

# Career Preparedness: The role of Experience before a PhD

Maria Cadilhe<sup>1,2\*</sup>, Beatriz Almeida<sup>1</sup>, Ana I. Rodrigues<sup>1</sup> and Marta Santos<sup>1,2</sup>

<sup>1</sup>Faculty of Psychology and Education Sciences, University of Porto, Portugal

<sup>2</sup>Center for Psychology, Faculty of Psychology and Education Sciences, University of Porto, Portugal

\*Correspondence: [mariacadilhe@fpce.up.pt](mailto:mariacadilhe@fpce.up.pt)

## Abstract:

OECD-wide the number of PhD holders has been growing every year, but the job opportunities in the Higher Education Sector, as their privileged employer, do not seem to keep up with PhD holders' numbers. This scenario paired with the current shifts in career trends may intensify the pressure on PhD students while considering the development of their future career paths. Past work experiences are a central aspect in the career development paradigm, but there seems to be a scarcity of information about PhD students' professional experiences prior to their enrolment in the PhD. In this sense, this study aimed to explore the extent to which previous professional experiences determine PhD students' feeling of preparedness to act on their career development. Quantitative research was conducted involving 377 Portuguese PhD students, with the objective of analysing students' perception of preparedness to conduct actions related to their career development. Findings identify that PhD students with more diverse past professional experiences, report a greater capacity for reflection both on the labor market and on themselves for the development of their career, than PhD students with past professional experience exclusively in Academia or with no professional experience. This study confirms that having diverse past professional experiences seems to contribute to a greater sense of preparedness to act upon career development, which can be essential when transversal career trends are changing towards less linear and less homogeneous paths.

**Keywords:** PhD students; career development; professional experience; employability challenges.

## 1 Introduction

### 1.1 What do we know about PhD holders and PhD students?

PhD holders are a population that made a career investment to pursue a specialized degree which has witnessed a rise in their numbers in OECD countries (OECD, 2019; WEF, 2019). Similarly, in Portugal, the number of PhD students has been increasing exponentially, from 3.381 in 2000 to 21.763 students in 2020 spread throughout the country (DGEEC, 2020).

How do they enrol in the PhD? Compared to other OECD countries, Portuguese students tend not to enrol before the age of 30 in the PhD (OECD, 2019), which suggests these students may value opportunities to work before the PhD, that they can later take advantage of during their research at the PhD (OECD, 2019). But information about their career paths seems to be missing, as there is a scarcity of information regarding PhD students' professional experience background on nationwide reports that can provide insights into the types of work experiences students may be developing before enrolling in the PhD. In short, we do not know where these students are in terms of their professional experience before entering the PhD.

### 1.2 What do we know about PhD holders' employability?

PhD holders' employability is characterized by a very high employment rate (over 90% in both OECD and Portugal (OECD, 2021)). Considering their careers, Higher Education Institutions (HEI) have been PhD holders' traditional career destination (DGEEC, 2021; Eurostat, 2017; OECD, 2019), particularly in research-related positions. This is also the reality in Portugal, where HEIs are PhD holders' main employers, with 77% working in an HEI, whereas in contrast, 8% can be found working at the Private Sector (DGEEC, 2021).

Due to their high employment rate observed so far, the employability of PhD holders does not seem to imply any challenges to the career development of this population. Conversely, an analysis of the characteristics of this employment, reveals implicit challenges to the PhD holders' career paths. As a sector that seems to not tend to expand or renew itself rapidly, Academia offers limited opportunities for long-term employment to PhD holders (der Boon et al., 2018; Fuhrmann et al., 2011; Kim et al., 2018; Sherman et al., 2021). This scenario can also be impacted by the growing number of PhD students (DGEEC, 2020; OECD, 2019; WEF, 2019), as Academia will not be able to integrate the growing number of graduates. While at the same time, the available job opportunities are often characterized by precarious work conditions (e.g., short-term employment) (Fuhrmann et al., 2011; Kim et al., 2018; Thiry et al., 2015; Sauermann & Roach, 2012). In Portugal, this critic situation is reflected by recent news, where PhD holders working in national HEIs are not able to keep stable employment (Valente, 2023). In the scope of this reality, PhD holders' and students' employability more than ever represents a need for research and intervention.

### **1.3 What do we know about careers?**

The career development paradigm centres the need to expand knowledge to make career related choices (Bersin & Sanders, 2019; Coimbra et al., 1994; Lent & Brown, 2021; Savickas, 2021). In the case of PhD holders and students, this gains particular importance due to their highly specialized profile that can contribute to innovation and development of different sectors (Afonja et al., 2021). This way, promoting PhD students career development can be seen as enhancing their future contributions as graduates to society (Afonja et al., 2021).

Although facing a specific challenge, addressing the employability of PhD holders cannot be done without positioning this challenge within the current transversal shifts in employability trends and careers, which in turn, support the change in the paradigm of vocational and professional development (Savickas et al., 2009). A development which highlights the importance of flexibility in career decision-making (Callanan et al., 2017), derived from the rapid demographic reconfigurations and contextual transformations (Volkoff, 2011) and from the conceptualization of careers as multidirectional projects, in alternative to the paradigm of a linear career throughout life (Baruch, 2004) – a trend that is important to keep in mind when considering career development.

### **1.4 What do we know about work experience and career development?**

Career development can be understood as a social process supported on the individual-context interactions (Savickas, 2021), with a particular focus on the opportunities the latter

provides to one's development (Coimbra et al., 1994). It is then fundamental to experience diverse work situations, contexts, and career exploration activities and actions, to ensure a significant number of recognized possibilities for the development and planning of one's own career path (Bersin & Sanders, 2019; Percy & Kashefpakdel, 2018; Zhang et al., 2022).

Within this scope, the power to act, as a process by which individuals, gain greater possibility to act on what is important to them (Le Bossé, 2011), makes particular sense when paired with the role of work experiences for career development. Hence, it becomes relevant to focus on the value of past work experiences as a resource that can be taken advantage of by PhD students for their career development preparation.

### **1.5 What do we not know?**

There seems to be a scarcity of studies that consider PhD students' past professional experience and how it relates to their career development. Studies (Stehlik, 2011; Templeton, 2021) that consider the students' past work experience approach the PhD as a peak point of the students' career, leaving little to no insights into their career construction.

Reflecting on the employability challenge of PhD holders, the relevance of work experience for career development (Bersin & Sanders, 2019; Coimbra et al., 1994; Lent & Brown, 2021; Ouvrier-Bonnaz & Vérillon, 2002; Savickas, 2021), and the scarcity of studies on this experience in the career development of PhD students, our research question aims to understand if PhD students with diverse professional experiences will feel more prepared to develop career development actions than the students with less diverse work experience backgrounds.

## **2 Method**

### **2.1 Participants and data collection**

An exploratory quantitative study was conducted, with data collection occurring over the course of 1 month, from October to November 2021. A questionnaire was sent via e-mail through HEIs' Employability Services to PhD students. A total of 377 complete responses were used for analysis. The demographic characteristics of the sample are presented in **Table 1**. Considering the students' professional experience, which comprehends the groups of analysis of the study, four types of professional experience were identified: "Exclusively in the Academia context" (29.2%,  $N = 110$ ); "Exclusively in the Corporate context (21.0%;  $N = 79$ ); "In more than one context (Academia, Corporate and/or Public Administration) (42.4%;  $N = 160$ ); and "No professional experience" (7.4%;  $N = 28$ ).

**Table 1***Participants' demographic information (N = 377)*

Background statistics		Proportion (%)	N
Gender	Male	43.5	162
	Female	56.5	210
Age	20 to 29 years old	52.3	197
	30 to 39 years old	30.5	115
	40 or more years old	17.2	65
Field of study	Engineering and Technology Sciences	28.0	105
	Medical and Health Sciences	24.3	91
	Social Sciences	22.4	84
	Natural and Exact Sciences	13.6	51
	Arts and Humanities	11.7	44

## 2.2 Measures and data analysis

The questionnaire was developed specifically for this study, based on interviews with Higher Education stakeholders, that were involved due to their positions in the context which were related to the scope of analysis. This decision was supported by the difficulty of identifying a scale that approached the past work experience dimension. A total of 13 questions were included, aimed at assessing the students' perceptions about their preparedness to conduct career development actions, such as, among other items: identify experiences and goals; ability to outline actions for the design of their career path; and confidence to achieve their professional goals. Items were presented on a Likert scale, from 1 ("strongly disagree") to 5 ("strongly agree").

IBM SPSS Statistics 27 was used to analyse if there were significant differences on the students' perceptions of preparedness to take career development actions according to their professional experience. Non-parametric tests were used since the professional groups had different sizes and items did not follow a normal distribution ( $W(376) = 0.76$  to  $0.91$ ,  $p < .001$ ).

## 3 Results and Implications

The Kruskal-Wallis test used to analyse if there were differences among the students with different professional experience on their perceptions of preparedness for career development actions, found significant differences on six of the items:

- "I can identify the skills I have developed through my academic, professional, personal, social and family experiences throughout my life" ( $H(3) = 11.97$ ,  $p = .007$ );
- "I feel I have the necessary skills to enter the labor market in my area of training and/or interest" ( $H(3) = 12.59$ ,  $p = .006$ );
- "I feel able to identify the purpose I want to achieve through my work" ( $H(3) = 15.85$ ,  $p = .001$ );
- "I feel prepared to start a research/professor position in Academia after the PhD" ( $H(3) = 10.11$ ,  $p = .018$ );
- "I am able to outline an action plan to reach my career goals" ( $H(3) = 8.29$ ,  $p = .040$ );
- "I feel prepared to start a position in Public Administration after the PhD" ( $H(3) = 21.11$ ,  $p < .001$ ).

Pairwise comparisons using Bonferroni identified significant differences on five of the six items (**Tables 2, 3, 4, and 5**). These results seem to identify that PhD students with more diverse past work experiences present a higher sense of preparedness to build their career development proposition, reporting a greater capacity for reflection both on the labor market and on themselves, than the students with less diverse work experiences, especially the students with no professional experience and those with experience exclusively in Academia.

**Table 2**

*Differences between the students with professional experience in Academia and the students with experience in more than one context*

	Exclusively in Academia		In more than one context		Significance
	Mean	SD	Mean	SD	<i>p.</i>
I can identify the skills I have developed through my academic, professional, personal, social and family experiences throughout my life	4.04	.63	4.26	.66	.015
I feel I have the necessary skills to enter the labor market in my area of training and/or interest	3.87	.84	4.18	.75	.015

**Table 3**

*Differences between the students with no professional experience and students with experience in more than one context*

	No professional experience		In more than one context		Significance
	Mean	SD	Mean	SD	<i>p.</i>
I am able to outline an action plan to reach my career goals	3.11	.91	3.59	.99	.035

**Table 4**

*Differences between the students with no professional experience and professional experience on Academia with the students with experience in more than one context*

	No professional experience		Exclusively in Academia		In more than one context		Significance
	Mean	SD	Mean	SD	Mean	SD	<i>p.</i>
I feel able to identify the purpose I want to achieve through my work	3.68	.72	-	-	4.10	.73	.045
	-	-	3.77	.86			.011

**Table 5**

*Between the students with no professional experience and the students from all professional experience groups*

	No professional experience		Exclusively in Academia		Exclusively in Corporate		In more than one context		Significance
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	<i>p.</i>
	2.68	.90	3.33	1.06	-	-	-	-	.015

I feel prepared to start a position in Public Administration after the PhD	-	-	3.57	1.15	-	-	<.001
	-	-	-	-	3.56	.98	<.001

Through these results, the importance of exploring all gained opportunities for career development (Coimbra et al., 1994; Delors et al., 1996; Zhang et al., 2022) is highlighted, by promoting the development of these students, that translates into their capacity to plan and develop their future career paths (Savickas, et al., 2009; Zhang et al., 2022). In this scope, the diversity of past work experiences also seems to be providing more opportunities to expand the students' self-knowledge for career development preparedness, which, as Greenhaus and colleagues (2010) identify, can contribute for the construction of more productive and satisfactory career paths.

#### 4 Conclusion

In the face of the current career trends, the possibility for students to be able to self-reflect upon their value proposition, and thus develop their power to act to construct their future career, can be decisive when career trends are changing towards less linear and less homogeneous paths (Savickas et al., 2009). The present findings support that, as a way of doing so, having past work experiences is essential for career development (Bersin & Sanders, 2019; Percy & Kashfepakdel, 2018; Zhang et al., 2022). In the sense these experiences can act to expand the range of known career related choices one can make (Coimbra et al., 1994), and thus contribute for development through a greater sense of preparedness to act upon their career development, as shown by this study results.

#### 5 References

- Afonja, S., Salmon, D. G., Quaily, S. I., & Lambert, W. M. (2021). Postdocs' advice on pursuing a research career in academia: A qualitative analysis of free-text survey responses. *PloS one*, 16(5), <https://doi.org/10.1371/journal.pone.0250662>
- Baruch, Y. (2004). Transforming careers: from linear to multidirectional career paths: organizational and individual perspectives. *Career Development International*, 9(1), 58-73.
- Bersin, J., & Sanders, Z. (2019). Making Learning a Part of Everyday Work. *Harvard Business Review*. <https://hbr.org/2019/02/making-learning-a-part-of-everyday-work>
- Callanan, G., Perri, D., & Tomkowicz, S. (2017). Career Management in Uncertain Times: Challenges and Opportunities. *The Career Development Quarterly*, 65, 353-365. <https://doi.org/10.1002/cdq.12113>
- Coimbra, J. L., Campos, B. P., & Imaginário, L. (1994). *Career intervention from a psychological perspective: Definition of the main ingredients of an ecological-developmental methodology*. Paper presented at the 23<sup>rd</sup> International Congress of Applied Psychology (Madrid).
- Delors, J., Al-Mufti, I., Amagi, I., Carneiro, R., Chung, F., Geremek, B., ... & Nanzhao, Z. (1996). *Educação: um tesouro a descobrir*. Relatório para a UNESCO da Comissão Internacional sobre Educação para o século XXI. Cortez Editora.

- der Boon, J., Kahmen, S., Maes, K., & Waaijer, C. (2018). *Delivering talent: Careers of researchers inside and outside academia*. League of European Research Universities (LERU).
- DGEEC. (2020). Estatísticas da Direção-Geral de Estatísticas da Educação e Ciência. <https://www.dgeec.mec.pt/np4/18/>
- DGEEC. (2021). Inquérito aos Doutorados – CDH20 – Resultados Provisórios. Lisboa: Direção-Geral de Estatísticas da Educação e Ciência (DGEEC).
- Eurostat. (2017). Archive: Careers of PhD holders. [https://ec.europa.eu/eurostat/statisticsexplained/index.php?title=Archive:Careers\\_of\\_PhD\\_holders](https://ec.europa.eu/eurostat/statisticsexplained/index.php?title=Archive:Careers_of_PhD_holders)
- Fuhrmann, C. N., Halme, D. G., O'Sullivan, P. S., & Lindstaedt, B. (2011). Improving graduate education to support a branching career pipeline: recommendations based on a survey of doctoral students in the basic biomedical sciences. *CBE Life Sciences Education*. 10(3), doi: 10.1187/cbe.11-02-0013
- Greenhaus, J. H., Callanan, G. A., & Godshalk, V. M. (2010). *Career management* (4th ed.). Sage Publications, Inc.
- Kim, E., Benson, S. & Alhaddab, T.A. (2018). A career in academia? Determinants of academic career aspirations among PhD students in one research university in the US. *Asia Pacific Education Review*, 19(2), <https://doi.org/10.1007/s12564-018-9537-6>
- Le Bossé, Y. (2011). *Psychologie des sciences de l'orientation: un point de vue interactionniste et stratégique*. Editions Ardis.
- Lent, R., & Brown, S. (2021). Career Development and Counseling: An Introduction. In R. Lent & S. Brown (Eds.), *Career Development and Counseling: Putting Theory and Research to Work* (pp. 28-62). John Wiley & Sons, Inc.
- OECD. (2019). Education at a Glance 2019: OECD Indicators. OECD Publishing. <https://doi.org/10.1787/f8d7880d-en>.
- OECD. (2021). Education at a Glance 2021: OECD Indicators. OECD Publishing. <https://doi.org/10.1787/19991487>
- Ouvrier-Bonnaz, R., & Verillon, P. (2002). Connaissance de soi et connaissance du travail dans la perspective d'une didactique de l'orientation scolaire: une approche par la coanalyse de l'activité des élèves. *Revue Française de Pédagogie*, 141. <http://www.jstor.org/stable/41201845>
- Percy, C., & Kashefpakdel, E. (2018). Social advantage, access to employers and the role of schools in modern British education. In T. Hooley, R. Sultana, & R. Thomsen (Eds.), *Career Guidance for Emancipation: Reclaiming Justice for the Multitude* (pp. 148–165.). Routledge.
- Saueremann, H., & Roach, M. (2012). Science PhD career preferences: levels, changes, and advisor encouragement. *PLoS One*, 7(e36307), doi:10.1371/journal.pone.0036307
- Savickas, M. L. (2021). Career Construction Theory and Counseling Model. In R. Lent & S. Brown (Eds.), *Career Development and Counseling: Putting Theory and Research to Work* (pp. 234-276.). John Wiley & Sons, Inc.
- Savickas, M. L., Nota, L., Rossier, J., Dauwalder, J., Duarte, M., Guichard, J., & Van Vianen, A. (2009). Life designing: A paradigm for career construction in the 21st century. *Journal of Vocational Behavior*, 75(3), <https://doi.org/10.1016/j.jvb.2009.04.004>
- Sherman, D. K., Ortosky, L., Leong, S., Kello, C., & Hegarty, M. (2021). The Changing Landscape of Doctoral Education in Science, Technology, Engineering, and Mathematics: PhD Students, Faculty Advisors, and Preferences for Varied Career Options. *Frontiers in Psychology*. 12(711615) doi: 10.3389/fpsyg.2021.711615
- Stehlik, T. (2011). Launching a career or reflecting on life? Reasons, issues and outcomes for candidates undertaking PhD studies mid-career or after retirement compared to the traditional early career pathway. *Australian journal of adult learning*. 5(December 2011)

- Templeton, R. (2021). Factors likely to sustain a mature-age student to completion of their PhD. *Australian Journal of Adult Learning*, 61(1).
- Thiry, H., Laursen, S. L., Loshbaugh, H. G. (2015). "How do i get from here to there?" An examination of Ph. D. science students' career preparation and decision making. *International Journal of Doctoral Studies*, 10(1).
- Valente, C. (2023). Ensino Superior: dois mil investigadores em fim de contrato não sabem se vão manter o emprego. *Diário de Notícias*. Accessed in: <https://www.dn.pt/sociedade/ensino-superior-dois-mil-investigadores-em-fim-de-contrato-nao-sabem-se-va-manter-o-emprego-16153393.html>
- Volkoff, S. (2011). Les éléments d'une nouvelle donne sociodémographique. In C. Gaudart & J. Thébault (Eds.), *Transmission des savoirs et mutualisation des pratiques en situation de travail* (pp. 9-18.). Centre D'Études De L'Emploi.
- WEF. (2019). Which countries have the most doctoral graduates?. <https://www.weforum.org/agenda/2019/10/doctoral-graduates-phd-tertiary-education/>
- Zhang, Z., Yu, X., and Liu, X. (2022). Do I decide my career? Linking career stress, career exploration, and future work self to career planning or indecision. *Frontiers in Psychology*, 13(997984), doi: 10.3389/fpsyg.2022.997984