*, Vol. 18 No. 3, pp. 328-352, doi: 10.1080/14780887.2020.1769238.

Braun, V. and Clarke, V. (2022), "Toward good practice in thematic analysis: Avoiding common problems and be(com)ing a knowing researcher", *International Journal of Transgender Health*, Vol. 24 No. 1, pp. 1-6, doi: 10.1080/26895269.2022.2129597.

Carter, J., Smith, E.F. and Gelves-Gomez, F. (2018), "Doctoring knowledge or acknowledging doctors?", *Geographical Research*, Vol. 56 No. 4, doi: 10.1111/1745-5871.12305.

Castelló, M., García-Morante, M., Díaz, L., Sala-Bubaré, A. and Weise, C. (2023), "Doctoral trends development in Spain: from academic to professional paths", *Innovations in Education and Teaching International*, Vol. 60 No. 5, pp. 736-747, doi: 10.1080/14703297.2023.2237958.

Cuthbert, D. and Molla, T. (2015), "PhD crisis discourse: a critical approach to the framing of the problem and some Australian 'solutions", *Higher Education*, Vol. 69 No. 1, pp. 33-53, doi: 10.1007/s10734-014-9760-y.

Durette, B., Fournier, M. and Lafon, M. (2016), "The core competencies of PhDs", *Studies in Higher Education*, Vol. 41 No. 8, pp. 1355-1370, doi: 10.1080/03075079.2014.968540.

Elliot, D.L., Bengtsen, S. and Guccione, K. (2023), *Developing Researcher Independence Through the Hidden Curriculum*, Palgrave Macmillan, Cham, ISBN, pp. 978-973.

European Commission (2019), "Key competencies for lifelong learning. Directorate-general for education, youth, sport and culture", Publications Office, available at: https://data.europa.eu/doi/10.2766/569540 (accessed 7 December 2023).

Germain-Alamartine, E., Ahoba-Sam, R., Moghadam-Saman, S. and Evers, G. (2021), "Doctoral graduates' transition to industry: networks as a mechanism? Cases from Norway, Sweden and the UK", *Studies in Higher Education*, Vol. 46 No. 12, pp. 2680-2695, doi: 10.1080/03075079.2020.1754783.

Guccione, K. and Bryan, B. (2023), "Worth doing but not worth having? The influence of personal aspirations and career expectations on the value of a doctorate", *Studies in Graduate and Postdoctoral Education*, Vol. 14 No. 1, pp. 83-98, doi: 10.1108/SGPE-02-2022-0012.

Hancock, S. and Walsh, E. (2016), "Beyond knowledge and skills: rethinking the development of professional identity during the STEM doctorate", *Studies in Higher Education*, Vol. 41 No. 1, pp. 37-50, doi: 10.1080/03075079.2014.915301.

Hayter, C.S. and Parker, M.A. (2019), "Factors that influence the transition of university postdocs to non-academic scientific careers: an exploratory study", *Research Policy*, Vol. 48 No. 3, pp. 556-570, doi: 10.1016/j.respol.2018.09.009.

Herrera, L. and Nieto, M. (2016), "PhD careers in Spanish industry: job determinants in manufacturing versus non-manufacturing firms", *Technological Forecasting and Social Change*, Vol. 113, pp. 341-351, doi: 10.1016/j.techfore.2015.09.019.

Horta, H. (2018), "PhD students' self-perception of skills and career plans while in doctoral programs: Are they associated?", *Asia Pacific Education Review*, Vol. 19 No. 2, pp. 211-228, doi: 10.1007/s12564-018-9532-y.

Jung, J. (2018), "Learning experience and perceived competencies of doctoral students in Hong Kong", *Asia Pacific Education Review*, Vol. 19 No. 2, doi: 10.1007/s12564-018-9530-0.

Kovačević, M., Bitušíková, A. and Dagen, T. (2022), "Emergence of current European thinking and policies on doctoral education", *European Journal of Education*, Vol. 57 No. 3, doi: 10.1111/ejed.12515.

Kyvik, S. and Olsen, T.B. (2012), "The relevance of doctoral training in different labour markets", *Journal of Education and Work*, Vol. 25 No. 2, doi: 10.1080/13639080.2010.538376.

Lam, A. (2007), "Knowledge networks and careers: Academic scientists in industry–university links", *Journal of Management Studies*, Vol. 44 No. 6, pp. 993-1016, doi: 10.1111/j.1467-6486.2007.00696.x.

McAlpine, L. and Inouye, K. (2021), "What value do PhD graduates offer? An organisational case study", *Higher Education Research and Development*, Vol. 41 No. 5, pp. 1648-1663, doi: 10.1080/07294360.2021.1945546.

McAlpine, L. and Castelló, M. (2024), "What do PhD graduates in non-academic careers actually do? Interaction between organisation mission, job specifications and graduate lived experience", *Learning and Teaching*, Vol. 17 No. 1, pp. 77-106, doi: 10.3167/latiss.2024.170105.

Maldonado, V. (2013), "En quête d'un doctorat? So you want to earn a PhD?: the attraction, realities, and outcomes of pursuing a doctorate", Conseil ontarien de la qualité de l'enseignement supérieur. Ottawa, Ontario, available at: https://policycommons.net/artifacts/1231121/en-quete-dun-doctorat/1784193/ (accessed 7 December 2023).

Mantai, L. (2017), "Feeling like a researcher: experiences of early doctoral students in Australia", *Studies in Higher Education*, Vol. 42 No. 4, pp. 636-650, doi: 10.1080/03075079.2015.1067603.

Mantai, L. and Marrone, M. (2022), "Identifying skills, qualifications, and attributes expected to do a PhD", *Studies in Higher Education*, Vol. 47 No. 11, doi: 10.1080/03075079.2022.2061444.

Mars, M.M. and Moravec, B.G. (2022), "PhD students as boundary spanning agents: an exploration of student values, goals, and agency in the era of cross-sector permeation", *Studies in Graduate and Postdoctoral Education*, Vol. 13 No. 2, pp. 205-220, doi: 10.1108/SGPE-08-2021-0057.

Mejlgaard, N., Bloch, C. and Madsen, E.B. (2019), "Responsible research and innovation in Europe: a cross-country comparative analysis", *Science and Public Policy*, Vol. 46 No. 2, doi: 10.1093/scipol/scy048.

Merga, M. and Mason, S. (2021), "Doctoral education and early career researcher preparedness for diverse research output production", *Journal of Further and Higher Education*, Vol. 45 No. 5, pp. 672-687, doi: 10.1080/0309877X.2020.1807477.

Mowbray, S. and Halse, C. (2010), "The purpose of the PhD: theorising the skills acquired by students", *Higher Education Research and Development*, Vol. 29 No. 6, pp. 653-664, doi: 10.1080/07294360.2010.487199.

Nyquist, J.D. and Woodford, B.J. (2000), "Re-envisioning the Ph. D.: what concerns to we have?", University of Washington, Seattle, available at: http://depts.washington.edu/envision/resources/ConcernsBrief.pdf (accessed 7 December 2023).

OECD (2013), *Education at a Glance 2013: OECD Indicators*, OECD Publishing, Paris, doi: 10.1787/eag-2013-en.

Passaretta, G., Trivellato, P. and Triventi, M. (2019), "Between academia and labour market" "the occupational outcomes of PhD graduates in a period of academic reforms and economic crisis", *Higher Education*, Vol. 77 No. 3, pp. 541-559, doi: 10.1007/s10734-018-0288-4.

Pérez, L.D., Ordóñez, J.L. and Araya, D.R. (2021), "Impacto del doctorado: formación y realidad laboral de los egresados", *REOP – Revista Española de Orientación y Psicopedagogía*, Vol. 32 No. 3, pp. 41-59, doi: 10.5944/reop.vol.32.num.3.2021.32555.

Platow, M.J. (2012), "PhD experience and subsequent outcomes: a look at self-perceptions of acquired graduate attributes and supervisor support", *Studies in Higher Education*, Vol. 37 No. 1, pp. 103-118, doi: 10.1080/03075079.2010.501104.

Rönkkönen, S., Tikkanen, L., Virtanen, V. and Pyhältö, K. (2023), "The impact of supervisor and research community support on PhD candidates' research engagement", *European Journal of Higher Education*, Vol. 14 No. 4, doi: 10.1080/21568235.2023.2229565.

Sala-Bubaré, A., Garcia-Morante, M., Castelló, M. and Weise, C. (2024), "PhD holders' working conditions and job satisfaction in Spain: a cross-sector comparison", *Higher Education Research and Development*, Vol. 43 No. 7, pp. 1-15, doi: 10.1080/07294360.2024.2347611.

Sarrico, C.S. (2022), "The expansion of doctoral education and the changing nature and purpose of the doctorate", *Higher Education*, Vol. 84 No. 6, pp. 1299-1315, doi: 10.1007/s10734-022-00946-1.

Taylor, S. (2023), "The changing landscape of doctoral education: a framework for analysis and introduction to the special issue", *Innovations in Education and Teaching International*, Vol. 60 No. 5, pp. 606-622, doi: 10.1080/14703297.2023.2237962.

Valeeva, E., Ziyatdinova, J. and Galeeva, F. (2020), "Development of soft skills by doctoral students", in Auer, M., Hortsch, H. and Sethakul, P. (Eds) *The Impact of the 4th Industrial Revolution on Engineering Education. ICL 2019. Advances in Intelligent Systems and Computing*, Vol. 1135, Springer, Cham, doi: 10.1007/978-3-030-40271-6_17.

Weber, C.T., Borit, M., Canolle, F., Hnatkova, E., O'Neill, G., Pacitti, D. and Parada, F. (2018), *Identifying and Documenting Transferable Skills and Competences to Enhance Early Career Researchers Employability and Competitiveness*, European Council of Doctoral Candidates and Junior Researchers, Brussels, doi: 10.5281/zenodo.1299178.

Further reading

Germain-Alamartine, E. and Moghadam-Saman, S. (2019), "Aligning doctoral education with local industrial employers' needs: a comparative case study", *European Planning Studies*, Vol. 28 No. 2, pp. 234-254, doi: 10.1080/09654313.2019.163740.

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