

'Men are From Mars, and Women are From Venus'? Doctoral Students' Perspectives on Doctoral Education

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Abstract: Gender influences the lives of doctoral students, shaping both their doctoral experience and their views on doctoral education. Following this argument, the purpose of this paper is to investigate gender differences in students' perspectives of what doctoral education entails. The emphasis is on how and to what extent male and female students' perspectives differ in reflecting changes in doctoral education's concept, which appears to be shifting from traditional to instrumental. A study was conducted to determine how Portuguese doctoral students perceive doctoral education in terms of its structuring dimensions. The study's findings, gathered through 11 focus groups interviews with 31 doctoral students from three Portuguese public universities, five scientific fields and evenly distributed by gender, suggested that a hybrid concept of doctoral education is valued, combining elements of its traditional concept and an instrumental concept. This hybridity, and even a propensity toward a more instrumental perspective, appeared to be particularly prevalent among female doctoral students. The paper advances some explanatory hypotheses for these trends while highlighting clues for future research.

Keywords: Doctoral Education, Student perceptions, Gender differences

1. Introduction

The emergence of the 'modern University' in the nineteenth century brought the institutionalisation of what is usually known as the 'traditional' doctorate. The doctorate was entirely focused on the development of original research, tendentially based on the understanding of phenomena within a given scientific field, and the primordial relationship between 'apprentice and master' (i.e., doctoral student and supervisor), constituting a 'gateway' to an academic career (Amaral and Carvalho, 2020; Deem, 2020). This concept remained relatively unchanged, particularly in Europe, until about two to three decades ago, when a combination of factors began to induce significant changes in doctoral education, including how it is perceived and conceptualised (Cardoso et al., 2020, 2022a, 2022c). The assumption of doctoral education as a strategic resource for the knowledge society/economy stands out among these factors. Doctoral education emerges as a means for countries to increase their capacity for innovation, research, and knowledge production to strengthen their competitive position in the knowledge society/economy. Doctoral education has evolved from a purely academic issue to one of interest and intervention at the supranational, national, and even institutional levels, with the goal of aligning it with the fulfilment of new political, economic, and social expectations (Kehm, 2020; Nerad, 2014). As a result, not only in quantitative terms, but also in substantive terms, doctoral education has changed, resulting in the assumption of new objectives and configurations, indicating the emergence of new concepts about what it is (or should be). Indeed, different concepts of doctoral education coexist today, represented on a *continuum* by the previously stated traditional concept at one extreme and an instrumental concept at the other (Cardoso et al., 2022a). This instrumental concept is associated with a shorter (in length), more diverse (in terms of typologies), regulated, structured, internationalised, trans- or multidisciplinary, practice-driven, applied research, and collaborative doctoral education, where results assume more 'pragmatic' alternatives to the doctoral thesis, and supervision and training are intended to provide competencies that allow for professional development and integration outside academia. The coexistence of these concepts is clear at the level of the dimensions that structure doctoral education (see Cardoso et al., 2022a): foundations (or bases, more theory or more practise driven); objectives (more basic or more applied research); methods/rationality (more disciplinary or more multidisciplinary); expertise (more individual or more collaborative); organisation (minor/absent or major doctorates' structuring, diversification, and internationalisation); and process (minor/absent or major changes and regulation in access and recruitment, supervision, results, duration and completion, competencies, and employability).

Given this, it is important to understand how its 'recipients', i.e., doctoral students perceive doctoral education in relation to the transformations that shape its structuring dimensions and, ultimately, its concept. It is also critical to know whether students' perspectives are generalisable or susceptible to differences motivated by

factors like gender. Indeed, gender influences doctoral students' lives, shaping both their doctoral experience and their perspectives on doctoral education itself (Brown & Watson, 2010).

1.1 Gender Differences in Doctoral Education Experience and Perspectives

Despite increasing gender equity in doctoral attendance and completion, the literature indicates that doctoral female candidates' expectations, participation in, and experience with doctoral education can differ significantly from that of male candidates. Several factors are at play here, ranging from the most personal, such as individual preferences and traits, to the social and cultural, such as gender stereotypes, to the systemic and institutional, which are related to the dominant culture of the higher education system and institutions (Brown & Watson, 2010; Cardoso et al., 2022b; Carter et al., 2013; Kurtz-Costes et al., 2006).

Women face more challenges than men when pursuing doctoral education, such as the timing of the doctorate, the conflict between personal/family and academic demands, access to scientific events, or the supervisory relationship (Carter et al., 2013). Women experience more stress and conflict because of the demands and conciliation of their 'traditional' roles and studies, as well as having to deal with more complex life situations, typically related to increased childcare and family responsibilities, and frequent 'marginalisation' feelings and circumstances (Brown & Watson, 2010; Carter et al., 2013; Guest et al., 2013; Kurtz-Costes et al., 2006). Doctoral studies' pedagogic practises and regimes are recognised to be gendered, whereas institutional and departmental culture, predominantly masculine (reflecting values associated with traditional Western masculinity, such as competition, status, time commitment, high work volume), is more prone to exclude women (Brown & Watson, 2010; Carter et al., 2013; Guest et al., 2013; Ipsos MORI, 2013). Women are more likely to feel 'marginalised', or 'ignored' by this culture and unsupported by university environments (Brown & Watson, 2010). A lack or deficient 'critical mass' of women, including faculty in general and supervisors in particular, can exacerbate these feelings (Brown & Watson, 2010; Carter et al., 2013). This is especially challenging given that the doctoral socialisation process involves negotiating acceptance into the academic culture, which entails identity shifts (Carter et al., 2013) and forging a professional identity (Kurtz-Costes et al., 2006).

This framework may have a negative impact on women's doctoral pathways, including doctoral defences (Lantsoght, 2021), as well as professional and career paths, especially when pursuing a research career (Brown & Watson, 2010; Guest et al., 2013). Female candidates have a more negative perception of the doctoral defence, as well as more negative longer-term effects, and report higher levels of uneasiness and issues with defence committees (Lantsoght, 2021). Furthermore, while interest "in working at the university after receiving a PhD" appears to be "as great for women" as it is for men, "significantly fewer women" succeed (Appel & Dahlgren, 2003: 89; Guest et al., 2013; Ipsos MORI, 2013), particularly in fields such as STEM, which remain dominated by men (Cardoso et al., 2022b). Men are also more likely than women to work in non-academic research after completing their doctorates (Waaijer et al., 2016). Nonetheless, both men and women candidates tend to see doctoral work as intellectually stimulating, an opportunity for in-depth studies in a field of special interest, and meaningful, involving something important to others (Appel & Dahlgren, 2003). The freedom and flexibility involved in conducting research are also viewed positively (Appel & Dahlgren, 2003). Hence, the effects of gender are not always detrimental for women (Carter et al., 2013). This is also true when it comes to recognising the satisfaction that comes with pursuing doctoral work or the empowerment that comes with successful completion (Carter et al., 2013).

Despite the literature's important contributions to understanding how gender influences the lives and experiences of doctoral students, studies that investigate gender differences in students' perspectives and conceptions of what doctoral education entails are much rarer, and the authors were unable to identify any comprehensively. In this assumption, the paper seeks to contribute to the advancement of knowledge in this field.

2. Method

To investigate gender differences in students' perceptions of what doctoral education entails, the paper analyses the findings of a study into how Portuguese doctoral students perceive doctoral education in terms of the above-mentioned structuring dimensions (Cardoso et al., 2022a, 2022c). The goal was to learn how doctoral students portrayed doctoral education in relation to each of these dimensions, whether in a more traditional or instrumental sense. The study gathered doctoral students' perspectives through focus groups interviews with a sample of students. This sample was drawn from the doctoral programmes chosen for the study's first empirical component (N=118 programmes), which focused on the universities' perspectives on doctoral education, using the intentional sampling method and aiming for sample representativeness regarding doctoral programme

scientific fields, and universities' nature (private/public) and geographic location. Following the literature's recommendations (Silva et al., 2014; Tong et al., 2007), the number of programmes, each corresponding to a focus group, was set at 11, with a total of 55 doctoral students from three public universities¹. Due to fieldwork constraints, doctoral students' perspectives were eventually gathered through 11 focus groups interviews with a total of 31 students from the three public universities, 11 doctoral programmes in different scientific fields, and evenly distributed by gender (Table 1).

Table 1: Sample's Distribution According to Public University, Doctoral Programme, and Scientific Field, by Gender

Variable		Gender		Total
		Male	Female	
Public University/Doctoral programme				
University X	Economy	2	2	4
	Astronomy	1	0	1
	Electrical and computer engineering	3	1	4
	Public health	1	3	4
subtotal		7	6	13
University Y	Political science	2	1	3
	Nanoscience and nanotechnology	1	0	1
	Civil Engineering	1	0	1
subtotal		4	1	5
University Z	Studies on globalization	1	3	4
	Neurosciences	0	3	3
	Medieval studies	1	0	1
	Industrial engineering	2	3	5
subtotal		4	9	13
Total		15	16	31

Each of the 31 interviews was given a number that corresponded to both the interviewee and the number assigned to each focus group (for example, Interviewee 1 of Panel 1 = I1P1). The content of interviews was coded using the qualitative data processing software NVivo and a pre-defined analysis grid based on previously identified structuring dimensions of doctoral education (Cardoso et al., 2022a). Each dimension corresponded in the grid to an analysis category and respective themes: foundations; objectives; methods or rationality; expertise; organisation (including structuring, diversification, and internationalisation); and process (including access and recruitment, supervision, results, duration and completion, competencies, and employability).

Content analysis (Selvi, 2019) allowed for the systematisation and interpretation of students' perspectives about doctoral education and its different dimensions. Gender differences in these perspectives were investigated using descriptive statistics.

3. Findings

This section provides an account of the 'big' picture of Portuguese students' perspectives on what doctoral education entails in terms of its structuring dimensions and concept, as well of the 'small' picture of the gender differences in these perspectives.

¹ To ensure confidentiality, universities are referred to as X, Y, and Z.

3.1 The 'Big' Picture

Portuguese doctoral students appear to value a hybrid concept of doctoral education, as evidenced by greater proximity or distance to the traditional concept of doctoral education, as well as by the combination of aspects of this concept with an instrumental one.

A greater distance from the traditional notion of doctoral education, and thus a closer relationship to an instrumental notion, was identified particularly in relation to the methods (rationality) and expertise associated with the doctorate, all aspects related to its organisation, and some specific features of its process.

Doctoral students appeared to value a doctoral education based on inter, trans, or multidisciplinary methods or rationality, as well as a more collaborative expertise enabled by contact and integration in research groups, including those from diverse scientific backgrounds. They also agreed on the structuring of doctoral education through the inclusion of a curricular component (doctoral course) in programmes; the diversification of these programmes, through different types of doctorates other than the research doctorate; and the internationalisation of the doctorate, particularly through the integration of doctoral students in international research environments.

Furthermore, doctoral students agreed on the existence of more detailed and objective criteria and requirements for candidate access and recruitment, as well as the possibility of doctoral research results being presented in formats other than the doctoral thesis, though this was not entirely ruled out. Students, on the other hand, came closer to a traditional concept of doctoral education in terms of supervision. This was suggested by the valorisation of an individual selection of the supervisor (by the candidate), based primarily on academic attributes; the view of co-supervision as only possible if it does not overlap or replace the primordial relationship 'master/apprentice' (supervisor/candidate); the apprehension toward the possibility of co-supervision provided by experts outside academia; the inconsistency with which other than the traditional supervision models (e.g., 'master/apprentice' relationship) were mentioned (e.g., plural orientation models); and the importance placed on 'traditional' supervisory roles and functions.

Doctoral students' perspectives also revealed the presence of a doctoral education concept that combined traditional and more instrumental concepts. This integrated concept was visible in relation to the foundations and objectives of doctoral education, as well as certain aspects of its process, such as degree completion and the competencies and employability it promotes. According to doctoral students, doctoral education was (or should be) based on theoretical and practical foundations (i.e., theory and practice-driven), with an emphasis on both basic and applied research. Furthermore, the 'short' duration of doctoral programmes (e.g., 3 to 4 years) was deemed adequate, even though the degree was thought to be completed through its traditional route (i.e., by public thesis defence exams), albeit with the possibility of a jury with a different composition than the usual one (i.e., inclusion of experts from outside the academia). Doctoral education was also perceived to promote both research and additional competencies (e.g., transversal competencies), as well as professional and career opportunities both within and outside of academia.

3.2 The 'Small' Picture

Gender appeared to influence the hybridity, and even the more instrumental perspective, of doctoral education held by Portuguese doctoral students. Hybrid and more instrumental conceptions emerged as more prevalent among female doctoral students, as evidenced by their positions on the foundations, objectives, and expertise of doctoral education, as well as aspects of its organisation related to the doctorate's diversification and internationalisation, and aspects of its process, specifically those concerning doctoral research results, degree completion, and competencies.

In this context, female students made a more systematic reference to, and thus agreed more than male students, with doctoral education being based on both theoretical and practical foundations (81.3% of all females vs. 73.3% of all males); applied research or the combination of applied and basic research (87.5% of all females vs. 73.3% of all males), and collaborative expertise (75% of all females vs. 66.7% of all males) (Table 2). The following transcripts demonstrate each of the trends identified in female students' discourse:

Doctoral education, in my opinion, should be oriented toward practise. There is a need for a theoretical foundation (...), but one that leads to real-life problem solving and application, which I believe is lacking, (...). I believe the emphasis should be on practise (...). (I5P3)

The doctoral objectives must be considered, but I believe the primary focus should be on applied [research] because we already have some foundations in basic research (...). (I13P4)

The doctoral work should result from the collaboration of multiple people, and we should conduct research activities as we do [the doctorate] (...) in order to grow as researchers (...). (I8P1)

Table 2: Dimensions of Doctoral Education: Gender Differences*

Dimension of doctoral education	Gender				Dimension totals	
	Male (N=15)		Female (N=16)		(N=31)	
	N	%	N	%	N	%
Foundations: Combination of theoretical and practical foundations	11	73.3	13	81.3	24	77.4
Objectives: Applied research and combination of basic and applied research	11	73.3	14	87.5	25	80.6
Expertise: Collaborative expertise	10	66.7	12	75.0	22	70.9
Organisation/Diversification: Agreement with the diversification of doctoral education	8	53.3	10	62.5	18	58.1
Organisation/Internationalisation: Agreement with the internationalisation of doctoral education	13	86.7	15	93.8	28	90.3
Process/Access and recruitment: Greater definition, objectivity and detail of criteria and requirements for access and recruitment	14	93.3	12	75.0	26	83.9
Process/Results: Preference for thesis and/or other formats or just other formats, for the presentation of results	8	53.3	10	62.5	18	58.1
Process/Duration: Agreement with current duration (3-4 years) of doctoral education	12	80.0	8	50.0	20	64.5
Process/Completion: Diversification of the composition of the doctoral jury	7	46.7	10	62.5	17	54.8
Process/Competencies Additional competencies to those of research	5	33.3	11	68.8	16	51.6

* Percentages compared to total sample N: Male=14; Female=16; Total N=31

Female students also preferred doctorates that were more diversified (62.5% of all females vs. 53.3% of all males), i.e., included typologies other than the research doctorate, and internationalised, i.e., allowing for experiences and contact with international research contexts (93.8% of all females vs. 86.7% of all males) (Table 2). The transcripts below demonstrate these findings:

I think the variety of doctorate purposes and types is interesting. (...). The doctorate must evolve and adapt to the times, as long as the goal of knowledge generation remains constant. This, on the contrary, does not distort [the doctorate]. (I15P1)

The internationalisation (of doctoral programmes) is advantageous. (...) Having contact with other (international) contexts is beneficial because we are all studying the same area; (...) the more experiences we have from different contexts, the better, because we learn a lot. (I13P4)

Female doctoral students were also drawn to the ability to present doctoral results in various formats other than the doctoral thesis (62.5% of all females vs. 53.3% of all males); to defend the thesis before a jury even if not-strictly academic (62.5% of all females vs. 46.7% of all males); and to receive doctoral training that allowed for competencies other than research competencies (68.8% of all females vs. 33.3% of all males) (Table 2). These positions are exemplified by the following:

A doctoral thesis, in my opinion, is always appropriate, though other methods of presenting the results, such as in articles, are also appropriate (I12P2)

I support the thesis defence in front of a jury. (...) I don't think it matters whether the person (on the jury) is a member of the academy or not, as long as (the person) is focused on the area in which we are working. (...) it turns out to be (...) irrelevant whether it is a member of the academy or not (...). (I6P3)

I believe that other types of competencies, other than research, should be included in the training that is provided (...). So, I believe that other competencies, such as transversal competencies, should be included as an added value (...). There should be a set of optional curricular units where we can (...) acquire [those competencies]. (...) It would be an asset (...), and I don't believe it would distort the definition of a doctorate (...). (I15P1)

Only in two aspects of the doctoral education process, namely access and recruitment for and duration of doctorates, did male doctoral students outperform their female colleagues. Male students revealed greater preference for more well-defined, objective, and detailed criteria and requirements for candidate access and recruitment (93.3% of all males vs. 75% of all females) (Table 2). Male doctoral students were also more likely to agree with the current duration of doctoral programmes (from 3 to 4 years) and, thus, a shorter duration than what has long been associated with the doctorate (80% of all males vs. 50%). The following transcripts from male doctoral students' discourses demonstrate this:

(...) The criteria are well defined, and we submit motivation letters, recommendation letters, and final master's classifications. (...) I agree that criteria exist (and) that they must be objective and transparent. (I14P4)

I am confident that the way (...) the programmes are structured, we will be able to complete it within that time frame. Of course, this is dependent on how we plan and what we want to accomplish with our thesis. (...) But, yes, (I agree with those three years); those three years are the bare minimum; if we want to stay longer, that is up to us. (I4P3)

There were no relevant gender differences in the remaining aspects related to the dimensions of doctoral education, namely methods or rationality, structuring (organisation), supervision (process), and employability (process). As a result, differences according to gender and scientific field were not sought.

4. Discussion and Conclusions

The primary goal of the paper was to investigate gender differences in students' perceptions of what doctoral education entails, including its structuring dimensions and concept. Based on the findings, it was possible to confirm that, in terms of these perspectives, male and female students do not come from 'different planets', that is, the former 'from Mars' and the latter 'from Venus'. Indeed, there is a convergence in students' perspectives in that they value a hybrid concept of doctoral education that deviates from its traditional definition while also moving closer to an instrumental one. However, for most of the structuring dimensions of doctoral education, this concept appears to be especially prevalent among female doctoral students. In a slightly more expressive way than their male counterparts, female students value a doctoral education that is more grounded in practical foundations, applied research, or its combination with basic research, and collaborative expertise. They also agree more with a greater diversification of doctoral programmes, including doctorates other than the research doctorate; the presentation of the results of doctoral research in formats other than a thesis; the defence of doctoral work before a jury likely to be composed of non-academic members; and a doctoral training capable of providing not only research competencies but also additional competencies (e.g., transversal competencies).

Some hypotheses can be advanced to explain why female students are more likely to emphasise characteristics of the hybrid or instrumental concepts of doctoral education. One of the reasons could be an attempt by female students to get closer to a concept of doctoral education that they perceive or acknowledge as the most valued by a predominantly male academic culture (Brown & Watson, 2010; Carter et al., 2013; Guest et al., 2013). The concept of doctoral education at issue here appears to correspond to mode 2 of knowledge production, which is currently dominant and characterised by experiential, collaborative, and transdisciplinary processes (Coghlan, 2014). Multidisciplinary research is called upon in Mode 2 to work on specific real-world problems for knowledge production. The stronger tendency for female students to be more aligned with Mode 2 of knowledge production may be related to a perception of greater difficulty in entering the labour market by women with a doctoral degree, leading them to emphasise the need to transform doctoral education (Cardoso et al, 2022b; Waaijer et al., 2016).

On the other hand, valuing those concepts of doctoral education may be a manifestation of a female student's attempt to align with a doctoral education ideal that would be more favourable to or easier to pursue for them, or to facilitate their entry into a labour market outside academia. According to the literature, women may face greater obstacles (references from the paper's background) on their path to completing their doctoral studies, which they tend to approach differently than men (Bireda, 2015). In this sense, the aspects of doctoral education

that female students value more than their male counterparts may constitute the elements of an ideal doctorate that would ease such path.

Nonetheless, some preferences may be explained by additional reasons. The preference for doctoral education that provides competencies other than the research ones may be related, as other studies indicate (Bireda, 2015), to a concern about the doctorate's ability to provide competencies sought as important in the current context of knowledge production. That is the case with time management, which is regarded as essential for balancing doctoral studies with personal and social responsibilities, as well as interaction with supervisors and colleagues (Bireda, 2015). Other competencies valued by female doctoral students include "digital literacy, using research software, research and academic writing skills" (Bireda, 2015: 291).

Furthermore, the emphasis on acquiring competencies other than research competencies may be the result of increased awareness of the difficulties in entering the academic career and the resulting need for more tailored training to the needs of the job market outside of academia. Indeed, especially since the 2008 financial crisis, a more adverse academic employment environment has emerged in Portugal (Cardoso et al., 2022b). The stagnation of the higher education system, with a decrease in the need to recruit academics; the decline in institutions' need to qualify their staff (with variations across sectors and disciplines); and the closure of the academic career in terms of new hires, promotions, and replacements due to significant cuts in public funding - reduced higher education's capacity to absorb doctoral graduates, particularly new graduates (Cardoso et al., 2022b; Carvalho et al, 2022).

Finally, the preference for the presentation of the results of doctoral research in a thesis but also other formats as well as for a doctoral exam jury likely to be composed of non-academic members may be explained by the more negative feelings and attitudes female students tend to share regarding the doctoral defence (Lantsoght, 2021). However, it may also be related to the difficulties in entering the academic career as well as establishing contacts and disseminating the results of their research to other potential employers outside academia.

Although the current study adds to our understanding of how gender influences students' perspectives and conceptions of what doctoral education is (or should be), the authors believe that more research is needed. Similar studies could be conducted with doctoral students at additional universities to get the full picture, as well as studies that included other quantitative (e.g., questionnaires, scales, etc.) and qualitative methodologies (e.g., individual interviews, life stories).

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